# Spongeplant Control Program

FINAL

# Programmatic Environmental Impact Report

## Volume II

July 23, 2014

*A program for effective control of Spongeplant in the Sacramento-San Joaquin Delta and its tributaries.*

To request a copy of this report, please contact:

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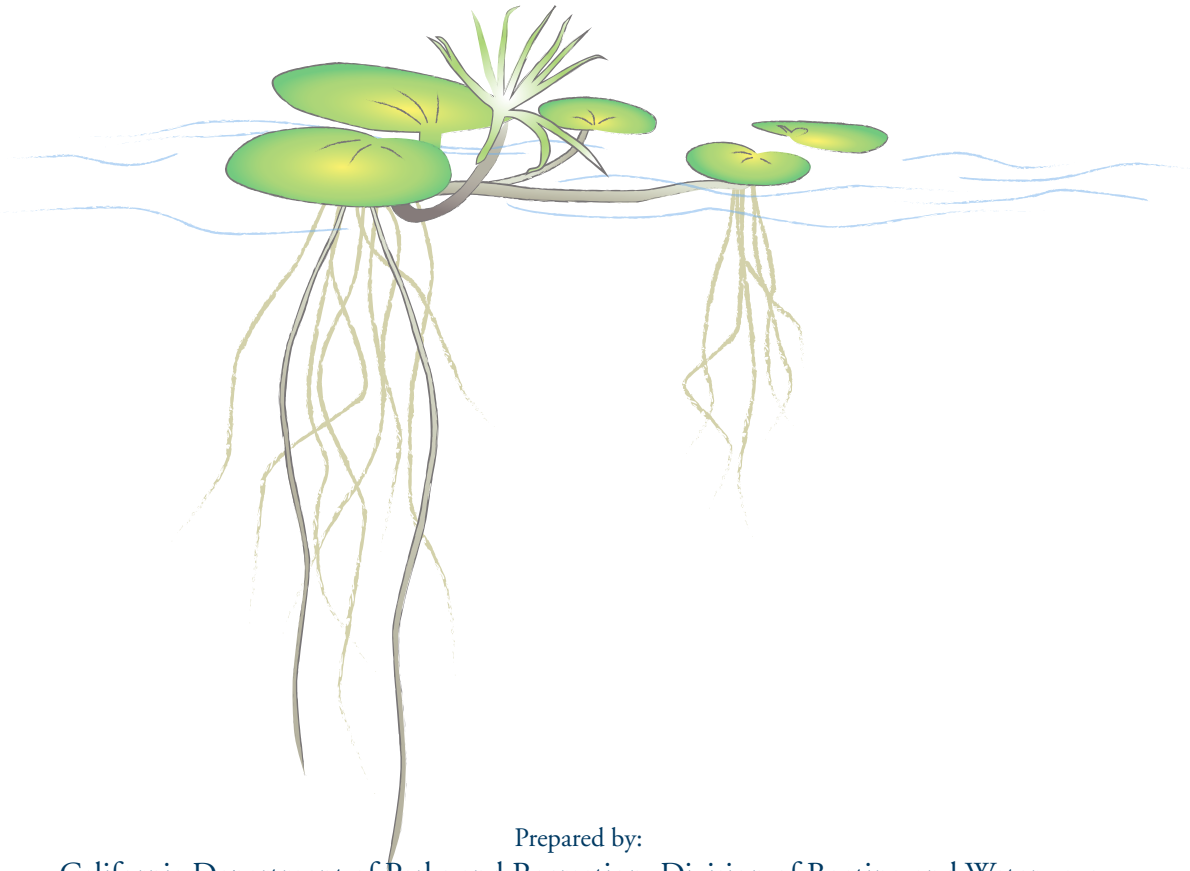
### July 23, 2014

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# Spongeplant

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## Appendix A

# SCP Permits

# Appendix A
# SCP Permits

The following pages contain SCP Permits:

- NPDES Statewide General Permit (CAG990005)
- USFWS SCP Biological Opinion (forthcoming)
- NMFS SCP Letter of Concurrence (2014-394).

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# NPDES Statewide General Permit (CAG990005)

**STATE WATER RESOURCES CONTROL BOARD**

**1001 I Street, Sacramento, California 95814**
http://www.waterboards.ca.gov/water_issues/programs/npdes/aquatic.shtml

**WATER QUALITY ORDER NO. 2013-0002-DWQ**
**GENERAL PERMIT NO. CAG990005**

# STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

The following Dischargers may apply for coverage under this General Permit in compliance with the waste discharge requirements as set forth in this General Permit:

**Table 1. Discharger Information**

| | |
|---|---|
| **Dischargers** | Any entity that discharges residual algaecides and aquatic herbicide and their degradation byproducts to waters of the United States* from algae and aquatic weed control applications. |

**Table 2. Administrative Information**

| | |
|---|---|
| This General Permit was adopted by the State Water Resources Control Board (hereinafter State Water Board) on: | **March 5, 2013** |
| This General Permit shall become effective on: | **December 1, 2013** |
| This General Permit shall expire on: | **November 30, 2018** |
| The U.S. Environmental Protection Agency (U.S. EPA) and the State Water Board have classified this discharge as a **minor** discharge. | |

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this General Permit with all attachments is a full, true, and correct copy of the General Permit adopted by the State Water Board on March 5, 2013.

AYE: Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: Chairman Charles R. Hoppin

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

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# I. DISCHARGE INFORMATION

Pesticide formulations may include "active ingredients"* and "inert ingredients."* Adjuvants* or surfactants may be added to the ingredients in the application equipment used in delivery of the pesticide. As part of the registration process of pesticides for use in California, U.S. EPA and the California Department of Pesticide Regulation (DPR) evaluate data submitted by registrants to ensure that a product used according to label instructions will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions. The Clean Water Act (CWA) section 301(a) broadly prohibits the discharge of any pollutant to waters of the United States, except in compliance with an NPDES permit. Residual pesticides* discharged into surface waters constitute pollutants within the meaning of the CWA even if the discharge is in compliance with the registration requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Therefore, coverage under an NPDES permit is required.

The discharge of algaecides and aquatic herbicides and their residues to surface waters for algae and aquatic weed control throughout the State of California may pose a threat to existing and potential beneficial uses of waters of the United States if not properly controlled and regulated.

This General Permit regulates the discharge of aquatic pesticides* (algaecides and aquatic herbicides) used for algae and aquatic weed control to waters of the United States. These are algaecides and aquatic herbicides with registration labels that explicitly allow direct application to water bodies.

# II. PERMIT COVERAGE AND APPLICATION REQUIREMENTS

## A. General Permit Coverage

Except for discharges on tribal lands that are regulated by a federal permit, this General Permit covers the point source* discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol. This General Permit covers only discharges of algaecides, and aquatic herbicides that are currently registered for use in California, or that become registered for use and contain the above-listed active ingredients and ingredients represented by the surrogate of nonylphenol.

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* An asterisk means the term is defined in Attachment A. This applies to all sections of this General permit.

This General Permit does not cover agricultural storm water discharges or return flows from irrigated agriculture because these discharges are not defined as “point sources” and do not require coverage under an NPDES permit. This General Permit also does not cover other indirect or nonpoint source discharges from applications of algaecides and aquatic herbicides, including discharges of pesticides to land that may be conveyed in storm water or irrigation runoff.

As shown in Table 1, this General Permit becomes effective on December 1, 2013. To obtain coverage under this General Permit on or after that date, Dischargers must submit their application for coverage as set forth in Section II.C below, at least 90 days prior to their first pesticide application.

## B. Discharger

A Discharger under this General Permit includes any entity involved in the application of algaecides and aquatic herbicides that results in a discharge of algaecides and aquatic herbicides and their residues and degradation byproducts to waters of the United States, and meets either or both of the following two criteria:

The entity has control over the financing for or the decision to perform algaecide and aquatic herbicide applications that result in discharges, including the ability to modify those decisions; or

The entity has day-to-day control of algaecide and aquatic herbicide applications or performs activities that are necessary to ensure compliance with this General Permit. For example, the entity is authorized to direct workers to carry out activities required by this General Permit or perform such activities themselves.

## C. General Permit Application

To obtain authorization under this General Permit, Dischargers must submit to the State Water Board a complete application that consists of the following:

1. A Notice of Intent (NOI) shown as Attachment E, signed in accordance with the signatory requirements of the Standard Provisions in Attachment B;
2. An application fee. A fee is required only for new Dischargers. Dischargersenrolled under Order No. 2004-0009-DWQ and applying for coverage under this Permit will be billed during the regular billing cycle; and
3. An Aquatic Pesticide* Application Plan (APAP).

Within 90 days of receipt of an application, the State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) will either issue a Notice of Applicability (NOA) or deny the application. The NOA will specify the permitted algaecide and aquatic herbicide active ingredients that may be used, and any region-specific conditions and requirements not stated in this General Permit. Any such region-specific conditions and requirements shall be enforceable. The Discharger is authorized to discharge starting on the date of the NOA.

Alternatively, the Deputy Director or a Regional Water Board Executive Officer may issue a Notice of Exclusion (NOE),[1] which either terminates the permit coverage or requires submittal of an application for an individual permit or alternative general permit.

### D. Fees

The fee for enrollment under this General Permit shall be based on section 2200(b)(9) category 3 of title 23, California Code of Regulations, which is available at http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl_npdes_prmt.pdf and is payable to the State Water Board.

### E. Terminating Coverage

To terminate permit coverage, a Discharger must submit a complete and accurate Notice of Termination (NOT) provided in Attachment F. The Discharger's authorization to discharge under this General Permit terminates on the day of the coverage termination letter issued by the Deputy Director. Prior to the termination effective date, the Discharger is subject to the terms and conditions of this General Permit and is responsible for submitting the annual fee and all reports associated with this General Permit.

A Discharger must submit an NOT when one of the following conditions occurs:

1. A new operator has taken over responsibility of the Discharger's algae or aquatic weed control activities covered under an existing NOA;
2. The Discharger has ceased all discharges from the application of algaecides and aquatic herbicide for which it obtained General Permit coverage and does not expect to discharge during the remainder of this General Permit term; or
3. The Discharger has obtained coverage under an individual permit or an alternative general permit for all discharges required to be covered by an NPDES permit.

## III. FINDINGS

The Fact Sheet (Attachment D), which contains the background information and rationale for the requirements in this General Permit, is hereby incorporated into this General Permit and constitutes its findings. All other attachments (A, B, C, and E through G) are also incorporated into this General Permit.

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[1] An NOE is a one-page notice that indicates and justifies why the Discharger or proposed Discharger is not eligible for coverage under this General Permit and states the reason why. This justification can include, but is not limited to, necessity to comply with a total maximum daily load or to protect sensitive water bodies. The NOE can also indicate that the coverage is denied if feasible alternatives to the selected pesticide application project are not analyzed.

THEREFORE, IT IS HEREBY ORDERED that this General Permit supersedes Order No. 2004-0009-DWQ except for enforcement purposes, and in order to meet the provisions contained in division 7 of the Water Code (commencing with §13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

## IV. DISCHARGE PROHIBITIONS

A. The discharge of residual algaecides and aquatic herbicides in a manner different from that described in this General Permit is prohibited.

B. The discharge of residual algaecides and aquatic herbicides shall not create a nuisance as defined in section 13050 of the California Water Code.

C. The discharge shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable standard or criterion promulgated by U.S. EPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or Regional Water Boards.

D. All pesticides are prohibited from the waters of the Lahontan Region (Region 6). The use of this permit is invalid in the Lahontan Region unless the discharger has requested a prohibition exemption from the Lahontan Water Board and the Lahontan Water Board has granted an exemption for the use of algaecides or aquatic herbicides.

## V. EFFLUENT LIMITATIONS

A. The discharge of residual algaecides and aquatic herbicides must meet applicable water quality standards; and

B. Dischargers shall implement Best Management Practices (BMPs) when applying aquatic algaecides and aquatic herbicides. The BMPs must be provided in the APAP which is described in Section VIII.C below.

## VI. RECEIVING WATER LIMITATIONS

The discharge shall not result in any of the following:

A. The discharge of residual algaecides and aquatic herbicides shall not cause or contribute to an exceedance of the following limitations in the receiving water:*

## Table 3. Receiving Water Limitations

| Constituent/ Parameter | BENEFICIAL USE[1] | | | | Basis |
|---|---|---|---|---|---|
| | MUN, µg/L | WARM or COLD, µg/L | Other than MUN, WARM, or COLD, µg/L | All Designations | |
| 2,4-D | 70 | | | | U.S. EPA MCL |
| Acrolein[2] | 320 | 21 | 780 | | U.S. EPA Water Quality Criteria, 1986. |
| Copper[2] | | | | Dissolved Freshwater[3]<br>Copper Chronic = 0.960exp{0.8545 [ln(hardness[4])] – 1.702} [5, 6]<br><br>Dissolved saltwater[3]<br>Copper Chronic = 0.83exp{0.8545 [ln(hardness[4])] – 1.702} [5,6] | California Toxics Rule |
| Diquat | 20 | | | | U.S. EPA MCL |
| Endothall | 100 | | | | U.S. EPA MCL |
| Fluridone | 560 | | | | U.S. EPA Integrated Risk Information System |
| Glyphosate | 700 | | | | U.S. EPA MCL |
| Nonylphenol | | | | Freshwater Chronic Criterion = 6.6 µg/L<br><br>Saltwater Chronic Criterion = 1.7 µg/L | U.S. EPA National Recommended Ambient Water Quality Criteria |
| Toxicity | Algaecide and aquatic herbicide applications shall not cause or contribute to toxicity in receiving water(s). | | | | Regional Water Boards' Basin Plans |

Notes:
1. See Regional Water Boards' Water Quality Control Plans (Basin Plans) for beneficial use definitions.
2. Public entities and mutual water companies* listed in Attachment G are not required to meet these limitations in receiving waters during the exception period described in the APAP and Section VIII.C.10 below.
3. For waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the freshwater criteria apply. For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, saltwater criteria apply. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria.
4. For freshwater aquatic life criteria, waters with a hardness 400 mg/L or less as calcium carbonate, the actual ambient hardness of surface water shall be used. For waters with a hardness of over 400 mg/L as calcium carbonate, a hardness of 400 mg/L as calcium carbonate shall be used with a default Water-Effect Ratio of 1.
5. Values should be rounded to two significant figures.
6. This limitation does not apply to the Sacramento River and its tributaries above the State Highway 32 Bridge at Hamilton City. See Table III-1 of the Basin Plan for the Sacramento and San Joaquin River Basins for copper limitation.

B. **Dissolved Oxygen.** Dissolved oxygen to be below the Regional Water Board Basin Plans' dissolved oxygen objectives for the receiving water.

C. **Floating Material.** Floating material to be present in the amounts that cause nuisance or adversely affect beneficial uses.

D. **Settleable Substances.** Settleable substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

E. **Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

F. **Taste and Odors.** Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses or domestic or municipal water supplies.

G. **Toxic Pollutants.** Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

H. **Color.** Esthetically undesirable discoloration.

I. **Aquatic Communities.** Aquatic communities and populations, including vertebrates, invertebrates, and non-target plant species to be degraded.

## VII. RECEIVING WATER MONITORING TRIGGERS

In the absence of Receiving Water Limitations, the Receiving Water Monitoring Triggers shown in Table 4 below will be used to assess compliance with the narrative receiving water toxicity limitation. However, exceeding the monitoring trigger does not constitute a violation of this General Permit as long as the Discharger performs the following actions: (1) initiates additional investigations for the cause of the exceedance; (2) implements additional BMPs to reduce the algaecide and aquatic herbicide residue concentration to be below the monitoring triggers in future applications; and (3) evaluates the appropriateness of using alternative products.

**Table 4. Receiving Water Monitoring Triggers**

| Ingredient | Unit | Instantaneous Maximum Monitoring Trigger | Basis |
|---|---|---|---|
| Imazapyr | mg/L | 11.2 | U.S. EPA Office of Pesticides *Ecotoxicity Database* |
| Triclopyr Triethylamine | mg/L | 13.0 | U.S. EPA Office of Pesticides *Ecotoxicity Database* |

## VIII. AQUATIC PESTICIDE USE REQUIREMENTS

### A. Application Schedule

The Discharger shall provide a phone number or other specific contact information to all persons who request the Discharger's application schedule. The Discharger shall provide the requester with the most current application schedule and inform the requester if the schedule is subject to change. Information may be made available by electronic means, including posting prominently on a well-known website.

### B. Public Notice Requirements

Every calendar year, at least 15 days prior to the first application of algaecide or aquatic herbicide, the Discharger shall notify potentially affected public agencies. The Discharger shall post the notification on its website if available. The notification shall include the following information:

1. A statement of the discharger's intent to apply algaecide or aquatic herbicide(s);
2. Name of algaecide and aquatic herbicide(s);
3. Purpose of use;
4. General time period and locations of expected use;
5. Any water use restrictions or precautions during treatment; and
6. A phone number that interested persons may call to obtain additional information from the Discharger.

### C. Aquatic Pesticides Application Plan (APAP)

Dischargers shall submit an APAP at least 90 days before the expected day of permit coverage. The APAP shall contain, but not be limited to, the following elements sufficient to address each proposed treatment area:*

1. Description of the water system to which algaecides and aquatic herbicides are being applied;
2. Description of the treatment area in the water system;
3. Description of types of weed(s) and algae that are being controlled and why;
4. Algaecide and aquatic herbicide products or types of algaecides and aquatic herbicides expected to be used and if known their degradation byproducts, the method in which they are applied, and if applicable, the adjuvants and surfactants used;
5. Discussion of the factors influencing the decision to select algaecide and aquatic herbicide applications for algae and weed control;
6. If applicable, list the gates or control structures to be used to control the extent of receiving waters potentially affected by algaecide and aquatic herbicide application and provide an inspection schedule of those gates or control structures to ensure they are not leaking;
7. If the Discharger has been granted a short-term or seasonal exception under State Water Board *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays,* and Estuaries of California* (Policy) section 5.3 from meeting acrolein and copper receiving water limitations, provide the beginning and ending dates of the exception period, and justification for the needed time for the exception. If algaecide and aquatic herbicide applications occur outside of the exception period, describe plans to ensure that receiving water criteria are not exceeded because the Dischargers must comply with the

acrolein and copper receiving water limitations for all applications that occur outside of the exception period;

8. Description of monitoring program;
9. Description of procedures used to prevent sample contamination from persons, equipment, and vehicles associated with algaecide and aquatic herbicide application;
10. Description of the BMPs to be implemented. The BMPs shall include, at the minimum:
    a. Measures to prevent algaecide and aquatic herbicide spill and for spill containment during the event of a spill;
    b. Measures to ensure that only an appropriate rate of application consistent with product label requirements is applied for the targeted weeds or algae;
    c. The Discharger's plan in educating its staff and algaecide and aquatic herbicide applicators on how to avoid any potential adverse effects* from the algaecide and aquatic herbicide applications;
    d. Discussion on planning and coordination with nearby farmers and agencies with water rights diversion so that beneficial uses of the water (irrigation, drinking water supply, domestic stock water, etc.) are not impacted during the treatment period; and
    e. A description of measures that will be used for preventing fish kill when algaecides and aquatic herbicides will be used for algae and aquatic weed controls.
11. Examination of Possible Alternatives. Dischargers should examine the alternatives to algaecide and aquatic herbicide use to reduce the need for applying algaecides and herbicides. Such methods include:
    a. Evaluating the following management options, in which the impact to water quality, impact to non-target organisms including plants, algaecide and aquatic herbicide resistance, feasibility, and cost effectiveness should be considered:
        i. No action;
        ii. Prevention;
        iii. Mechanical or physical methods;
        iv. Cultural methods;
        v. Biological control agents; and
        vi. Algaecides and aquatic herbicides;

        If there are no alternatives to algaecides and aquatic herbicides, Dischargers shall use the minimum amount of algaecides and aquatic herbicides that is necessary to have an effective control program and is consistent with the algaecide and aquatic herbicide product label requirements.

b. Using the least intrusive method of algaecide and aquatic herbicide application; and

c. Applying a decision matrix concept to the choice of the most appropriate formulation.

## D. APAP Processing, Approval, and Modifications

Upon receipt of an APAP, staff will post it on the State Water Board's website for a 30-day public comment period[2] and will distribute a notice via the State Water Board's Lyris list that an APAP has been posted. Staff will coordinate with Regional Water Board staff in reviewing the application package for completeness and applicability to this General Permit. If no comments are received and State and Regional Water Board staff deem the APAP complete, the Deputy Director will issue an NOA within five (5) working days of closure of the comment period. If comments are received, staff will work with Regional Water Board staff and the Discharger to address the comments to allow the Deputy Director to issue an NOA as expeditiously as possible. Permit coverage will begin when the Discharger receives the NOA.

Major changes to the APAP shall be submitted to the Deputy Director for approval. Examples of major changes include using a different product other than what is specified in the APAP, changing an application method that may result in different amounts of pesticides being applied, or adding or deleting BMPs.

## E. Algaecide and Aquatic Herbicide Application Log

The Discharger shall maintain a log for each algaecide and aquatic herbicide application. The application log shall contain, at a minimum, the following information:

1. Date of application;
2. Location of application;
3. Name of applicator;
4. Type and amount of algaecide and aquatic herbicide used;
5. Application details, such as flow and level of water body, time application started and stopped, algaecide and aquatic herbicide application rate and concentration;
6. Visual monitoring assessment; and
7. Certification that applicator(s) followed the APAP.

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[2] See Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486 (2nd Cir. 2005).

# IX. PROVISIONS

## A. Standard Provisions

1. All Dischargers authorized to discharge under this General Permit shall comply with the Federal Standard Provisions included in Attachment B of this General Permit.
2. This General Permit does not authorize the discharge of residual algaecides and aquatic herbicides or their degradation byproducts to waters of the United States that are impaired by the active ingredient of the algaecides and herbicides used. Impaired waters are those waters not meeting water quality standards pursuant to section 303(d) of the CWA. California impaired waters are listed on: http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls.
3. This General Permit does not authorize any take of endangered species. The discharge is prohibited from adversely impacting biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or state endangered species laws. To ensure that endangered species issues are raised to the responsible agencies, the State Water Board has notified the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Wildlife of this General Permit.
4. The State Water Board may use this General Permit to regulate the discharge of algaecides and aquatic herbicides and their residues to a surface water classified as Outstanding National Resource Waters or as a water body impaired by unknown toxicity only after the following conditions are satisfied: (1) the proposed project will comply with the limitations and discharge requirements specified in the General Permit; and (2) if required, the proposed algaecide and aquatic herbicide application qualifies for and has been granted a Basin Plan prohibition exception prior to discharge. The two bodies of water that are classified as Outstanding National Resource Waters in California are Lake Tahoe and Mono Lake.
5. The Discharger must follow all FIFRA pesticide label instructions and any Restricted Material Use Permits issued by a County Agricultural Commissioner.
6. All adjuvants used with the algaecides and aquatic herbicides must be labeled for aquatic use.
7. The Discharger must comply with effluent and receiving water limitations and must develop and implement an APAP.
8. To reduce the potential impacts to water quality, Dischargers shall implement the feasible alternatives to algaecide and aquatic herbicide use that are identified in the APAP.
9. All Dischargers authorized to discharge under this General Permit shall comply with discharge prohibitions and other requirements contained in Basin Plans, as implemented by the State and the nine Regional Water Boards.

10. All Dischargers authorized to discharge under this General Permit shall comply with the following provisions:
    a. After notice and opportunity for a hearing, this General Permit may be terminated or modified for cause, including, but not limited to:
        i. Violation of any term or condition contained in this General Permit;
        ii. Obtaining this General Permit by misrepresentation or by failing to disclose fully all relevant facts;
        iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and
        iv. A material change in the character, location, or volume of discharge (if applicable).
    b. The provisions of this General Permit are severable. If any provision of this General Permit is found invalid, the remainder of this General Permit shall not be affected.
    c. The Discharger shall maintain a copy of this General Permit and make it available at all times to operating personnel. Key operating personnel shall be familiar with its content.
    d. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the State and Regional Water Boards.
    e. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated based on manufacturer's recommendations to ensure their continued accuracy.
    f. Each Discharger shall file with the State Water Board and the appropriate Regional Water Board technical reports on self monitoring* performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this General Permit.
    g. The State and Regional Water Board are authorized to enforce the terms of this General Permit under provisions of the California Water Code, including, but not limited to, sections 13385, 13386, and 13387.

## B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment C of this General Permit.

## C. Special Provisions

### 1. Reopener Provisions

This General Permit may be reopened for modification and reissuance in accordance with the provisions contained in title 40 Code Federal Regulation (40 C.F.R.) section 122.62, and for the following reasons:

a. **Addition to the Public Entity List**. This General Permit may be reopened to modify Attachment G if any additional entity becomes qualified for a Policy section 5.3 exception.

b. **Addition of Aquatic Pesticide Active Ingredients**. This General Permit may be reopened to add additional algaecide and aquatic herbicide active ingredients if new active ingredients are registered by U.S. EPA and DPR.

c. **Acute and Chronic Toxicity.** If the State Water Board revises the Policy toxicity control provisions that would require new implementation procedures including the establishment of numeric chronic toxicity limitations, this General Permit may be reopened to include numeric acute and/or chronic toxicity receiving water limitations based on the new provisions.

d. **Receiving Water Limitations.** This General Permit may be reopened to add numeric Receiving Water Limitations for the residual algaecide and aquatic herbicides* exceeding the triggers if the additional investigation results show necessary.

e. **Endangered Species Act**. If U.S. EPA develops biological opinions regarding algaecides and aquatic herbicides included in this General Permit, this General Permit may be re-opened to add or modify Receiving Water Limitations/Monitoring Triggers for aquatic herbicides and algaecides and their residues of concern, if necessary.

2. **Change of Discharger**

In the event of any change in the Discharger that has obtained coverage under this General Permit, the previous Discharger shall notify the new Discharger of the existence of this General Permit by letter. A copy of the letter shall be immediately forwarded to the Deputy Director. After receipt of the letter, the Deputy Director will terminate the permit coverage to the previous Discharger. The new Discharger shall complete and submit to the Deputy Director a revised NOI form (Attachment E), and any revisions to the APAP prepared by the previous control entity or a new APAP.

3. **Application Package**

Dischargers who seek coverage under this General Permit shall file a complete application package at least 90 days before the expected date of algaecide and aquatic herbicide application. The application package shall include an NOI, APAP, and application fee. Enrolled Dischargers will be billed annually thereafter.

4. **Special Studies, Technical Reports, and Additional Monitoring Requirements**

a. **Additional Investigation**

Each Discharger must conduct additional investigations when the chemical monitoring shows exceedance of any receiving water limitation or monitoring trigger. The additional investigations shall identify corrective actions to

eliminate exceedance of receiving water limitations or monitoring triggers caused by the algaecide and aquatic herbicide application. The investigation shall include, but not be limited to evaluating the need to implement one or more of the following actions: revising and improving the existing BMPs, revising the mode of application, using less toxic algaecide and aquatic herbicide products, or selecting alternative methods for algae and aquatic weed control.

b. **Qualified Biologist Certification Following Project Completion**

Upon completion of an algaecide and aquatic herbicide project, public entities and mutual water companies listed in Attachment G of this General Permit shall provide certification by a qualified biologist* that beneficial uses of receiving waters have been restored.

5. **Corrective Action**

a. **Exceedance of Receiving Water Limitations or Monitoring Triggers.**

If a Receiving Water Limitation in Table 3 or a Monitoring Trigger in Table 4 is exceeded in the Event or Post-Event sample, the Discharger shall perform the following actions: (1) initiate additional investigations for the cause of the exceedance, (2) implement appropriate BMPs to reduce the algaecide and aquatic herbicide concentration to be below the applicable receiving water limitation or monitoring triggers in future applications, and (3) evaluate the appropriateness of using alternative products.

b. **Revision of Control Measures.**

If any of the following situations occur, the Discharger must review and, as necessary, revise the evaluation and selection of the control measures to ensure that the situation is eliminated and will not be repeated in the future:

i. An unauthorized release or discharge associated with the application of algaecides and aquatic herbicides (e.g., spill, leak, or discharge not authorized by this or another NPDES permit) occurs;

ii. The Discharger becomes aware, or the State Water Board concludes, that the control measures are not adequate/sufficient for the discharge to meet applicable water quality standards;

iii. Any monitoring activities indicate that the Discharger failed to:

a) Follow the label instructions for the product used;

b) Use the minimum amount of algaecide and aquatic herbicide product per application and optimum frequency of algaecide and aquatic herbicide applications that are necessary for an effective control program consistent with reducing the potential for development of resistance and the algaecide and aquatic herbicide product label requirements;

c) Perform regular maintenance activities to reduce leaks, spills, or other unintended discharges of algaecides and aquatic herbicides

associated with the application of algaecides and aquatic herbicides covered under this General Permit; or

d) Maintain algaecide and aquatic herbicide application equipment in proper operating condition by adhering to any manufacturer's conditions and industry practices, and by calibrating, cleaning, and repairing such equipment on a regular basis to ensure effective algaecide and aquatic herbicide application and algae and aquatic weed control. The Discharger must ensure that the equipment's rate of algaecide and aquatic herbicide application is calibrated to deliver the minimum quantity of algaecides and aquatic herbicides that is needed to have an effective control program and is consistent with the algaecide and aquatic herbicide product label requirements.

c. **Corrective Action Deadlines**

If the Discharger determines that changes to the control measures are necessary to eliminate any situation identified above, the Discharger shall make such changes within 60 days. The Discharger shall take the corrective action before any further discharge of the algaecides and aquatic herbicides and their residues will be allowed.

d. **Effect of Corrective Action**

The occurrence of a situation identified in Section C.5.b above may constitute a violation of this General Permit. Correcting the situation according to Corrective Action Section C.5.c above does not absolve the Discharger of liability for any original violation. However, failure to comply with any Corrective Action as required by Section C.5.c above constitutes an additional permit violation. The State and Regional Water Boards will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

The State Water Board and the appropriate Regional Water Boards may impose additional requirements and schedules of compliance, including requirements to submit additional information concerning the condition(s) triggering corrective action or schedules and requirements more stringent than specified in this General Permit. Those requirements and schedules will supersede those in the Corrective Action Section above if such requirements conflict.

6. **Adverse Incident to Threatened or Endangered Species or Critical Habitat**

If the Discharger becomes aware of an adverse incident* to a federally-listed threatened or endangered species or its federally-designated critical habitat, that may have resulted from the Discharger's algaecides and aquatic herbicides application, the Discharger must immediately notify the National Marine Fisheries Service (NMFS) Santa Rosa office by phone at (707) 575-6050 in the case of an anadromous or marine species, or the U.S. Fish and Wildlife Service (FWS) at (916) 414-6600 in the case of a terrestrial or freshwater species. This notification must be made by telephone immediately when the Discharger becomes aware of the adverse incident and must include at least the following information:

a. The caller's name, telephone number, and e-mail address;

b. Applicator name and mailing address;

c. The name of the affected species;

d. How and when the Discharger became aware of the adverse incident;

e. Description of the location of the adverse incident;

f. Description of the adverse incident, including the U.S. EPA pesticide registration number for each product applied in the area of the adverse incident; and

g. Description of any steps that have been taken or will be taken to alleviate the adverse impact to the species.

Additional information on federally-listed threatened or endangered species and federally-designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species.

## X. COMPLIANCE DETERMINATION

Compliance with receiving water limitations and monitoring triggers shall be determined through event and post-event monitoring results.

# Attachment A – Definitions

**Active Ingredient**
Active ingredients are ingredients disclosed by manufacturers that yield toxic effects* on target organisms.

**Adjuvants**
Adjuvants are ingredients that are mixed with herbicides prior to an application event and are often trade secrets. These ingredients are chosen by the Discharger, based on site characteristics, and typically increase the effectiveness of pesticides on target organisms.

**Adverse Incident**
Adverse Incident means a situation where the Discharger observes upon inspection or becomes aware of in which**:**

- A person or non-target organism may have been exposed to an algaecide or aquatic herbicide residue; and
- The person or non-target organism suffered an adverse or toxic effect.

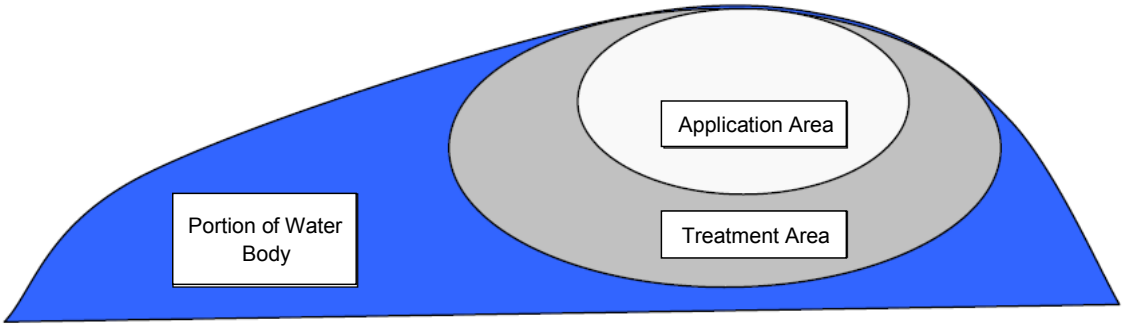
**Adverse or Toxic Effect**
An "adverse or toxic effect" includes any impact that occurs within waters of the United States on non-target organisms as a result of algaecide or aquatic herbicide residue discharge. Examples of these effects may include:

- Distressed or dead juvenile and small fishes
- Washed up or floating fish
- Fish swimming abnormally or erratically
- Fish lying lethargically at water surface or in shallow water
- Fish that are listless or nonresponsive to disturbance
- Stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants
- Other dead or visibly distressed non-target aquatic organisms (amphibians, turtles, invertebrates, etc.)

An "adverse or toxic effect" also includes any adverse effects to humans (e.g., skin rashes) or domesticated animals that occur either directly or indirectly from a discharge to waters of the United States that are temporally and spatially related to exposure to an algaecide and aquatic herbicide residue (e.g., vomiting, lethargy).

**Algae Control**
Algae control means the treatment of filamentous algae, cyanobacteria (blue-green algae), or algal species that have the potential to affect human or environmental health.

**Application Area**
The application area is the area to which aquatic pesticides are directly applied.




**Application Event**
The application event is the time that introduction of the algaecide or aquatic herbicide to the treatment area takes place, not the length of time that the environment is exposed to the algaecide or aquatic herbicide.

**Aquatic Pesticides**
Aquatic pesticides in this General Permit are limited to algaecides and aquatic herbicides labeled for aquatic use to control aquatic weeds or algae.

**Beneficial Uses**
Beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

**Coalition**
Specifically refers to a monitoring coalition which is a collaborative monitoring partnership of dischargers to develop a monitoring plan that addresses the monitoring requirements of this General Permit. The Coalition's monitoring plan will be submitted for Coalition members in lieu of individual monitoring plans from each member.

**Enclosed Bays**
Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

**Estuaries**
Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of freshwater and seawater. Estuaries do not include inland surface waters or ocean waters.

**Half-Life**
Half-life is the time required for half of the compound introduced into an ecosystem to be eliminated or disintegrated by natural processes.

**Inert Ingredients**
Inert ingredients are additional ingredients and are often trade secrets; therefore, they are not always disclosed by the manufacturer.

**Mutual Water Company**
A mutual water company is defined in the Public Utilities Code, section 2725 as “[a]ny private corporation or association organized for the purpose of delivering water to its stockholders and members at cost, including use of works for conserving, treating, and reclaiming water."

**Point Source**
Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, or vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

**Priority Pollutants**
Priority pollutants are listed within the California Toxics Rule in 40 Code of Federal Regulations, section 131.38(b)(1). Criteria to protect aquatic life and human health are set for priority pollutants in the California Toxics Rule.

**Public Entity**
Public entity includes the federal government or a state, county, city and county, city, district, public authority, or public agency.

**Qualified Biologist**
A qualified biologist is a biologist who has the knowledge and experience in the ecosystem where the algaecide or aquatic herbicide is applied so that he or she can adequately evaluate whether the beneficial uses of the receiving waters have been protected and/or restored upon completion of the algaecide and aquatic herbicide application project.

**Receiving Waters**
Receiving waters are waters of the United States anywhere outside of the treatment area at anytime and anywhere inside the treatment area after completion of the treatment event.

**Representative Monitoring Location**
To be considered “representative,” at a minimum, a location must be similar in hydrology, algaecide or aquatic herbicide use, and other factors that affect the residual discharge to the areas being represented in that environmental setting.

**Residual Algaecide and Aquatic Herbicide**
Residual algaecide and aquatic herbicide are those portions of the pesticides that remain in

the water after the application and its intended purpose (injury or elimination of targeted pests) have been completed.

**Self Monitoring**
Sampling and analysis performed by the Discharger or Coalition to determine compliance with the Permit. All laboratory analyses must be conducted by a laboratory certified by the California Department of Public Health.

**Treatment Area**
The treatment area is the area being treated by the algaecide or aquatic herbicide for algae and aquatic weed control and, therefore, the area being targeted to receive an appropriate rate of application consistent with product label requirements of algaecide or aquatic herbicide. It is the responsibility of the Discharger to define the treatment area for each specific algaecide and aquatic herbicide application.

**Waters of the United States**
1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters, including interstate “wetlands;”
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
   a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
   b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   c. Which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in items1 through 4 of this definition;
6. The territorial sea; and
7. "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. section 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States [See Note 1 of this Section.] Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with U.S. EPA.

## Attachment B – Standard Provisions

## I. STANDARD PROVISIONS – PERMIT COMPLIANCE (IF APPLICABLE)

### A. Duty to Comply

1. The Discharger must comply with all of the conditions of this General Permit. Any noncompliance constitutes a violation of the CWA and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. §122.41(a).)
2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement. (40 C.F.R. §122.41(a)(1).)

### B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit. (40 C.F.R. §122.41(c).)

### C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this General Permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. §122.41(d).)

### D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. (40 C.F.R. §122.41(e).)

### E. Property Rights

1. This General Permit does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. §122.41(g).)
2. The issuance of this General Permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. §122.5(c).)

### F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (U.S. EPA), and/or their authorized

representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, (40 C.F.R. §122.41(i); Water Code, §13383) to:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this General Permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Permit;
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Permit; and
4. Sample or monitor, at reasonable times, for the purposes of assuring General Permit compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location.

## II. STANDARD PROVISIONS – PERMIT ACTION

### A. General

This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any General Permit condition. (40 C.F.R. §122.41(f).)

### B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this General Permit after the expiration date of this General Permit, the Discharger must apply for and obtain authorization as required by the new permit. (40 C.F.R. §122.41(b).)

### C. Transfers

This General Permit is not transferable to any person except after notice to the State Water Board. The State Water Board may require modification or revocation and reissuance of the General Permit to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. §122.41(l)(3); §122.61.)

### D. Continuation of this Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 C.F.R. section 122.6 and remain in full force and effect.

## III. STANDARD PROVISIONS – MONITORING

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. §122.41(j)(1).)

Monitoring results must be conducted according to test procedures under 40 C.F.R. part 136 unless other test procedures have been specified in this General Permit. (40 C.F.R. §122.41(j)(4); §122.44(i)(1)(iv).)

## IV. STANDARD PROVISIONS – RECORDS

### A. Records Retention

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this General Permit, and records of all data used to complete the application for this General Permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the the State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) at any time. (40 C.F.R. §122.41(j)(2).)

### B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. §122.41(j)(3)(i).);
2. The individual(s) who performed the sampling or measurements (40 C.F.R. §122.41(j)(3)(ii).);
3. The date(s) analyses were performed (40 C.F.R. §122.41(j)(3)(iii).);
4. The individual(s) who performed the analyses (40 C.F.R. §122.41(j)(3)(iv).);
5. The analytical techniques or methods used (40 C.F.R. §122.41(j)(3)(v).); and
6. The results of such analyses. (40 C.F.R. §122.41(j)(3)(vi).)

### C. Claims of confidentiality for the following information will be denied (40 C.F.R. §122.7(b).):

1. The name and address of any permit applicant or Discharger (40 C.F.R. §122.7(b)(1).); and
2. Permit applications and attachments, permits and effluent data. (40 C.F.R. §122.7(b)(2).)

## V. STANDARD PROVISIONS – REPORTING

### A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the Regional Water Board, State Water Board, or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this General Permit or to determine compliance with this General Permit. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this General Permit. (40 C.F.R. §122.41(h); Wat. Code, §13267.)

## B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, V.B.5, and V.B.6 below. (40 C.F.R. §122.41(k).)

2. **For a corporation.** By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who perfoms similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

3. **For a partnership or sole proprietorship.** By a general partner or the proprietor, respectively;

4. **For a municipality, state, federal, or other public agency:** All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 C.F.R. §122.22(a)(3).)

5. All reports required by this General Permit and other information requested by the Regional Water Board, State Water Board, or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.1 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

    a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.1 above (40 C.F.R. §122.22(b)(1).);

    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity or an individual or a position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. §122.22(b)(2).); and

    c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. §122.22(b)(3).)

6. If an authorization under Standard Provisions – Reporting V.B.1 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.1 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. §122.22(c).)

   Any person signing a document under Standard Provisions – Reporting V.B.1 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. §122.22(d).)

**C. Monitoring Reports**

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment C) in this General Permit. (40 C.F.R. §122.22(l)(4).)
2. Monitoring results must be reported on a Self Monitoring* Report (SMR) form as agreed to by the Deputy Director and the Discharger.
3. If the Discharger monitors any pollutant more frequently than required by this General Permit using test procedures approved under 40 C.F.R part 136 or as specified in this General Permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the SMR or a reporting form specified by the State Water Board. (40 C.F.R. §122.41(l)(4)(ii).)
4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this General Permit. (40 C.F.R. §122.41(l)(4)(iii).)

**D. Compliance Schedules**

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this General Permit, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. §122.41(l)(5).)

**E. Planned Changes**

The Discharger shall give notice to the State and the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted activity or discharge. Notice is required under this provision (40 C.F.R. §122.41(l)(1)) only when

the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this General Permit nor to notification requirements under 40 C.F.R. section 122.42(a)(1).

### F. Anticipated Noncompliance

The Discharger shall give advance notice to the State and Regional Water Boards of any planned changes in the permitted discharge or activity that may result in noncompliance with General Permit requirements. (40 C.F.R. §122.41(l)(2).)

### G. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.F above. (40 C.F.R. §122.41(l)(7).)

### H. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the State Water Board, Regional Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. §122.41(l)(8).)

## VI. STANDARD PROVISIONS – ENFORCEMENT

The State and the Regional Water Boards are authorized to enforce the terms of this General Permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

# Attachment C – Monitoring and Reporting Program

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# ATTACHMENT C – MONITORING AND REPORTING PROGRAM

Section 122.48 of title 40 of the Code of Federal Regulations (40 C.F.R. §122.48) requires that all NPDES permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the State Water Resources Control Board (the State Water Board) and the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements which implement federal and California State laws and regulations.

This MRP is designed to address the two key questions shown below. It also encourages Dischargers to form monitoring coalitions with others doing similar applications within a given watershed or doing applications of similar environmental settings (flowing water and non-flowing water). The Coalition or Discharger may select sites representing worst case scenarios or high-use areas for each active ingredient in each environmental setting. If the Discharger elects in its Aquatic Pesticide Application Plan (APAP) to undertake monitoring and reporting through a Coalition, then the Coalition will prepare and implement an MRP (pursuant to this Attachment C) and act on behalf of the Discharger with respect to monitoring and reporting. Otherwise, the Discharger will prepare and implement an individual MRP.

**Question No. 1:** Does the residual algaecides and aquatic herbicides discharge cause an exceedance of receiving water limitations?

**Question No. 2:** Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, inert ingredients, and degradation byproducts, in any combination cause or contribute to an exceedance of the “no toxics in toxic amount” narrative toxicity objective?

If the Discharger elects in its APAP to undertake monitoring and reporting through a Coalition, the APAP should reference and attach the Coalition’s monitoring plan.

## I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the nature of the monitored discharge. All samples shall be taken at the anticipated monitoring locations specified in the Discharger’s or Coalition’s APAP.

B. All laboratory analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with California Water Code section 13176. Laboratories that perform sample analyses shall be identified in all monitoring reports. The Discharger shall institute a Quality Assurance-Quality Control Program for any onsite field measurements such as electric conductivity, pH, turbidity, and temperature. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by the State Water Board and the appropriate Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to United States Environmental Protection Agency (U.S. EPA) guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board.

C. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants," promulgated by the U.S. EPA in title 40 Code Federal Regulation (40 C.F.R.) 136 or equivalent methods that are commercially and reasonably available and that provide quantification of sampling parameters and constituents sufficient to evaluate compliance with applicable effluent limits and to perform reasonable potential analysis. Equivalent methods must be more sensitive than those specified in 40 C.F.R. 136 if the method is available in the 40 C.F.R. 136, and must be approved for use by the Regional Water Board Executive Officer.

   Any procedures to prevent the contamination of samples as described in the monitoring program in the APAP shall be implemented.

D. Records of monitoring information shall include the following:

   1. The date, exact place, and time of sampling or measurements;
   2. The individuals who performed the sampling or measurements;
   3. The dates analysis were performed;
   4. The individuals who performed the analyses;
   5. The analytical techniques or methods used; and
   6. Results of analyses.

E. All monitoring instruments and devices used to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their accuracy.

F. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

## II. MONITORING LOCATIONS AND SAMPLE TYPES

### A. Monitoring Locations

Each Discharger or Coalition shall establish monitoring locations specified in the APAP to demonstrate compliance with the receiving water limitations, discharge specifications, and other requirements in this General Permit. The number and location of samples shall be selected to answer the two key questions. A Discharger or Coalition may use representative monitoring locations* to characterize water quality for all waters of the United States within the Discharger's or Coalition's boundaries for each environmental setting (flowing water and non-flowing water). However, the Discharger or Coalition must provide justification for the selection of the representative monitoring locations. To be considered "representative," at a minimum, a location must be similar in hydrology, algaecides and aquatic herbicides use, and other factors that affect the discharge of algaecides and aquatic herbicides and their residues to surface waters as a result of applications to the areas being represented in that environmental setting. Each Discharger or Coalition must provide technical justification and identify which areas are to be considered representative. Monitoring location information shall include a description of the treatment area, GPS

coordinates if feasible, and algaecides and aquatic herbicides being applied. The specific monitoring locations initially identified as representative monitoring locations may be changed based on surveillance of the Discharger or Coalition.

### B. Sample Types

The following monitoring is required for each sampling:

1. **Background Monitoring.** Background monitoring samples shall be collected upstream at the time of the application event* or in the application area* just prior to (up to 24 hours in advance of) the application event.
2. **Event Monitoring.** Event monitoring samples shall be collected immediately downstream of the treatment area in flowing waters or immediately outside of the treatment area in non-flowing waters, immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.
3. **Post-Event Monitoring.** Post-event monitoring samples shall be collected within the treatment area within one week after application.

## III. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

### A. General Monitoring Requirements

The monitoring program described in the APAP shall be designed to answer the two key questions stated above. The monitoring program in the APAP shall describe the tasks and time schedules in which these two key questions will be addressed. Monitoring shall take place at locations that are being planned to be applied or may be applied as described in the Discharger's APAP.

The monitoring program described in the APAP must consider watershed specific attributes and waste constituents, based on the characteristics of applications within the Coalition's or Discharger's area, as well as the receiving water quality conditions. Developing the details of a monitoring design requires clearly defining several inputs to the design and then organizing these in a logical framework that supports effective decision making about indicators, monitoring locations, and monitoring frequency. The logical framework should describe:

1. The basic geographic and hydrographic features of the area, particularly application points and the pathways(s) of residue flows;
2. Algaecides and aquatic herbicides application practices and how they are distributed in space and time;
3. Relevant knowledge about the transport, fates, and effects of algaecides and aquatic herbicides, including best- and worst-case scenarios;
4. Description of the designated beneficial uses in each water body;
5. Relevant knowledge about the action of cumulative and indirect effects;

6. Mechanisms through which algaecides and aquatic herbicides applications could lead to designated use impacts, given the basic features of the area;
7. Known and potential impacts of algaecides and aquatic herbicides applications on water quality, ranked in terms of relative risk, based on factors such as magnitude, frequency and duration;
8. Sufficient number of sampling areas to assess the entire Discharger's or Coalition's area of influence; and
9. A description of sampling methods and a sampling schedule.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by the treatment area. Attention shall be given to the presence or absence of:

1. Floating or suspended matter;
2. Discoloration;
3. Bottom deposits;
4. Aquatic life;
5. Visible films, sheens, or coatings;
6. Fungi, slimes, or objectionable growths; and
7. Potential nuisance conditions.

Notes on receiving water conditions shall be summarized in the monitoring report.

## B. Visual, Physical, and Chemical Monitoring Requirements

Monitoring shall take place at locations that are described and scheduled in the Coalition's or Discharger's APAP. Monitoring for all active ingredients must include frequent and routine monitoring on a pre-determined schedule, as summarized in the Table C-1 below:

**Table C-1. Monitoring Requirements**

| Sample Type | Constituent/Parameter | Units | Sample Method | Minimum Sampling Frequency | Sample Type Requirement | Required Analytical Test Method |
|---|---|---|---|---|---|---|
| Visual | 1. Monitoring area description (pond, lake, open waterway, channel, etc.)<br>2. Appearance of waterway (sheen, color, clarity, etc.)<br>3. Weather conditions (fog, rain, wind, etc.) | Not applicable | Visual Observation | [1] | Background, Event and Post-event Monitoring | Not applicable |
| Physical | 1. Temperature[2] | ºF | Grab[4] | [5] | Background, Event and Post-event Monitoring | [6] |
| | 2. pH[3] | Number | | | | |
| | 3. Turbidity[3] | NTU | | | | |
| | 4. Electric Conductivity[3] @ 25°C | µmhos/cm | | | | |
| Chemical | 1. Active Ingredient[7] | µg/L | Grab[4] | [5] | Background, Event and Post-event Monitoring | [6] |
| | 2. Nonylphenol[8] | µg/L | | | | |
| | 3. Hardness (if copper is monitored) | mg/L | | | | |
| | 4. Dissolved Oxygen[2] | mg/L | | | | |

[1] All applications at all sites.
[2] Field testing.
[3] Field or laboratory testing.
[4] Samples shall be collected at three feet below the surface of the water body or at mid water column depth if the depth is less than three feet.
[5] Collect samples from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non-flowing water) per year, except for glyphosate. If there are less than six application events in a year, collect samples during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water). If the results from six consecutive sampling events show concentrations that are less than the receiving water limitation/trigger for an active ingredient in an environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting. If the yearly sampling event shows exceedance of the receiving water limitation/trigger for an active ingredient in an environmental setting, then sampling shall return to six application events for that active ingredient in each environmental setting. For glyphosate, collect samples from one application event from each environmental setting (flowing water and non-flowing water) per year.
[6] Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136.
[7] 2,4-D, acrolein, dissolved copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, and triclopyr.
[8] It is required only when a surfactant is used.

## IV. REPORTING REQUIREMENTS

### A. General Monitoring and Reporting Requirements

1. The Coalition or Discharger shall comply with all Standard Provisions (Attachment B) related to monitoring, reporting, and recordkeeping.

2. Upon written direction of the State Water Board or the Regional Water Board, the Coalition or Discharger shall submit information as specified.
3. The Coalition or Discharger shall report to the State Water Board and appropriate Regional Water Board any toxic chemical release data that are reported to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act" of 1986 (42 U.S.C. §11001 et. seq.).

**B. Annual Information Collection**

The Coalition or Discharger shall complete and retain all information on the previous reporting year beginning January 1 and ending December 31. When requested by the Deputy Director or Executive Officer of the applicable Regional Water Board, the Coalition or Discharger shall submit the annual information which must include the following:

1. An executive summary discussing compliance or violation of this General Permit and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with algaecide and aquatic herbicide applications;
2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application, if appropriate, and recommendations for improvements to the APAP [including proposed best management practices (BMPs)] and monitoring program based on the monitoring results. All receiving water monitoring data shall be compared to receiving water limitations and receiving water monitoring triggers;
3. Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in this General Permit;
4. A discussion of BMP modifications addressing violations of this General Permit;
5. A map showing the location of each treatment area;
6. Types and amounts of algaecides and aquatic herbicides used at each application event;*
7. Information on surface area and/or volume of treatment areas and any other information used to calculate dosage, concentration, and quantity of each algaecide and aquatic herbicide used;
8. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling area (address, cross roads, etc.), collection date, name of constituent/parameter and its concentration detected, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled, and a comparison with applicable water quality standards, description of analytical QA/quality control plan. Sampling results shall be tabulated so that they are readily discernible; and
9. Summary of algaecide and aquatic herbicide application log.

## C. Annual Report

The Coalition or Discharger shall submit to the Deputy Director and the appropriate Regional Water Board Executive Officer an annual report consisting of a summary of the past year's activities, and certify compliance with all requirements of this General Permit. If there is no discharge of algaecides and aquatic herbicides, their residues, or their degradation byproducts, the Coalition or Discharger shall provide the Deputy Director and the appropriate Regional Water Board Executive Officer a certification that algaecide and aquatic herbicide application activities did not result in a discharge to any water body. The annual report shall contain the following information:

1. An executive summary discussing compliance or violation of this General Permit and the effectiveness of the APAP; and
2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application,
3. Dischargers shall submit the annual report according to the following schedule:

**Table C-2. Reporting Schedule**

| Reporting Frequency | Reporting Period | Annual Report Due |
|---|---|---|
| Annual | January 1 through December 31 | March 1 |

## D. Electronic Reporting

At any time during the term of this General Permit, the State Water Board or the appropriate Regional Water Board may notify the Coalition or Discharger of the requirement to submit electronically Self Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Coalition or Discharger shall submit hardcopy SMRs. The CIWQS website will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

The Coalition or Discharger shall report the results for all monitoring specified in this MRP in the SMR. The Coalition or Discharger shall submit annual SMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this General Permit. If the Coalition or Discharger monitors any pollutant more frequently than required by this General Permit, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

## E. Reporting Protocols

The Coalition or Discharger shall report with each sample result the applicable reported Minimum Level (ML) and the current Minimum Detection Limit, as determined by the procedure in 40 C.F.R. part 136.

The Coalition or Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

1. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
2. Sample results less than the Report Limit, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

   For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (plus a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
3. Sample results less than the laboratory's MDL shall be reported as "<" followed by the MDL.
4. The Coalition or Discharger shall instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Coalition or Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.
5. Multiple Sample Data: If two or more sample results are available, the Coalition or Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or "Not Detected" (ND). In those cases, the Coalition or Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
   a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
   b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.
6. The annual report shall comply with the following requirements:
   a. The Coalition or Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the algaecide and aquatic herbicide applications are conducted in compliance

with effluent and receiving water limitations. The Coalition or Discharger is not required to duplicate the submittal of data that are entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Coalition or Discharger shall submit electronically the data in a tabular format as an attachment.

b. The Coalition or Discharger shall attach a cover letter to the annual report that clearly identifies violations of the permit; discusses corrective actions taken or planned; and provides a time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. The annual report must be submitted to the State Water Board and the appropriate Regional Water Board, signed and certified as required by the Standard Provisions (Attachment B).

## F. Other Reporting Requirements

### 1. Twenty-Four Hour Report

The Coalition or Discharger shall report to the State Water Board and appropriate Regional Water Board any noncompliance, including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Coalition or Discharger becomes aware of the circumstances and must include the following information:

a. The caller's name and telephone number;

b. Applicator name and mailing address;

c. Waste Discharge Identification (WDID) number;

d. The name and telephone number of a contact person;

e. How and when the Coalition or Discharger become aware of the noncompliance;

f. Description of the location of the noncompliance;

g. Description of the noncompliance identified and the U.S. EPA pesticide registration number for each product the Discharger applied in the area of the noncompliance; and

h. Description of any steps that the Coalition or Discharger has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects.

If the Coalition or Discharger is unable to notify the State and the appropriate Regional Water Board within 24 hours, the Coalition or Discharger must do so as soon as possible and also provide the rationale for why the Discharger was unable to provide such notification within 24 hours.

2. **Five-Day Written Report**

The Coalition or Discharger shall also provide a written submission within five (5) days of the time the Discharger becomes aware of the noncompliance. The written submission shall contain the following information:

a. Date and time the Coalition or Discharger contacted the State Water Board and the appropriate Regional Water Board notifying of the noncompliance and any instructions received from the State and/or Regional Water Board; information required to be provided in Section D.1 (24-Hour Reporting);

b. A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size of dead or distressed organisms (other than the pests to be eliminated);

c. Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc);

d. Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected);

e. Algaecide and aquatic herbicide application rate, intended use site (e.g., banks, above, or direct to water), method of application, and name of algaecide and herbicide product, description of algaecide and herbicide ingredients, and U.S. EPA registration number;

f. Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available ambient water data for aquatic algaecides and aquatic herbicides applied);

g. Laboratory tests performed, if any, and timing of tests. Provide a summary of the test results within five days after they become available;

h. If applicable, explain why the Coalition or Discharger believes the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides from the Coalition's or Discharger's application; and

i. Actions to be taken to prevent recurrence of adverse incidents.

The State Water Board staff or Regional Water Board staff may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours.

# Attachment D – Fact Sheet

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## Attachment D – Fact Sheet

As described in Section III, Findings, of this General Permit, the State Water Resources Control Board (State Water Board) incorporates this Fact Sheet as findings of the State Water Board that support the issuance of this General Permit. This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this General Permit.

This General Permit has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California.

# I. PERMIT INFORMATION

## A. Background

### 1. The Regulatory Background

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act or CWA) was amended to provide that the discharge of pollutants to waters of the United States from any point source is effectively prohibited unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit.

On September 22, 1989, the U.S. Environmental Protection Agency (U.S. EPA) granted the State of California, through the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards), the authority to issue general NPDES permits pursuant to title 40 Code of Federal Regulations (40 C.F.R.) 122 and 123.

Section 122.28 of 40 C.F.R. provides for issuance of general permits to regulate a category of point sources if the sources involve the same or substantially similar types of operations; discharge the same type of waste; require the same type of effluent limitations or operating conditions; require similar monitoring; and are more appropriately regulated under a general permit rather than individual permits.

On March 12, 2001, the Ninth Circuit Court of Appeals held that discharges of pollutants from the use of aquatic pesticides in waters of the United States require coverage under an NPDES permit. (*Headwaters, Inc. v. Talent Irrigation District).*[3] The *Talent* decision was issued just prior to the major season for applying aquatic pesticides.

Because of the serious public health, safety, and economic implications of delaying pesticide applications, in 2001 the State Water Board adopted Water Quality Order (Order) No. 2001-12-DWQ, Statewide General NPDES Permit for

[3] 243 F.3d 526 (9th Cir., 2001).

Discharges of Aquatic Pesticides to Waters of the United States on an emergency basis to provide immediate NPDES permit coverage for broad categories of aquatic pesticide use in California.

Order No. 2001-12-DWQ imposed requirements on any discharge of aquatic pesticides by public entities to waters of the United States in accordance with the Policy which establishes procedures for implementing water quality standards for priority pollutants* in NPDES permits.

Section 5.3 of the State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Policy) allows for short-term or seasonal exceptions from its requirements for resource or pest management conducted by public entities or mutual water companies. In order to qualify for an exception from meeting priority pollutant standards, a public entity must fulfill the requirements listed in section 5.3 and the State Water Board must decide to grant the exception. Among other requirements, entities seeking an exception to complying with water quality standards for priority pollutants must submit documents in compliance with California Environmental Quality Act (CEQA).[4] Because of the emergency adoption of Order No. 2001-12-DWQ, the State Water Board invoked an exemption to the requirements of section 5.3 of the Policy and issued the permit incorporating a categorical exception to water quality standards for priority pollutants.

Order No. 2001-12-DWQ required that Dischargers develop a best management practices (BMPs) plan that minimizes adverse impacts to receiving waters and a monitoring and reporting plan that is representative of each type of aquatic pesticide application.

In August 2001, Waterkeepers Northern California (Waterkeepers) filed a lawsuit against the State Water Board challenging several aspects of Order No. 2001-12-DWQ. Major aspects of the challenge included the emergency adoption of the Order without compliance with CEQA and other exception requirements of the Policy; failure to address cumulative impacts; and failure to comply with the California Toxics Rule (CTR).[5]

In a settlement of the Waterkeepers' lawsuit, the State Water Board agreed to fund a comprehensive aquatic pesticide monitoring program that would assess receiving water toxicity caused by aquatic pesticides and alternatives for pesticide use. The State Water Board contracted with the San Francisco Estuary Institute (SFEI) to conduct the program. SFEI published the final report on February 5, 2004.

In November 2002, the Ninth Circuit issued another opinion concerning the need for an NPDES permit for pesticide application. (*League of Wilderness Defenders*

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[4] Cal. Pub. Resources Code § 21000 et. seq.
[5] 40 C.F.R. Section 131.38.

*v. Forsgren*.[6]) In this case, the court held that the USDA Forest Service must obtain an NPDES permit before it sprays insecticides* from an aircraft directly into or over rivers as part of silviculture activities. The court found that the insecticides are pollutants under the CWA. The court also defined the exemption for silvicultural pest control from the definition of "point source" in U.S. EPA's regulations to be limited to pest control activities from which there is natural runoff.

Also in 2002, the Second Circuit issued an unpublished decision regarding the need for an NPDES permit for application of pesticides for mosquito control in federal wetland areas. (*Altman v. Town of Amherst*.) The lower court had dismissed a citizens' suit, holding that pesticides, when used for their intended purpose, do not constitute a "pollutant" for purposes of the CWA, and are more appropriately regulated under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The appeals court vacated the trial court's decision and remanded the matter. In its unpublished decision, the Second Circuit expressed concern that: "[u]ntil the EPA articulates a clear interpretation of current law - among other things, whether properly used pesticides released into or over waters of the United States can trigger the requirements for NPDES permits - the question of whether properly used pesticides can become pollutants that violate the [Clean Water Act] will remain open."

Order No. 2001-12-DWQ expired on January 31, 2004. In 2004, it was replaced by two general permits: a vector control permit for larvicides (Order No. 2004-0008-DWQ) and a weed control permit (Order No. 2004-0009-DWQ). The State Water Board determined that adoption of these two permits was consistent with the Ninth Circuit decisions.

In 2005, the Ninth Circuit held that a pesticide that is applied consistent with FIFRA is not a "chemical waste" (*Fairhurst v. Hagener),*[7] but also stated that it would not change its decision in *Headwaters.* The court stated that whether an NPDES permit was required depends on whether there was any "residue or unintended effect" from application of the pesticide. In *Fairhurst*, the court found neither residue nor unintended effect was present. Therefore, the pesticide application at issue did not require an NPDES permit.

**U.S. EPA's Final Rule:** On November 20, 2006, U.S. EPA adopted a final regulation providing that NPDES permits are not required for pesticide applications as long as the Discharger follows FIFRA label instructions. According to the regulation, pesticides applied under the following two circumstances are not pollutants and, therefore, are not subject to NPDES permitting requirements:

a. The application of pesticides directly to waters of the United States in order to control pests. Examples of such applications include applications to control

[6] 309 F.3d 1181 (9th Cir., 2002).
[7] 422 F.3d 1146 (9th Cir., 2005).

mosquito larvae, aquatic weeds, or other pests that are present in waters of the United States; and

b. The application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States in order to target the pests effectively; for example, when insecticides are aerially applied to a forest canopy where waters of the United States may be present below the canopy or when pesticides are applied over or near water for control of adult mosquitoes or other pests.

**Lawsuits Against U.S. EPA's Final Rule:** After U.S. EPA's new regulation was adopted in 2006, lawsuits were filed by both the pesticide industry and environmental groups in 11 of the 13 Circuits, including the Ninth Circuit Court, challenging U.S. EPA's Final Rule.

***The National Cotton Council of America v. U.S. EPA:***[8] The petitions for review were consolidated in the Sixth Circuit Court by an order of the Judicial Panel on Multidistrict Litigation.

On January 11, 2009, the Sixth Circuit Court of Appeals determined that U.S. EPA's Final Rule is not a reasonable interpretation of the CWA and vacated the Final Rule. U.S. EPA did not request reconsideration of the decision, but did file a motion for a two-year stay of the effect of the decision in order to provide agencies time to develop, propose, and issue NPDES general permits for pesticide applications covered by the ruling. On June 8, 2009, the Sixth Circuit granted the motion, such that the U.S. EPA exemption was to remain in place until April 9, 2011. Subsequently, U.S. EPA was granted an extension of the stay, which allowed the exemption to continue until October 31, 2011.

2. **Related Pesticide Regulation Information**

Pesticide formulations may include "active ingredients" and "inert ingredients." Adjuvants or surfactants may be added to the ingredients in the application equipment that is used in the delivery of the aquatic pesticide.

As part of the registration process of pesticides for use in California, U.S. EPA and the California Department of Pesticide Regulation (DPR) evaluate data submitted by registrants to ensure that a product used according to label instructions will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions. Registrants are required to submit data on the effects of pesticides on target pests (efficacy) as well as non-target effects. Data on non-target effects include plant effects (phytotoxicity), fish and wildlife hazards (ecotoxicity), impacts on endangered species, effects on the environment, environmental fate, degradation byproducts, leachability, and persistence. Requirements that are specific to use in California are included in many pesticide labels that are approved by U.S. EPA.

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[8] 553 F.3d 927 (6th Cir., 2009).

Use must be reported to the County Agricultural Commissioner where required by law or by agreement with DPR.

The CWA, at section 301(a), broadly prohibits the discharge of any pollutant to waters of the United States, except in compliance with an NPDES permit. Since FIFRA is not necessarily as protective of water quality as the CWA, pesticides discharged into surface waters may constitute pollutants within the meaning of the CWA even if the discharge is in compliance with the registration requirements of FIFRA, thus, requiring coverage under a valid NPDES permit.

DPR and the County Agricultural Commissioners regulate the sale and use of pesticides in California. Pesticide applications subject to this General Permit must be consistent with permits issued by County Agricultural Commissioners and the pesticide label instructions approved by U.S. EPA under FIFRA. According to federal law, pesticide label language is under the sole jurisdiction of U.S. EPA. Label language and any changes thereto must be approved by U.S. EPA before the product can be sold in this country. DPR cannot require manufacturers to make changes on labels; however, DPR can refuse to register products unless manufacturers address unmitigated hazards by amending the pesticide label.

State regulations require that the County Agricultural Commissioners determine if a substantial adverse environmental impact will result from the proposed use of a restricted material. If the County Agricultural Commissioner determines that this is likely, the commissioner may deny the restricted pesticide use permit or may issue it under the condition that site-specific use practices be followed (beyond the label and applicable regulations) to mitigate potentially adverse effects. DPR conducts scientific evaluations of potential health and environmental impacts and provides commissioners with information in the form of suggested permit conditions. DPR's suggested permit conditions reflect minimum measures necessary to protect people and the environment. County Agricultural Commissioners use this information and its evaluation of local conditions to set site-specific limits in permits.

## B. General Criteria

1. This General Permit serves as a general NPDES Permit for the discharge of residual algaecides and aquatic herbicides to surface waters as a result of algaecides and aquatic herbicides applications for algae and aquatic weed controls.
2. Dischargers who submit a complete application under this General Permit are not required to submit an individual permit application. The State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) may request additional information or determine that a Discharger is not eligible for coverage under this General Permit and would be better regulated under an individual permit or other general NPDES permit adopted by the appropriate Regional Water Board. If the discharge becomes covered by an individual or another general permit, the applicability of this General Permit to the specified discharge

will be immediately terminated on the effective date of the individual permit or coverage under the other general permit.

## II. NOTIFICATION REQUIREMENTS

### A. General Permit Application

To obtain authorization under this General Permit, Dischargers must submit to the State Water Board a complete application at least 90 days prior to their first application of the season. This is to allow posting of the Aquatic Pesticide Application Plan (APAP) for a 30-day comment period, staff to review APAP and respond to comments, and the Deputy Director to issue the Notice of Applicability (NOA). Following are the application information requirements:

1. A Notice of Intent (NOI shown as Attachment E) signed in accordance with the signatory requirements of the Standard Provisions in Attachment B;
2. An application fee. A fee is required only for new Dischargers. Dischargers that are enrolled under Order No. 2004-0009-DWQ and are applying for coverage under this Permit will be billed during the regular billing cycle; and
3. An APAP.

State Water Board staff will post the APAP on the State Water Board's website for 30 days for public review. In the meantime, the State and Regional Water Board staff will review the application package for completeness and applicability to this General Permit. After the application has been deemed complete, the Deputy Director will issue an NOA. The NOA will specify the permitted active ingredients of algaecides and aquatic herbicides that may be used, and any Regional Water Board specific conditions and requirements not stated in this General Permit. Any such region-specific conditions and requirements shall be enforceable. The Discharger is authorized to discharge starting on the date of the NOA. If comments are received, staff will immediately work to resolve them in order to issue an NOA within 90 days of receipt of the application.

This General Permit specifices an effective date of December 1, 2013. The effective date is delayed because, with the impending start of the 2013 application season, Dischargers may be unable to comply with the requirement to submit their applications 90 days prior to their first pesticide application.The delay will allow enrollees under Water Quality Order No. 2004-0009-DWQ to have continued permit coverage throughout the 2013 application season while preparing their new application for coverage under this General Permit; new enrollees to prepare and submit their applications as well; and Water Boards' staff to process the applications and issue NOAs.

Alternatively, the Deputy Director may issue a Notice of Exclusion**,** which either terminates permit coverage or requires submittal of an application for an individual permit or alternative general permit.

### B. Fee

The annual fee for enrollment under this General Permit, shall be based on Category 3 in section 2200(b)(9) of title 23, California Code of Regulations (Cal. Code Regs.). This category is appropriate because algaecide and aquatic herbicide applications incorporate BMPs to control potential impacts to beneficial uses, and this General Permit prohibits pollutant discharge associated with algaecide and aquatic herbicide applications from causing exceedance of CTR criteria or water quality objectives. Information concerning the applicable fees can be found at http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl_npdes_prmt.pdf

### C. Public Notification

The State Water Board has notified interested agencies and persons of its intent to prescribe waste discharge requirements in this General Permit and provided them with an opportunity to submit their written comments and recommendations.

## III. DISCHARGE DESCRIPTION

This General Permit covers the point source discharge to waters of the United States of pesticide residues resulting from applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol. This General Permit covers only discharges of algaecides, aquatic herbicides, and adjuvants that are currently registered for use in California, or that become registered for use and contain the above-listed active ingredients and ingredients represented by the surrogate of nonylphenol.

### A. Existing Discharge Description

As of January 11, 2013, there were 153 active enrollees under Water Quality Order No. 2004-0009-DWQ, Statewide General National Pollutant Discharge Elimination System Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States, General Permit No. CAG990005 (Order No. 2004-0009-DWQ). Most of the enrollees are local public agencies such as cities and irrigation, flood control, or reclamation districts. The other enrollees include six state of California agencies: the Departments of Boating and Waterways, Fish and Wildlife, Food and Agriculture, Parks and Recreation, Transportation, and Water Resources; a federal agency, U.S. Department of Fish and Wildlife Service; and a few private entities such as home owner associations and mobile home park owners.

The State Water Board granted exceptions to public agencies and mutual water companies that met the criteria stated in section 5.3 of the Policy for short-term or seasonal exceptions from meeting the receiving water limitations for priority pollutants of acrolein and copper.

Order No. 2004-0009-DWQ permits the discharge of aquatic pesticides with the following active ingredients: 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, and triclopyr. The State Water Board reopened Order No. 2004-0009-DWQ after its adoption to add two more active ingredients: (1) imazapyr, a non-selective herbicide, for control of cordgrass and broadleaf weeds and other emergent aquatic species; and (2) sodium carbonate peroxyhydrate as an alternative to copper for algae control.*

## B. Annual Report Review

State Water Board staff reviewed annual reports from 2004 through 2008[9] submitted under Order No. 2004-0009-DWQ. The data are summarized in Table D-1 below. As shown in Table D-1, all constituent concentrations from post-event application samples were below receiving water limitations except for the following: three exceedances each for acrolein and glyphosate and 82 exceedances for copper out of 288 monitoring events. For glyphosate, it is likely that the three exceedances were not the result of aquatic pesticide applications because the pre-application samples also showed exceedances and the remaining 151 sampling events showed no exceedance. For copper, 43 of the 82 exceedances were from public agencies or mutual water companies that were excepted from meeting priority pollutant limitations during the exception period. Thus, staff did not consider these exceedances as violations of the receiving water limitations. However, 39 of the exceedances were from entities that did not have a Policy exception. Therefore, staff considered these exceedances as true violations of the receiving water limitations.

**Table D-1. Monitoring Data Summary, 2004-2008, Order No. 2004-0009-DWQ**

| Pollutant | Number of Samples | Number of Exceedance |
|---|---|---|
| 2,4-D | 3 | 0 |
| Acrolein | 213 | 3 |
| Copper | 288 | 85 |
| Diquat | 17 | 0 |
| Endothall | 6 | 0 |
| Fluridone | 12 | 0 |
| Glyphosate | 154 | 3 |
| Nonylphenol | 53 | 0 |

Under Order No. 2004-0009-DWQ, the most commonly used aquatic pesticide products contained copper, acrolein, and glyphosate in descending order.

[9] The data are submitted to the Regional Water Boards per Order No. 2004-0009-DWQ. When State Water Board staff started collecting data from the Regional Water Boards, the data available covered only this period.

### C. Receiving Water Description

The annual reports showed that most algae and aquatic weed control applications were performed in fresh inland surface waters such as lakes, ponds, flood control and drainage channels, or canals. Some applications were performed in coastal waters, marina lagoons, and slough with brackish water.

## IV. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this General Permit are based on the applicable plans, policies, and regulations identified below.

### A. Legal Authorities

This General Permit is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (U.S. EPA) and chapter 5.5, division 7 of the California Water Code, commencing with section 13370. It shall serve as an NPDES permit for point source discharges of residual algaecides and aquatic herbicides to surface waters. This General Permit also serves as WDRs pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with §13260).

This General Permit shall serve as a General NPDES permit for point source discharges of residues from algaecides and aquatic herbicide applications for algae and aquatic weed control. This General Permit also serves as general Waste Discharge Requirements pursuant to article 4, chapter 4, and division 7 of the California Water Code (commencing with §13260).

### B. California Environmental Quality Act (CEQA)

Pursuant to California Water Code section 13389, State and Regional Water Boards are exempt from the requirement to comply with Chapter 3, Division 13 of the Public Resources Code when adopting NPDES permits.

### C. State and Federal Regulations, Policies, and Plans

#### 1. Water Quality Control Plans (Basin Plans)

The Regional Water Boards have adopted Basin Plans that designate beneficial uses, establish water quality objectives, and contain implementation programs and policies to achieve those objectives for all waters addressed through the plans. In addition, the Basin Plans implement State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. The Basin Plans identify typical beneficial uses as follows: municipal and domestic supply, agricultural irrigation, stock watering, process supply, service supply, hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation,* warm freshwater aquatic habitat, cold freshwater habitat,* warm fish migration habitat, cold fish migration habitat,

warm and cold spawning habitat, wildlife habitat, navigation, rare, threatened, or endangered species habitat, groundwater recharge,* and freshwater replenishment.

Requirements of this General Permit implement provisions contained in the applicable Basin Plans.

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR)**

U.S. EPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR applied in California. On May 18, 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

3. **State Implementation Policy (Policy)**

On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (Policy). The Policy became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by U.S. EPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plans. The Policy became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by U.S. EPA through the CTR. The State Water Board adopted amendments to the Policy on February 24, 2005 that became effective on July 13, 2005. The Policy establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this General Permit implement the Policy.

*Policy Exception*

The Policy provides categorical exceptions allowing short-term or seasonal exceptions from meeting the priority pollutant criteria/objectives if it is determined to be necessary to implement control measures for resource or pest management conducted by public entities or mutual water companies to fulfill statutory requirements. The Policy specifically refers to vector or weed control, pest eradication, or fishery management as the basis for categorical exceptions. The exceptions are only granted to public entities or mutual water companies that have adequately provided the following information as required by the Policy:

a. A detailed description of the proposed action which includes the proposed method of completing the action;

c. A time schedule;

d. A discharge and receiving water monitoring plan that specifies monitoring prior to application events,* during application events, and after completion with the appropriate quality control procedures;

e. CEQA documentation including notifying potentially affected public and government agencies; and

f. Any necessary contingency plans.

The public entities and mutual water companies listed in Attachment G have met the above requirements before the issuance or during the term of the Order No. 2004-0009-DWQ.

The final Negative Declaration or Mitigated Negative Declarations (ND/MND) prepared by the public entities or mutual water companies have determined that the water quality impacts identified in the environmental assessments of the ND/MND from algaecide and aquatic herbicide applications are less than significant, and would not have a significant effect on the environment. The boards of each public entity and mutual water company*, as the lead agencies under CEQA, approved the final ND/MND. Therefore, each public entity or mutual water company is not required to meet priority pollutant criteria during the exception period.

During the issuance of the Order No. 2004-0009-DWQ, as required in section 15096 of the CEQA Guidelines, the State Water Board, as a Responsible Agency under CEQA, considered the ND/MND approved by the board of each public entity or mutual water company. The State Water Board found that the projects will have less than significant water quality impact if the Dischargers meet the requirements in this General Permit. Accordingly, the Policy 5.3 exception granted previously will continue to be valid under this Order.

Any Discharger not listed in Attachment G is required to meet all applicable priority pollutant criteria for receiving waters.

4. **Antidegradation Policy**

Section 131.12 of 40 C.F.R. requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plans implement, and incorporate by reference, both the state and federal antidegradation policies.

The permitted discharge must be consistent with the antidegradation provision of 40 C.F.R. section 131.12 and Resolution No. 68-16. The conditions of this General Permit require residual algaecide and aquatic herbicide discharges to meet applicable water quality objectives. Specifically, the General Permit sets receiving water limitations for 2,4-D, acrolein, copper, diquat, endothall, fluridone glyphosate, and nonylphenol. It also sets receiving water monitoring triggers for imazapyr and triclopyr triethylamine (TEA).

The BMPs and other controls required pursuant to the General Permit constitute Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT).

The General Permit requirements are protective of the broad range of beneficial uses set forth in basin plans throughout the state, constituting best control available consistent with the purposes of the algaecide and aquatic herbicide application in order to ensure that pollution or nuisance will not occur. The nature of pesticides is to be toxic in order to protect beneficial uses such as human health or long-term viability of aquatic life. For example, blue-green algae are bacteria that live in both fresh and marine waters. In California, certain forms of blue-green algae have been a particular problem in the Klamath River watershed and on the Central Coast. Blooms of these bacteria can poison livestock, wildlife, and humans; they can also damage drinking water sources. The use of an algaecide is one of the effective ways to control the harmful blooms of blue-green algae. Although algaecide application will temporarily degrade the water quality and result in short-term toxicity in the receiving water, it prevents the toxicities in the entire water body for a long period of time. While surface waters may be temporarily degraded; water quality standards and objectives will not be exceeded after project completion.

Another example of benefits of pesticide application is the control of aquatic weeds in flood control channels. Aquatic herbicides used to control emerging aquatic weeds in a flood control channel will effectively prevent full growth and bloom of aquatic weeds that may block the channel and cause flooding in the surrounding communities. Although the water quality is temporarily degraded while the herbicide is taking its effect in eliminating the weeds, the water quality will not be exceeded after the project is completed. In addition, the receiving water limitations and other requirements of this General Permit will ensure maintenance of the highest water quality consistent with maximum benefit to the people of the state.

Given the nature of a General Permit and the broad range of beneficial uses to be protected across the state, data analysis of specific water bodies is infeasible. While surface waters may be temporarily degraded, water quality standards and objectives will not be exceeded. The nature of pesticides is to be toxic in order to protect human health and water resources. However, compliance with receiving water limitations is required. Therefore, this General Permit is consistent with state and federal antidegradation policies.

5. **Endangered Species Act**

This General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. §1531 et. seq). This General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

6. **Impaired Water Bodies on CWA 303(d) List**

   This General Permit does not authorize the discharge of residual algaecides and aquatic herbicides and their degradation byproducts to waters of the United States that are impaired by the same active ingredients and their degradation byproducts. The links to California's impaired waters bodies are provided at http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtm.

7. **Other Plans, Policies, and Regulations**

   The State Water Board adopted the *Water Quality Control Policy for the Enclosed Bays and Estuaries of California*. The requirements within this General Permit are consistent with the policy.

## V. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the CWA and amendments thereto are applicable to the discharge.

The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: (1) 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and (2) 40 C.F.R. section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law (33 U.S.C., §1311(b)(1)(C); 40 C.F.R. §122.44(d)(1)). NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to numeric criteria specifying maximum amounts of particular pollutants. Pursuant to 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality*." Section 122.44(d)(1)(vi) of 40 C.F.R. further provides that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits*."

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based

limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established.

With respect to narrative objectives, the State Water Board must establish effluent limitations using one or more of three specified sources: (1) U.S. EPA's published water quality criteria; (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria; or (3) an indicator parameter (i.e., 40 C.F.R. §122.44(d)(1)(vi)(A), (B) or (C)). Basin Plans contain a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" Basin Plans require the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. Basin Plans state that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. Basin Plans also limit chemical constituents in concentrations that adversely affect surface water beneficial uses. Basin Plans further state that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

### A. Discharge Prohibitions

1. The discharge of residual algaecides, residual aquatic herbicides, and their degradation byproducts in a manner different from that described in this General Permit is prohibited.

   This prohibition is based on 40 C.F.R. 122.21(a), "Duty to Apply," and California Water Code section 13260, which requires filing a Report of Waste Discharge before discharges can occur. Discharges not described in the NOI, and subsequently not discharged in the manner permitted by this General Permit, are prohibited.

2. The discharge of residual algaecides, residual aquatic herbicides, and their degradation byproducts shall not create a nuisance as defined in section 13050 of the California Water Code.

   This prohibition is based on California Water Code section 13050 for water quality control for achieving water quality objectives.

3. The discharge shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable standard or criterion promulgated by U.S. EPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or Regional Water Boards.

   This prohibition is based on CWA section 301 and California Water Code.

4. All pesticides are prohibited from the waters of the Lahontan Region (Region 6). The use of this permit is invalid in the Lahontan Region unless the discharger has

requested a prohibition exemption from the Lahontan Water Board and the Lahontan Water Board has granted an exemption for the use of algaecides or aquatic herbicides.

This prohibition is based on the Lahontan Water Board's region-wide waste discharge prohibition for pesticides in water with exemption criteria to allow certain uses of aquatic pesticides.

## B. Effluent Limitations

### 1. Technology-Based Effluent Limitations

The intent of technology-based effluent limitations in NPDES permits is to require a minimum level of treatment of pollutants based on available treatment technologies while allowing the Discharger to use any available control technique to meet the limitations. For industrial and other non-municipal facilities, technology-based effluent limitations are derived by using: (1) national effluent limitations guidelines and standards established by U.S. EPA; or best professional judgment on a case-by-case basis in the absence of national effluent limitations guidelines and standards. In the case of pesticide applications, U.S. EPA has not developed guidelines and standards other than the requirement to follow the labels when applying pesticides. At this point, it is not appropriate to establish technology-based effluent limitations other than following the label when applying algaecides and aquatic herbicides.

Therefore, the effluent limitations contained in this General Permit are narrative and include requirements to develop and implement an APAP that describes appropriate BMPs, including compliance with all algaecide and aquatic herbicide label instructions, and to comply with numeric receiving water limitations and actions required if monitoring triggers are exceeded.

The BMPs required herein constitute BAT and BCT and will be implemented to minimize the area and duration of impacts caused by the discharge of algaecides and aquatic herbicides in the treatment area and to allow for restoration of water quality and protection of beneficial uses of the receiving waters to pre-application quality following completion of an application event.* In addition, for those enrollees that have been granted an exception to meeting receiving water limitations for acrolein and copper, in accordance with the Policy, this General Permit requires that upon completion of a pesticide application project, the Discharger shall provide certification by a qualified biologist that the receiving water beneficial uses have been restored.

The development of BMPs provides the flexibility necessary to establish controls to minimize the area extent and duration of impacts caused by the discharge of algaecides and aquatic herbicides. This flexibility allows Dischargers to implement appropriate BMPs for different types of applications and different types of waters.

Much of the BMP development has been incorporated into the algaecide and aquatic herbicide regulation process by U.S. EPA, DPR, and County Agricultural

Commissioners. The Dischargers must be licensed by DPR if such licensing is required for the algaecide and aquatic herbicide application project. The algaecide and aquatic herbicide use must be consistent with the algaecide and aquatic herbicide label instructions and any Restricted Material Use Permits issued by County Agricultural Commissioners.

U.S. EPA and DPR scientists review algaecide and aquatic herbicide labels to ensure that a product used according to label instructions will cause no harm (or "adverse impact") on non-target organisms that cannot be reduced (or "mitigated") with protective measures or use restrictions. Many of the label directions constitute BMPs to protect water quality and beneficial uses. Label directions may include: precautionary statements regarding toxicity and environmental hazards; directions for proper handling, dosage, application, and disposal practices; prohibited activities; spill prevention and response measures; and restrictions on type of water body and flow conditions.

A Restricted Material Use Permit issued by the County Agricultural Commissioner incorporates applicable suggested permit conditions from DPR and local site-specific conditions necessary to protect the environment. State regulations require that specific types of information be provided in an application to the County Agricultural Commissioners for a Restricted Material Use Permit. The County Agricultural Commissioners review the application to ensure that appropriate alternatives were considered and that any potential adverse effects are mitigated. The County Agricultural Commissioners also conduct pre-project inspections on at least five percent of projects.

This General Permit requires that Dischargers use BMPs when implementing control programs in order to mitigate effects to water quality resulting from algaecide and aquatic herbicide applications. Dischargers are required to consider alternative control measures to determine if there are feasible alternatives to the selected algaecide and aquatic herbicide application project that could reduce potential water quality impacts. If the Discharger identifies alternative control measures to the selected algaecide and aquatic herbicide application project that could reduce potential water quality impacts and that are also feasible, practicable, and cost-effective, the Discharger shall implement the identified alternative measures. The selection of control measures that use non-toxic and less toxic alternatives is an example of an effective BMP.

2. **Water Quality-Based Effluent Limitations (WQBELs)**

a. **Scope and Authority**

Section 122.44(d)(1)(i) of 40 C.F.R. mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using: (1) U.S. EPA criteria under CWA section 304(a), supplemented where necessary by other relevant information; (2) an

indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 C.F.R. section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plans, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

Section 122.44(k)(3) of 40 C.F.R. allows the use of other requirements such as BMPs in lieu of numeric effluent limits if the latter are infeasible. It is infeasible for the State Water Board to establish numeric effluent limitations in this General Permit because:

i. The application of algaecides and aquatic herbicides is not necessarily considered a discharge of pollutants according to the *National Cotton Council of America v. U.S. EPA*[10] and other applicable case law. The Sixth Circuit Court of Appeals ruled that residual pesticides associated with the application of pesticides at, over, or near water constitute pollutants within the meaning of the CWA and that the discharge must be regulated under an NPDES permit;

ii. This General Permit regulates the discharge of residual algaecides and aquatic herbicides used for algae and aquatic weed control to waters of the United States. These are algaecides and herbicides with registration labels that explicitly allow direct application to water bodies. In algaecides and aquatic herbicides applications to control pests, any algaecides and aquatic herbicides residue or degradation byproduct that is deposited in waters of the United States is a pollutant. However, at what point the algaecides and aquatic herbicides become a residue is not precisely known and varies depending on the type of algaecides and aquatic herbicides, application method and quantity, water chemistry, etc. Therefore, in the application of algaecides and aquatic herbicides, the exact effluent is unknown;

iii. It would be impractical to provide effective treatment of the algaecides and aquatic herbicides residue to protect water quality, given typically, algaecides and aquatic herbicides applications consist of numerous short duration intermittent algaecides and aquatic herbicides residue releases to surface waters from many different locations; and

iv. Treatment may render the algaecides and aquatic herbicides useless for algae and aquatic weed control.

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[10] 553 F.3d 927 (6th Cir., 2009)

Therefore, as stated in Technology-Based Effluent Limitations, Section V.B.1 above, the effluent limitations contained in this General Permit are narrative and include requirements to develop and implement an APAP that describes appropriate BMPs, including compliance with all algaecides and aquatic herbicides label instructions, and to comply with narrative receiving water limitations and triggers.

b. **Receiving Water Beneficial Uses**

Algaecide and aquatic herbicide applications for algae and aquatic weed control may potentially deposit residual algaecides and aquatic herbicides to surface waters. Beneficial uses of receiving waters are as follows: municipal and domestic supply, agricultural irrigation, agricultural stock watering, process water supply, service water supply, and hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm and cold spawning habitat, wildlife habitat, navigation, groundwater recharge, and freshwater replenishment. Requirements of this General Permit implement the applicable Basin Plans.

c. **Determining the Need for WQBELs**

Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR, as well as antidegradation policies. The Basin Plans include numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*." With regard to the narrative chemical constituent objective, the Basin Plans state that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "…*water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)" in title 22 of CCR.* The narrative tastes and odors objective states: *"Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses*."

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard.

d. **Antidegradation Policy**

The permitted discharge is consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. Due to the low volume of discharge expected from discharges regulated under this General Permit, the impact on existing water quality will be insignificant. Dischargers seeking authorization to discharge under this General Permit are required to demonstrate compliance with receiving water limitations during the application. If, however, the appropriate Regional Water Board, subsequent to review of any application, finds that the impact of a discharge will be significant, then authorization for coverage under this General Permit will be denied and coverage under an individual permit will be required (including preparation of an antidegradation analysis).

## VI. RATIONALE FOR RECEIVING WATER LIMITATIONS AND MONITORING TRIGGERS

### A. Groundwater

[Not Applicable]

### B. Surface Water

CWA section 303(a-c), requires states to adopt water quality standards, including criteria necessary to protect beneficial uses. Regional Water Boards adopted water quality criteria as water quality objectives in the Basin Plans. The Basin Plans state that "[t]*he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.*" The Basin Plans include numeric and narrative water quality objectives for various beneficial uses and water bodies. This General Permit contains receiving water limitations based on the Basin Plans' numerical and narrative water quality objectives for bio-stimulatory substances, chemical constituents, color, temperature, floating material, settleable substances, suspended material, tastes and odors, and toxicity. This General Permit also requires compliance with any amendment or revision to the water quality objectives contained in the Basin Plans adopted by Regional Water Boards subsequent to adoption of this General Permit.

Once algaecides and aquatic herbicides have been applied to a treatment area, the algaecide and aquatic herbicide product can actively control pests within the treatment area. The discharge of algaecides and aquatic herbicides, their residues, and their degradation byproducts from the applications to surface water must meet applicable water quality criteria and objectives. The receiving water limitations ensure that an application event* does not result in an exceedance of a water quality standard in the receiving water.

To protect all designated beneficial uses of the receiving water, the most protective (lowest) and appropriate (to implement the CTR criteria and WQOs in the Basin

Plans) criteria should be selected as the permit limitation for a particular water body and constituent. In many cases, water quality standards include narrative, rather than numerical, water quality objectives. In such cases, numeric water quality limits from the literature or publicly available information may be used to ascertain compliance with water quality criteria.

Algaecide and aquatic herbicide formulations contain disclosed “active” ingredients that yield toxic effects* on target organisms and may also have toxic effects on non-target organisms. Algaecide and aquatic herbicide active ingredients that do not contain pollutants for which there are applicable numeric CTR criteria may still have toxic effects on receiving water bodies. In addition, the inactive or “inert” ingredients of algaecides and aquatic herbicides, which are trade secrets and have not been publicly disclosed, may also contain toxic pollutants or pollutants that could affect water quality.

DPR is responsible for reviewing toxic effects of product formulations and determining whether an algaecide or aquatic herbicide is suitable for use in California’s waters. In this General Permit, inert ingredients are also considered on a constituent-by-constituent basis. U.S. EPA regulates pesticide use through strict labeling requirements in order to mitigate negative impacts to human health and the environment, and DPR environmental and medical toxicologists review toxicity data on formulations and can deny registration or work with registrants or County Agricultural Commissioners to impose additional requirements in order to protect human health or the environment.

U.S. EPA and DPR require that pesticides undergo toxicity testing and meet specific toxicity requirements before registering the pesticide for application to surface waters. U.S. EPA has found that the application of properly registered pesticides pose a minimal threat to people and the environment. In addition, the effects of these pesticides on water quality will be mitigated through compliance with FIFRA label requirements, application of BMPs, and monitoring.

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the MCLs set forth in title 22, Cal. Code Regs. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plans require the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

1. **Receiving Water Limitations**

The instantaneous maximum receiving water limitations are based on promulgated water quality criteria such as those provided in the CTR, water quality objectives adopted by the State and Regional Water Boards in their Basin Plans, water quality criteria adopted by the California Department of Fish and Wildlife, water quality standards such as drinking water standards adopted by U.S. EPA or the California Department of Public Health (CDPH), or U.S. EPA National Recommended Ambient Water Quality Criteria.

This General Permit provides receiving water limitations based on the lowest water quality criteria/objectives to protect all designated beneficial uses of the receiving water. The receiving water limitations in this General Permit are the same as those in Order No. 2004-0009-DWQ. The rationale for each limitation is summarized below.

**Table D-2. Summary of Receiving Water Limitations**

| Constituent/ Parameter | BENEFICIAL USE[1] | | | | Basis |
|---|---|---|---|---|---|
| | MUN, µg/L | WARM or COLD, µg/L | Other than MUN, WARM, or COLD, µg/L | All Designations | |
| 2,4,-D | 70 | | | | U.S. EPA MCL |
| Acrolein[2] | 320 | 21 | 780 | | U.S. EPA Water Quality Criteria, 1986. |
| Copper[2] | | | | Dissolved Freshwater[3]<br>Copper Chronic = 0.960exp{0.8545 [ln(hardness[4])] – 1.702} [5, 6]<br><br>Dissolved saltwater[3]<br>Copper Chronic = 0.83exp{0.8545 [ln(hardness[4])] – 1.702} [5,6] | California Toxics Rule |
| Diquat | 20 | | | | U.S. EPA MCL |
| Endothall | 100 | | | | U.S. EPA MCL |
| Fluridone | 560 | | | | U.S. EPA Integrated Risk Information System |
| Glyphosate | 700 | | | | U.S. EPA MCL |
| Nonylphenol | | | | Freshwater Chronic Criterion = 6.6 µg/L<br><br>Saltwater Chronic Criterion = 1.7 µg/L | U.S. EPA National Recommended Ambient Water Quality Criteria |
| Toxicity | Algaecide and aquatic herbicide applications shall not cause or contribute to toxicity in receiving water(s). | | | | Regional Water Boards' Basin Plans |

Notes
1. See Regional Water Boards' Water Quality Control Plans (Basin Plans) for beneficial use definitions.
2. Public entities and mutual water companies listed in Attachment G are not required to meet this receiving water limitation during the exception period described in Section VIII.C.10, Limitations and Discharge Requirements, Aquatic Pesticides Application Plan (APAP).

3. For waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the freshwater criteria apply. For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, saltwater criteria apply. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria.
4. For freshwater aquatic life criteria, waters with a hardness 400 mg/L or less as calcium carbonate, the actual ambient hardness of surface water shall be used. For waters with a hardness of over 400 mg/L as calcium carbonate, a hardness of 400 mg/L as calcium carbonate shall be used with a default Water-Effect Ratio of 1.
5. Values should be rounded to two significant figures.
6. This limitation does not apply to the Sacramento River and its tributaries above the State Highway 32 Bridge at Hamilton City. See Table III-1 of the Basin Plan for the Sacramento and San Joaquin River Basins for copper limitation.

The copper limitation in Order No. 2004-0009-DWQ was based on the CTR's Criteria Continuous Concentration (CCC) expressed in total recoverable concentration. This General Permit also uses CCC from the CTR as the basis of the copper limitations; however, the copper limitation is now expressed in dissolved concentration. Since the copper criterion in the CTR is expressed in dissolved concentration, the receiving water limitation must also be expressed in dissolved rather than total concentration since it is the dissolved portion of copper that is bioavailable to aquatic life.

Based on Policy section 5.3, this General Permit grants public entities and mutual water companies listed in Attachment G a short-term or seasonal exception from meeting receiving water limitations for acrolein and copper during treatment. As a condition of the exception, this General Permit requires Dischargers to provide the length and justification of required exception periods in their APAPs. There is no discrete definition for short-term; but the intent is to allow the exception to apply during the treatment period. It is up to the Discharger to make this demonstration.

The receiving water dissolved oxygen limitation is based on the Regional Water Board Basin Plans' dissolved oxygen objectives.

2. **Receiving Water Monitoring Triggers**

In algaecide or aquatic herbicide applications, it is reasonable to conclude that some residual algaecides or aquatic herbicides will remain in the receiving waters. These residual algaecides or aquatic herbicides may cause toxicity to aquatic life. However, information regarding the specific amount of algaecide or aquatic herbicide residues (described below) in the receiving water as a result of direct applications for weed control is not adequate to develop receiving water limitations for these algaecides and aquatic herbicides. Therefore, this General Permit only contains Receiving Water Monitoring Triggers and/or monitoring requirements for these algaecides or aquatic herbicides. The monitoring triggers and monitoring data will be used to assess whether the discharges of these algaecide or aquatic herbicide residues have the reasonable potential to cause or contribute to an excursion of a water quality standard, including numeric and narrative objectives within a standard.

In the absence of adopted criteria, objectives, or standards, the State Water Board used U.S. EPA's Ambient Criteria for the Protection of Freshwater Aquatic

Life (Ambient Water Quality Criteria) which are directly applicable as a regulatory level to implement narrative toxicity limitations included in all Regional Water Board Basin Plans. Where adopted criteria, objectives, standards, or Ambient Water Quality Criteria are unavailable, the State Water Board used data from U.S. EPA's *Ecotoxicity Database* to develop the Receiving Water Monitoring Triggers to protect all beneficial uses of the receiving water.

For constituents that do not have Ambient Water Quality Criteria, the Instantaneous Maximum Receiving Water Monitoring Trigger is based on one-tenth of the lowest 50 Percent Lethal Concentration (LC50) from U.S. EPA's *Ecotoxicity Database*. Using one-tenth of the lowest LC50 as the receiving water monitoring trigger is consistent with the Central Valley Regional Water Board's Basin Plan approach when developing the Daily Maximum Limitation for algaecides or aquatic herbicides that do not have water quality criteria.

This General Permit may be re-opened to add receiving water limitations to the algaecides or aquatic herbicides listed below if the monitoring triggers are exceeded or the monitoring data indicate re-opening of the permit is appropriate. The following is a detailed discussion of toxicity data, applicable water quality criteria, and Receiving Water Monitoring Triggers, if applicable, for these algaecide or aquatic herbicide:

a. Imazamox

Imazamox is a derivative of the active ingredient, ammonium salt of imazamox for the aquatic herbicide Clearcast, which DPR registered for use in California in October 2012. It is labeled for application to water for the control of submerged aquatic plants species and some emergent and floating species.

Imazamox is an herbicide that inhibits an enzyme in aquatic plants that is essential for the synthesis of three-branched chain amino acids.

Staff obtained toxicity data for imazamox from U.S. EPA's *Ecotoxicity Database* to assess its toxicity to freshwater aquatic life. However, U.S. EPA's *Ecotoxicity Database* contains toxicity data only for imazamox, but not for its salt. Table D-3 summarizes the toxicity data for imazamox below.

**Table D-3. Toxicity Data Summary for Imazamox (CAS# 114311-32-9)**

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| Mysid | 96 h | 1998 | > 100 |
| | | 1998 | > 94.3 |
| Bluegill sunfish | 96 h | 1994 | > 119 |
| Rainbow trout | 96 h | 1994 | > 122 |
| Sheephead mino | 96 h | 1998 | > 94.2 |
| | | 1998 | > 94.2 |
| **Lowest LC50/10 > 9.4 mg/L** | | | |

Ambient Water Quality Criteria are unavailable for imazamox and imazamox salt. Table D-3 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for imazamox is greater than 9.4 mg/l.

Due to the absence of water quality criteria for imazamox and its low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, this General Permit does not have a receiving water monitoring trigger for imazamox. However, this General Permit requires receiving water monitoring for imazamox to collect data, which will provide information on whether the use of imazamox has water quality impacts.

b. Imazapyr

The active ingredient imazapyr is marketed by the trade names Arsenal, Chopper, and Assault. Upon contact, imazapyr can interfere with DNA synthesis and cell growth of the plants. The target weed species are grasses, broad-leaves, vines, brambles, shrubs and trees, and riparian and emerged aquatics. The result of exposure is death of new leaves. It was first registered in the United States in 1984.

Imazapyr is a slow-acting amino acid synthesis inhibitor. It has an average water half-life* of four days with photodegradation as the primary form of degradation in water. Imazapyr acts more quickly and is less toxic than other low-volume herbicides. According to the San Francisco Estuary* Invasive Spartina Project's May 4, 2005 report titled *Use of Imazapyr Herbicide to Control Invasive Cordgrass (Spartina spp.) in the San Francisco Estuary*, imazapyr in water rapidly degrades via photolysis. The report further states that a number of field studies demonstrated that imazapyr rapidly dissipated from water within several days, and no detectable residues of imazapyr were found in either water or sediment within two months; in estuarine systems, dilution of imazapyr with the incoming tides contributes to its rapid dissipation, suggesting that imazapyr is not environmentally persistent in the estuarine environment and does not result in significant impacts to water quality. The report concludes that imazapyr herbicides can be a safe, highly effective treatment for control and eradication of non-native *Spartina* species in the San Francisco Estuary and offers an improved risk scenario over the existing treatment regime with glyphosate herbicides. On August 30, 2005, DPR registered imazapyr for aquatic application as an aquatic herbicide.

Toxicity data for imazapyr were obtained from U.S. EPA's *Ecotoxicity Database* to assess the toxicity of imazapyr to freshwater aquatic life. Tables D-4 and D-5 summarize the toxicity data for imazapyr and imazapyr salt.

**Table D-4. Toxicity Data Summary for Imazapyr (CAS#81334-34-1)**

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| Pink shrimp | 96 h | 1988 | > 189 |
| Atlantic silverside | 96 h | 1988 | > 184 |
| Bluegill sunfish | 96 h | 1983 | > 100 |
| | | 1983 | > 100 |

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| Channel catfish | 96 h | 1983 | > 100 |
| Rainbow trout | 96 h | 1983 | > 100 |
| | | 1995 | > 110 |
| **Lowest LC50/10 > 10** | | | |

**Table D-5. Toxicity Data Summary for Imazapyr Isopropylamine Salt (CAS#81510-83-0)**

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| Water flea | 48 h | 1984 | 350 |
| Rainbow trout | 96 h | 1984 | **112** |
| Bluegill sunfish | 96 h | 1984 | > 1000 |
| **Lowest LC50/10 = 11.2** | | | |

Ambient Water Quality Criteria are unavailable for imazapyr and imazapyr salt. Tables D-4 and D-5 show that the lowest one-tenth of LC50 to protect the most sensitive freshwater aquatic life for imazapyr is 11.2 mg/l.

Due to its safe use in the environment and low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, this General Permit does not have a receiving water limitation for imazapyr. However, this General Permit contains a monitoring trigger of 11.2 mg/l based on one-tenth of the lowest LC50 from U.S. EPA's *Ecotoxicity Database* and requires receiving water monitoring to collect data, which will provide information on whether imazapyr has water quality impacts.

c. Penoxsulam

Penoxsulam is the active ingredient for Galleon SC, a selective systemic aquatic herbicide for management of freshwater aquatic vegetation in ponds, lakes, reservoirs, marshes, wetlands, non-irrigation canals, slow-moving water bodies, etc. Penoxsulam is a post-emergence acetolactate synthase (ALS) inhibitor developed by Dow AgroSciences to be used as a foliar spray on dry-seeded rice crops. The mode of action is to inhibit the acetolactate synthases enzyme in the target weed.

The U.S. EPA Pesticide Fact Sheet states that penoxsulam is expected to be very mobile, but not very persistent, in either aqueous or terrestrial environments. Penoxsulam exists almost exclusively in a disassociated state at pH values normally found in rice paddy water (averaging about eight), but not in terrestrial environments where lower pH values may be found. Penoxsulam degrades by two different transformation mechanisms, producing 13 different identified transformation products, 11 of which meet

the criteria to be classified as major degradation byproducts,[11] six of which reached peak concentrations at study termination, indicating a greater degree of persistence than penoxsulam and a potential to reach concentrations even greater than those reported at study termination. The results of the screening-level risk assessment suggest that penoxsulam will not pose a threat to aquatic or terrestrial animals, however, this conclusion must be tempered by the fact that testing has not been conducted on several major degradation byproducts.

Toxicity data for penoxsulam were obtained from U.S. EPA's *Ecotoxicity Database* to assess the toxicity of penoxsulam to freshwater aquatic life. Table D-6 summarizes the toxicity data for penoxsulam.

**Table D-6. Toxicity Data Summary for Penoxsulam (CAS#219714-96-2)**

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| Bluegill sunfish | 96 h | 2000 | > 103 |
| Common carp fish | 96 h | 2001 | > **101** |
| Mysid | 96 h | 2000 | > 114 |
| Rainbow trout | 96 h | 2002 | > 147 |
| | | 2000 | > 102 |
| Scud | 96 h | 2000 | > 126 |
| **Lowest LC50/10 > 10.1** | | | |

Ambient Water Quality Criteria are unavailable for penoxsulam. Table D-6 shows that the lowest one-tenth of LC50 to protect the most sensitive freshwater aquatic life for penoxsulam is greater than 10.1 mg/l.

Due to its safe use in the environment, low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database,* and lack of accurate toxicity value, this General Permit does not have a receiving water monitoring trigger. However, this General Permit requires receiving water monitoring to collect data, which will provide information on whether penoxsulam has water quality impacts.

d. Sodium Carbonate Peroxyhydrate

Sodium carbonate hydroxyhydrate has been registered as an algaecide since early 2006. The most common brand names are PAK 27, Phycomycin, and Green Clean. It is an alternative to traditional copper based algaecides. It acts as an oxidizing agent and thus kills the target algae. When it is

[11] U.S. EPA defines major degradation byproducts to be BSA, 2-amino-TP, TPSA, BSTCA methyl, BSTCA, 2-amino-TCA,5-OH-penoxsulam, SFA, sulfonamide, 5,8-di-OH and 5-OH, 2 aminoTP.

applied into water, the compound quickly breaks down into hydrogen peroxide ($H_2O_2$) and sodium carbonate. The hydrogen peroxide oxidizes and thus kills the target pests. After contact, the hydrogen peroxide breaks down into water and oxygen.

U.S. EPA has waived toxicity testing for freshwater fish and invertebrate during the registration process. According to the U.S. EPA fact sheet, when the pesticide is applied in accordance with directions on the label, no harm is expected to freshwater fish or freshwater invertebrates.

There are no toxicity data for sodium carbonate peroxyhydrate in U.S. EPA's *Ecotoxicity Database.* Therefore, this General Permit does not have a monitoring trigger or a monitoring requirement for sodium carbonate peroxyhydrate.

e. Triclopyr Triethylamine (TEA) Salt

Triclopyr TEA is a systemic herbicide used to control broad-leaf weeds and woody plants.

U.S. EPA concluded in its re-registration document that triclopyr TEA is practically non-toxic to freshwater fish and aquatic invertebrates on an acute basis and triclopyr TEA is slightly toxic to practically non-toxic to estuarine/marine fish and invertebrates on an acute basis.

Triclopyr produces the metabolite or degradate 3,5,6-trichloro-2-pyridinol (TCP). Based on its analysis, U.S. EPA concludes that the existing uses of triclopyr are unlikely to result in acute or chronic dietary risks from TCP. Based on limited available data and modeling estimates, with less certainty, the U.S. EPA concluded that existing uses of triclopyr are unlikely to result in acute or chronic drinking water risks from TCP.

Toxicity data for triclopyr TEA were obtained from U.S. EPA's *Ecotoxicity Database* to assess the toxicity of triclopyr TEA to freshwater aquatic life. Table D-7 summarizes the toxicity data for Triclopyr TEA.

**Table D-7. Toxicity Data Summary for Triclopyr TEA Salt (CAS#57213-69-1)**

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| Bluegill sunfish | 96 h | 1978 | 891 |
| | 96 h | 1973 | 471 |
| Fathead minnow | 96 h | 1978 | 947 |
| | 96 h | 1983 | 546 |
| | 96 h | 1983 | 279 |
| Grass shrimp | 96 h | 1992 | 326 |
| Inland Silverside fish | 96 h | 1989 | **130** |
| Pink shrimp | 96 h | 1975 | 895 |
| Rainbow trout | 96 h | 1973 | 240 |
| | 96 h | 1978 | 552 |

| Type of Organism | Study Length | Study Date | LC50 (mg/L) |
|---|---|---|---|
| **Lowest LC50/10 = 13.0** | | | |

Ambient Water Quality Criteria are unavailable for triclopyr TEA. Table D-7 shows that the lowest one-tenth of LC50 to protect the most sensitive freshwater aquatic life for triclopyr TEA is 13 mg/l.

Due to its safe use in the environment and low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, this General Permit does not have a receiving water limitation for triclopyr TEA. However, this General Permit contains a monitoring trigger of 13.0 mg/l based on one-tenth of the lowest LC50 from U.S. EPA's *Ecotoxicity Database* and requires receiving water monitoring to collect data, which will provide information on whether triclopyr TEA has water quality impacts.

## VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

### A. MRP Goals

Section 122.48 of 40 C.F.R. requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the State and Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) in Attachment C of this General Permit establishes monitoring and reporting requirements to implement federal and state requirements.

The goals of the MRP are to:

1. Identify and characterize algaecide or aquatic herbicide application projects conducted by the Discharger;
2. Determine compliance with the receiving water limitations and other requirements specified in this General Permit;
3. Measure and improve the effectiveness of the APAP;
4. Support the development, implementation, and effectiveness of BMPs;
5. Assess the chemical, physical, and biological impacts on receiving waters resulting from algaecide or aquatic herbicide applications;
6. Assess the overall health and evaluate long-term trends in receiving water quality;
7. Demonstrate that water quality of the receiving waters following completion of resource or weed management projects are equivalent to pre-application conditions; and
8. Ensure that projects that are monitored are representative of all algaecide or aquatic herbicide and application methods used by the Discharger.

The MRP in the Attachment C of this General Permit is considered as baseline monitoring requirements. Monitoring plans proposed by Dischargers in their APAP must meet the minimum requirements prescribed in the MRP. Public entities and mutual water companies that have a Policy section 5.3 exception should comply with the MRP in this General Permit as well as monitoring plan proposed in their CEQA document where the two plans differ.

## B. Effluent Monitoring

Pursuant to the requirements of 40 C.F.R. section 122.44(i), effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and assess the impacts of the discharge on the receiving water and groundwater.

The application of pesticides for pest control is not necessarily considered a discharge of pollutants according to the *National Cotton Council of America v. U.S. EPA* decision and other applicable case law. The regulated discharge is the discharge of residual pesticides. At what point the pesticide becomes a residue is not precisely known. Therefore, in the application of pesticides, the exact effluent is unknown. Thus, the effluent monitoring requirement is not applicable for algaecide or aquatic herbicide applications.

## C. Toxicity Testing Requirements

The State Water Board, pursuant to the Porter-Cologne Act and the federal CWA, customarily requires the Discharger to conduct toxicity monitoring. In fact, both Acts anticipate Discharger self monitoring. However, this General Permit does not require toxicity testing based on the 2004 toxicity study funded by the State Water Board and data collected from 2004 to 2008. The toxicity study found the following: (1) There was no toxicity with the use of 2,4-D, glyphosate, and triclopyr; (2) Toxicity testing was difficult for acrolein due to its volatility; (3) Results were inconclusive for diquat and fluridone; and (4) Peak copper concentrations did not exceed toxicity values. The monitoring data collected under Order No. 2004-0009-DWQ from 2004 to 2008 showed that all constituent concentrations from post-event application samples were below receiving water limitations except for the following: three exceedances each for acrolein and glyphosate and 82 exceedances for copper out of 288 monitoring events. For glyphosate, it is likely that the three exceedances were not the result of aquatic herbicide applications because the pre-application samples also showed exceedances and the remaining 151 samples showed no exceedance. For copper, 43 of the 82 exceedances were from public agencies or mutual water companies that were excepted from meeting priority pollutant limitations during the exception period. The Policy allows the exception. Thus, staff did not consider these exceedances as violations of the receiving water limitations. However, 39 of the exceedances were from entities that did not have a Policy exception. Although staff considered these exceedances as true violations of the receiving water limitations, staff is not aware of any long-term impacts from these exceedances. Long-term impacts from

exceedances are likely not going to occur for the following reasons: (1) water quality criteria, which are used directly as receiving water limitations in this General Permit, have built-in factors of safety; (2) as shown in the 2004 toxicity study, the actual peak concentrations after applications of copper did not exceed toxicity values; and (3) the applications are short-term in duration. All of the foregoing information indicates that widespread acute ecosystem impacts will not occur from algaecide or aquatic herbicides applied according to their label instructions and requirements of this General Permit. Therefore, toxicity monitoring requirements are not necessary.

### D. Receiving Water Monitoring

Receiving water monitoring is necessary to determine the impacts of the discharge on the receiving stream.

All forms of testing have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty. The intent of this General Permit's sampling program is to select a number that will detect most events of noncompliance without requiring needless or burdensome monitoring.

Staff also used EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) to determine the appropriate number of samples that would be needed to characterize the impacts of the residual pesticide discharge from pesticide applications. Page 53 of the TSD recommends using a coefficient of variation (CV) 0.6 when the data set contains less than 10 samples. Table 3-1 of the TSD shows that with a CV of 0.6, the multiplying factors used to determine whether a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a state water quality standard begin to stabilize when the sample number is six. Thus, this General Permit requires six samples per year for each active ingredient in each environmental setting (flowing water and non-flowing water) to characterize the effects of residual pesticide discharge from pesticide applications. However, after a Discharger or Coalition has provided results from six consecutive sampling events showing concentrations that are less than the receiving water limitation/trigger for an active ingredient in a specific environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting.

Similarly, this General Permit contains a reduced monitoring frequency of once per year (instead of six) at each environmental setting for glyphosate. The reduced monitoring frequency is based on staff's review of available data from 2004 to 2008 that showed no exceedance of the permit limitation for glyphosate under Order No. 2004-0009-DWQ.

## VIII. RATIONALE FOR AQUATIC PESTICIDE USE REQUIREMENTS

### A. Application Schedule

The Discharger shall provide a phone number or other specific contact information for all persons who request the Discharger's application schedule.

### B. Application Notification Requirements

The Policy section 5.3, Categorical Exception, requires public agencies and mutual water companies that have been granted the short-term or seasonal exception for compliance with priority pollutant limitations to notify potentially affected public and government agencies of algaecide or aquatic herbicide application.

### C. APAP

This General Permit contains narrative effluent limitations, which include implementing BMPs described in the APAP, which is a requirement of this General Permit. See Section VI, Rationale for Effluent Limitations and Discharge Specifications, for more detailed explanation of the need for an APAP.

### D. APAP Processing, Approval, and Modifications

Upon receipt of a new or an amended APAP, staff will post it on the State Water Board's website. Major changes to the APAP shall be submitted to the Deputy Director for approval. Examples of major changes include using a different product other than what is specified in the APAP, changing an application method that may result in different amounts of algaecide or aquatic herbicides being applied, or adding or deleting BMPs. Since the APAP shall include ALL (1) the water bodies or water body systems in which algaecide or aquatic herbicides are being planned to be applied or may be applied to control algae and aquatic weeds and (2) the application areas and the target areas in the system that are being planned to be applied or may be applied, changes in monitoring locations are not considered major changes. However, these changes need to be reported in the annual report.

In preparing for the reissuance of the General Permit, staff will evaluate review periods and comments received during the life of this permit and look for efficiencies. Based on this information, staff will propose revisions to the public comment process for APAPs.

### E. Aquatic Pesticide Application Log

An application log to record all algaecide or aquatic herbicide applications is necessary. This application log will help Dischargers and the Water Boards' staff to investigate any exceedance of receiving water limitations or receiving water monitoring triggers.

## IX. RATIONALE FOR PROVISIONS

### A. Standard Provisions

#### 1. Standard Provisions in Attachment B

Standard Provisions, which apply to all NPDES permits in accordance with 40 C.F.R. section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 C.F.R. section 122.42, are provided

in Attachment B. The Discharger must comply with applicable standard provisions and with those additional conditions that are applicable under 40 C.F.R. section 122.42.

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the General Permit. Section 123.25(a)(12) of 40 C.F.R. allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R. Section 123.25, this General Permit omits federal conditions that address enforcement authority specified in 40 C.F.R. section 122.41(j)(5) and (k)(2) because the enforcement authority under the California Water Code is more stringent. In lieu of these conditions, this General Permit incorporates by reference California Water Code section 13387(e).

2. **Discharge to Impaired Water Bodies**

Impaired water bodies are water quality limited segments listed under CWA 303(d) listings. The water bodies on these lists do not meet water quality standards, even if the discharge itself meets water quality standards. The Basin Plans state that "*Additional treatment beyond minimum federal standards will be imposed on dischargers to Water Quality Limit Segments. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" The allocated loads are Discharger and receiving water specific. It is infeasible to assign a uniform load in a statewide general permit. Therefore, this General Permit does not authorize the discharge of active ingredients of algaecides or aquatic herbicides, their residues, and their degradation byproducts to water bodies that are already impaired due to the same product active ingredients, their residues, and their degradation byproducts.

## B. Special Provisions

1. **Reopener Provisions**

The reopener provisions allow future modification to this General Permit in accordance with 40 C.F.R. section 122.62.

a. Addition to Policy Exception List in Attachment G

This General Permit may be reopened to add a public entity or a mutual water company which may not otherwise meet the receiving water limitations for acrolein and copper and meets the requirements for an exception from meeting those limitations, consistent with section 5.3 of the Policy.

b. Addition of Aquatic Pesticide Active Ingredients

This General Permit may be reopened to add newly registered algaecide or aquatic herbicide active ingredients so that Dischargers can be covered by this General Permit when they apply the algaecide or aquatic herbicide products with the new active ingredients.

c. Acute and Chronic Toxicity

When the State Water Board revises the Policy's toxicity control provisions that would require the establishment of numeric chronic toxicity limitations or other actions, this General Permit may be reopened to comply with those requirements.

d. Receiving Water Limitations

If monitoring data for residual pesticides show exceedance of monitoring triggers, the Discharger or Coalition shall conduct additional investigations to determine the cause of exceedance. At a minimum, the Discharger or Coalition shall evaluate its application methods, BMPs, and the appropriateness of using alternative products. As a result of the evaluation, this General Permit may be re-opened to add numeric Receiving Water Limitations for the residual pesticides exceeding the triggers.

e. Endangered Species Act

If U.S. EPA develops biological opinions regarding pesticides included in this General Permit, this General Permit may be re-opened to add or modify Receiving Water Limitations/Monitoring Triggers for residual pesticides of concern, if necessary.

2. **Special Studies, Technical Reports, and Additional Monitoring Requirements**

a. Additional Investigation

This General Permit requires Dischargers to conduct additional investigations if the monitoring results exceed the receiving water monitoring limitations. These investigations are necessary in order to address the exceedance caused by the algaecide or aquatic herbicide application and meet the General Permit's limitations and requirements including Basin Plans' narrative water quality objective of no toxics in toxic amount.

b. Qualified Biologist Certification Following Project Completion

The requirement is retained from Order No. 2004-0009-DWQ and is based on Policy section 5.3 exception.

3. **Corrective Action**

When receiving water limitations or triggers are exceeded, Dischargers are expected to assess the cause of exceedance and take appropriate actions as necessary to prevent recurrence of the problem.

## X. COMPLIANCE DETERMINATION

This General Permit specifies that compliance be based on event and post-event sampling results. The event sample results will determine if exceedance occurred outside the Treatment Area* during treatment. Post-event samples will determine if exceedance occurred in the Application or Treatment Area after treatment. Since the minimum effective concentration and time needed to effectively kill or control target weeds or algae vary due

to site specific conditions, such as flow, target species, water chemistry, and type of algaecides or aquatic herbicides, this General Permit allows Dischargers to determine when treatment is completed.

## XI. PUBLIC PARTICIPATION

The State Water Board is considering the issuance of WDRs that will serve as a general NPDES permit for algaecide or aquatic herbicide applications. As a step in the WDR adoption process, the State Water Board staff has developed tentative WDRs. The State Water Board encourages public participation in the WDR adoption process.

### A. Notification of Interested Parties

The State Water Board has notified interested agencies, parties, and persons of its intent to prescribe general WDRs for algaecide or aquatic herbicide applications and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided to interested parties through specific mailings and publication in major newspapers throughout California. The State Water Board, in a public meeting, heard and considered all comments pertaining to discharges to be regulated by this General Permit. Details of the Public Hearing are provided in the Fact Sheet of this General Permit.

### B. Written Comments

Interested persons were invited to submit written comments concerning this tentative WDR. Comments were due at the State Water Board offices by 12:00 noon on **August 21, 2012**. Seven comment letters were received.

### C. Public Hearing and Meeting

The State Water Board held a public hearing on the tentative WDRs during its regular Board meeting on **August 7, 2012**. The State Water Board will consider adoption of the WDRs at a public meeting on the following date, time, and location:

| | |
|---|---|
| Date: | **February 19, 2013** |
| Time: | 9:00 a.m. |
| Location: | State Water Resources Control Board<br>1001 I Street<br>Sacramento, CA 95814 |

Interested persons are invited to attend. At the public meeting, the State Water Board will hear comments, if any, limited to changes on the draft General Permit.

Please be aware that dates and venues may change. The State Water Board's website address is www.waterboards.ca.gov where you can access the current agenda for changes in dates and locations.

## D. Information and Copying

The tentative effluent limitations, receiving water limitations, and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the State Water Board by calling (916) 379-9152.

## E. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding this general WDR and NPDES permit should contact the State Water Board, reference the general WDR and NPDES permit, and provide a name, address, and phone number.

## F. Additional Information

Requests for additional information or questions regarding this General Permit should be directed to NPDES_Wastewater@waterboards.ca.gov.

# Attachment E – Notice of Intent

## WATER QUALITY ORDER NO. 2013-0002-DWQ
## GENERAL PERMIT NO. CAG990005

## STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

### I. NOTICE OF INTENT STATUS (see Instructions)

| | | | |
|---|---|---|---|
| Mark only one item | A. New Applicator | B. Change of Information: WDID# _____ | |
| | C. ☐ Change of ownership or responsibility: WDID# _____ | | |

### II. DISCHARGER INFORMATION

| | | | |
|---|---|---|---|
| A. Name | | | |
| B. Mailing Address | | | |
| C. City | D. County | E. State | F. Zip |
| G. Contact Person | H. E-mail address | I. Title | J. Phone |

### III. BILLING ADDRESS (Enter Information *only* if different from Section II above)

| | | | |
|---|---|---|---|
| A. Name | | | |
| B. Mailing Address | | | |
| C. City | D. County | E. State | F. Zip |
| G. E-mail address | H. Title | I. Phone | |

## IV. RECEIVING WATER INFORMATION

A. Algaecide and aquatic herbicides are used to treat (check all that apply):

1. ☐ Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.
   Name of the conveyance system: _____
2. ☐ Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger.
   Owner's name:_____
   Name of the conveyance system: _____
3. Directly to river, lake, creek, stream, bay, ocean, etc.
   Name of water body: _____

B. Regional Water Quality Control Board(s) where treatment areas are located (REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region _____
(List all regions where algaecide and aquatic herbicide application is proposed.)

## V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: ____

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients

C. Period of Application: Start Date_____ End Date_____

D. Types of Adjuvants Used:

## VI. AQUATIC PESTICIDE APPLICATION PLAN

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents?
☐ Yes ☐ No

If not, when will it be prepared? _____

## VII. NOTIFICATION

Have potentially affected public and governmental agencies been notified? ☐ Yes ☐ No

## VIII. FEE

Have you included payment of the filing fee (for first-time enrollees only) with this submittal?
☐ YES ☐ NO ☐ NA

**IX. CERTIFICATION**

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the General Permit, including developing and implementing a monitoring program, will be complied with."

**A. Printed Name:** _____

**B. Signature:** _____ **Date:** _____

**C. Title:** _____

**XI. FOR STATE WATER BOARD STAFF USE ONLY**

| | | |
|---|---|---|
| **WDID:** | **Date NOI Received:** | **Date NOI Processed:** |
| **Case Handler's Initial:** | **Fee Amount Received:**<br>**$** | **Check #:** |
| ☐ **Lyris List Notification of Posting of APAP** | **Date** _____ | **Confirmation Sent** _____ |

## INSTRUCTIONS FOR COMPLETING NOI

## WATER QUALITY ORDER NO. 2013-0002-DWQ
## GENERAL PERMIT NO. CAG990005

## STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

These instructions are intended to help you, the Discharger, to complete the Notice of Intent (NOI) form for the Statewide General NPDES permit. **Please type or print clearly when completing the NOI form**. For any field, if more space is needed, submit a supplemental letter with the NOI.

Send the completed and signed form along with the filing fee and supporting documentation to the Division of Water Quality, State Water Resources Control Board. Please also send a copy of the form and supporting documentation to the appropriate Regional Water Quality Control Board (Regional Water Board).

### ***Section I – Notice of Intent Status***

Indicate whether this request is for the first time coverage under this General Permit or a change of information for the discharge already covered under this General Permit. Dischargers that are covered under Order No. 2004-0009-DWQ before effective date of this General Permit should check the box for change of information. For a change of information or ownership, please supply the eleven-digit Waste Discharge Identification (WDID) number for the discharge.

### ***Section II – Discharger Information***

Enter the name of the Discharger.
Enter the street number and street name where correspondence should be sent (P.O. Box is acceptable).
Enter the city that applies to the mailing address given.
Enter the county that applies to the mailing address given.
Enter the state that applies to the mailing address given.
Enter the zip code that applies to the mailing address given.
Enter the name (first and last) of the contact person.
Enter the e-mail address of the contact person.
Enter the contact person's title.
Enter the daytime telephone number of the contact person

### ***Section III – Billing Address***

Enter the information **only** if it is different from Section II above.

**A.** Enter the name (first and last) of the person who will be responsible for the billing.

**B.** Enter the street number and street name where the billing should be sent (P.O. Box is acceptable).
**C.** Enter the city that applies to the billing address.
**D.** Enter the county that applies to the billing address.
**E.** Enter the state that applies to the billing address.
**F.** Enter the zip code that applies to the billing address.
**G.** Enter the e-mail address of the person responsible for billing.
**H.** Enter the title of the person responsible for billing.
**I.** Enter the daytime telephone number of the person responsible for billing.

## ***Section IV – Receiving Water Information***

Please be reminded that this General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. §1531 et. seq). This General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

Additional information on federally-listed threatened or endangered species and federally-designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species.

**A.** Check all boxes that apply. At least one box must be checked.
1. Check this box if the treatment area is a canal, ditch, or other constructed conveyance system owned and controlled by Discharger. Print the name of the conveyance system.
2. Check this box if the treatment area is a canal, ditch, or other constructed conveyance system owned and controlled by an entity other than the Discharger. Print the owner's name and names of the conveyance system.
3. Check this box if the treatment area is not a constructed conveyance system (including application to river, lake, creek, stream, bay, or ocean) and enter the name(s) of the water body(s).

**B.** List all Regional Water Board numbers where algaecide and aquatic herbicide application is proposed. Regional Water Board boundaries are defined in section 13200 of the California Water Code. The boundaries can also be found on our website at http://www.waterboards.ca.gov/waterboards_map.shtml

| Regional Water Board Numbers | Regional Water Board Names |
|---|---|
| 1 | North Coast |
| 2 | San Francisco Bay |
| 3 | Central Coast |

| Regional Water Board Numbers | Regional Water Board Names |
|---|---|
| 4 | Los Angeles |
| 5 | Central Valley (Includes Sacramento, Fresno, Redding Offices) |
| 6 | Lahontan (South Lake Tahoe, Victorville offices) |
| 7 | Colorado River Basin |
| 8 | Santa Ana |
| 9 | San Diego |

***Section V – Algaecide and Aquatic Herbicide Application Information***

**A.** List the appropriate target organism(s).
**B.** List the name and active ingredients of each algaecide and aquatic herbicide to be used.
**C.** List the start and end date of proposed aquatic algaecide and aquatic herbicide application event.
**D.** List the name(s) and type(s) of adjuvants that will be used.

The Discharger must submit a new NOI if any information stated in this section will be changed. If the Discharger plans to use an algaecide and aquatic herbicide product not currently covered under its Notice of Applicability (NOA), and the algaecide and aquatic herbicide product may be discharged to a water of the United States as a result of algaecide and aquatic herbicide application, the Discharger must receive a revised NOA from the State Water Board's Deputy Director of the Division of Water Quality before using that product.

***Section VI – Aquatic Pesticide Application Plan***

The Coalition or Discharger must prepare and complete an Aquatic Pesticide Application Plan (APAP). The minimum contents of APAP are specified in the permit under Section VIII.C, Limitations and Discharge Requirements, of the General Permit. The Discharger must ensure that its applicator is familiar with the APAP contents before algaecide and aquatic herbicide application.

If an APAP is not complete at the time of application, enter the date by which it will be completed.

***Section VII – Notification***

Indicate if you have notified potentially affected public and governmental agencies, as required under item VIII.B of the General Permit.

***Section VIII – Fee***

The amount of Annual fee shall be based on Category 3 discharge specified in section 2200(b)(9) of title 23, California Code of Regulations. Fee information can be found at http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl_npdes_prmt.pdf.

Check the YES box if you have included payment of the annual fee. Check the NO box if you have not included this payment. **NOTE:** You will be billed annually and payment is required to continue coverage.

***Section IX– Certification***

**A.** Print the name of the appropriate official. The person who signs the NOI must meet the signatory and certification requirements stated in Attachment B Standard Provisions item V.B.
**B.** The person whose name is printed above must sign and date the NOI.
**C.** Enter the title of the person signing the NOI.

## Attachment F – Notice of Termination

**WATER QUALITY ORDER NO. 2013-0002-DWQ**
**GENERAL PERMIT NO. CAG990005**

**STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS**

### I. WDID

| |
|---|
| WDID# _____ |

### II. DISCHARGER INFORMATION

| | | | |
|---|---|---|---|
| A. Name | | | |
| B. Mailing Address | | | |
| C. City | D. County | E. State | F. Zip |
| G. Contact Person | H. E-mail address | I. Title | J. Phone |

### III. BASIS FOR TERMINATION

| |
|---|
| |

## IV. CERTIFICATION

"I certify under penalty of law that 1) I am not required to be permitted under this General Permit No.CAG990005, and 2) this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I understand that the submittal of this Notice of Termination does not release an algaecide or aquatic herbicide applicator from liability for any violations of the Clean Water Act."

**A. Printed Name:** _____

**B. Signature:** _____ **Date:** _____

**C. Title:** _____

## V. FOR STATE WATER BOARD USE ONLY

☐ **Approved for Termination** ☐ **Denied and Returned to the Discharger**

**A. Printed Name:** _____

**B. Signature:** _____

**C. Date:** _____

**NOT Effective Date:** / /

## Attachment G – Exception List

## LIST OF PUBLIC AGENCIES AND MUTAL WATER COMPANIES GRANTED AN EXCEPTION PURSUANT TO STATE WATER RESOURCES CONTROL BOARD POLICY FOR IMPLEMENTATION OF TOXICS STANDARDS FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES OF CALIFORNIA

The public entities and mutual water companies listed herein have prepared Initial Studies, Negative Declarations (ND), Mitigated Negative Declarations (MND), and Notices of Determination for the discharge of algaecides and aquatic herbicides in accordance with the California Environmental Quality Act (CEQA (Public Resources Code § 21000 et seq.)) to comply with the exception requirements of section 5.3 of the Policy. The boards of each public entity, as the lead agencies under CEQA, approved the Final ND/MND and determined that the discharge of algaecides and aquatic herbicides in their respective projects would not have a significant effect on the environment. These public entities and mutual water companies have determined that the water quality or related water quality impacts identified in the environmental assessments of the ND/MND are less than significant.

In addition to submitting the CEQA documentation, these public entities and mutual water companies have also complied with the other exception requirements of section 5.3 of the Policy.

As required in section 15096 of the CEQA Guidelines, the State Water Resources Control Board (State Water Board), as a Responsible Agency under CEQA, considered the ND/MND approved by the board of each public entity and finds that the projects will have less than significant water quality impact if the waste discharge requirements in this General Permit are followed. Accordingly, the public entities and mutual water companies listed herein are hereby granted an exception pursuant to section 5.3 of the Policy.

1. Byron-Bethany Irrigation District
2. City of Antioch Department of Public Works
3. Contra Costa Water District
4. Contra Costa County Flood Control and Water Conservation District
5. Department of Food and Agriculture
6. Department of Water Resources
7. Friant Water Users Authority
8. Glenn-Colusa Irrigation District
9. Maine Prairie Water District
10. Marin Municipal Water District
11. Metropolitan Water District of Southern California
12. Modesto Irrigation District
13. Nevada Irrigation District

14. North Marin Water District
15. Oakdale Irrigation District
16. Placer County Water Agency
17. Potter Valley Irrigation District
18. Princeton-Cordora-Glenn Irrigation District
19. Provident Irrigation District
20. Reclamation District 1004
21. Santa Cruz Water Department
22. Solano Irrigation District
23. South Feather Water and Power Agency
24. South Sutter Water District
25. Tehama Colusa Canal Authority
26. Turlock Irrigation District
27. Woodbridge Irrigation District
28. Yolo County Flood Control and Water Conservation District

# USFWS SCP
# Biological Opinion
## (forthcoming)

# NMFS SCP
# Letter of Concurrence

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4700

MAY 28 2014 **Refer to NMFS No: 2014-394**

Dr. Raymond I. Carruthers
Research Leader and Scientist
USDA-Agricultural Research Service
800 Buchanan Street
Albany, California 94710

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response and Fish and Wildlife Coordination Act Recommendations for the Spongeplant Control Program

Dear Dr. Carruthers:

On February 2, 2014, NOAA's National Marine Fisheries Service (NMFS) received your request for a written concurrence that the U.S. Department of Agriculture (USDA) proposed 4-year (2014-2017) Spongeplant Control Program (SCP) in the Sacramento-San Joaquin Delta (Delta) and its tributaries is not likely to adversely affect (NLAA) species listed as threatened or endangered or critical habitats designated under the Endangered Species Act (ESA). USDA serves as the Federal nexus for a cooperative project with its applicant, the California Department of Parks and Recreation, Division of Boating and Waterways (CDBW), with regard to managing invasive plants in the Delta and its tributaries and providing research and scientific expertise. This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for preparation of letters of concurrence.

NMFS also reviewed the proposed action for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including conservation measures and any determination you made regarding the potential effects of the action. This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. In this case, NMFS concluded that the action would not adversely affect EFH. Thus, consultation under the MSA is not required for this action.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The concurrence letter will be available through NMFS' Public Consultation

Tracking System (https://pcts.nmfs.noaa.gov/ptcs-web/homepage.pcts)[1]. A complete record of this consultation is on file at California Central Valley Area Office in Sacramento, California.

## DESCRIPTION OF THE PROPOSED ACTION

USDA and CDBW propose to use chemical treatment methods, supported by physical removal methods, as the primary methods to control spongeplant in the Delta, its tributaries, and the Suisun Marsh. USDA and CDBW propose to use seven herbicide products: Roundup Custom, Rodeo, Aquamaster, Weeder 64, Galleon SC, Clearcaste, and Reward. The products contain one of the five active ingredients (a.i.): glyphosate, 2,4-D, penoxsulam, imazamox, and diquat. To increase adhesion to spongeplant leaves, CDBW will apply herbicides with adjuvants Agridex and Competitor. Agridex has been use for several years in the Water Hyacinth Control Program (WHCP). CDBW will use Competitor if there is difficulty in obtaining a supply of Agridex. Table 1 provides the environmental effect concentrations (EEC) and environmental fates of the proposed herbicides and adjuvants. All herbicides have been approved for use in the WHCP or *Egeria densa* Control Program (NMFS 2013a and 2014).

Table 1. Environmental effect concentration and environmental fate of the proposed herbicides and adjuvants.

| Product(s)® | Active Ingredient (a.i.) | Estimated Environmental Concentration (mg/L) | | *Waiting Time Prior to a Second Treatment (day) | §Aquatic DT50 (day) | †Koc | ‡BCF |
|---|---|---|---|---|---|---|---|
| | | 1-meter | 2-meter | | | | |
| Roundup Custom, Rodeo, and Aquamater | Glyphosate | 0.113 | 0.057 | 1 | 12-10 | 300-20,100 | <1 |
| Weeder 64 | 2,4-D | 0.103 | 0.051 | 21 | 0.5-6.6 | 72-136 | 0.003 |
| Galleon SC | Penoxsulam | 0.002 | 0.001 | 10-14 | 1.5-14 | 13-305 | 100 |
| Clearcaste | Imazamox | 0.012 | 0.006 | 14 | 5-15 | NA | 0.1 |
| Reward | Diquat Dibromide | 0.049 | 0.023 | 14 | 2-21 | 100,000 | 1 |
| Agridex | Petroleum oil, emulsifier | 0.094 | 0.047 | Not applicable | Not available | Not available | Not available |
| Competitor | Ethyl ester of[2] oleic acid | 0.094 | 0.047 | Not applicable | 5.37 | 2,984 | 357 |

*These are label required waiting days before a second treatment starts.
§Aquatic DT50 is the estimated dissipation half-life of the active ingredient.
†$K_{oc}$ is soil organic carbon-water partitioning coefficient in units of g/mL.
‡ BCF is the bioconcentration factor

[1] Once on the PCTS homepage, use the following PCTS tracking number within the Quick Search column: WCR-2014-394, or search for the project by name: Spongeplant Control Program.

[2] Predicted for ethyl ester of oleic acid, the first listed ingredient of Competitor from USEPA's EPI Suite:http:www.chemspider.com/Chemical-Structure.4941004.html

The EEC in the water column is calculated using the maximum application rate, spray efficiency, and water depth. Spray efficiency is defined as the fraction of an a.i. intercepted by the target plant canopy. The amount of droplet capture will depend on the canopy coverage and the volume, speed and direction of the spray cloud. According to USDA, the typical spray efficiency is between 80 and 90 percent when applying 2,4-D to water hyacinth mats. NMFS assumes that the 1-meter water depth is appropriate for estimating the concentration of herbicide to which salmon and steelhead may be exposed and 2-meter water depth is appropriate for green sturgeon. Salmonid juveniles generally migrate or rear in the top layer of water column ranging from 3-6 meters while green sturgeon migrate or rear at the bottom of a water body. Use of 1 meter for salmonids and 2 meters estimated environmental effects concentrations for green sturgeon is conservatively protective of the species. The herbicide treatment concentrations needed to elicit effects to salmonids would need to be two to three orders of magnitude higher than those proposed in the SCP (USDA 2014, Table 1).

The maximum application rates and application methods for chemical and physical treatments are listed in Tables 2. Treatment areas will vary from year to year. In 2013, CDBW treated only one acre of spongeplant. USDA and CDBW estimate that they would treat a maximum of 1,000 acres/year of spongeplant in 2014 through 2017. To date, spongeplant has been identified in 20 different treatment sites, with no single infestation more than a fraction of an acre. Of the total proposed action area, the total herbicide application acreage represents a small fraction (1.5 percent annually and 5.8 percent over the four years of applications) of the total water acres in the Delta (~68,000). As an alternative to chemical treatment, USDA and CDBW propose to use hand removal with nets, herding, and mechanical removal by excavators to limit the growth and spread of spongeplant.

Table 2. Maximum application rates and application method for each of the proposed control methods for 2014-2017

| Control Method | Proposed Maximum Application Rate (pound a.i./acre) | Application method |
|---|---|---|
| Glyphosate | 5.06 | Nozzle and spot application |
| 2,4-D | 4.58 | Nozzle and spot application |
| Imazamox | 0.53 | Nozzle and spot application |
| Penoxsulam | 0.088 | Nozzle and spot application |
| Diquat | 1.0 | Nozzle and spot application |
| Agridex | 3.67 | Nozzle and spot application |
| Competitor | 3.68 | Nozzle and spot application |
| Hand Removal with Nets | Not applicable | Pool-skimmer nets |
| Herding | Not applicable | Aluminum frame with wire mesh |
| Mechanical Removal | Not applicable | Excavator/cutter and conveyor equipment |

**Procedure for Controlling Spongeplant**

There are a number of management activities that support the SCP. USDA staffing for the SCP will include a managing supervisor, administrative support, and scientific staff. Within CDBW, employees that work directly on the SCP will include a manager, a senior environmental scientist, field environmental scientists, a field supervisor, a GIS mapping specialist, and field crew members. CDBW may add or reduce staff to support program needs over time. The SCP also receives management and administrative support from the executive office within CDBW.

Prior to the start of each treatment season, USDA and CDBW will conduct environmental awareness training for all field crew members. The training will include: fish surveys, species identification and impact avoidance guidelines, protocol for identification and protection of Chinook salmon, steelhead, green sturgeon, and associated protected habitats. In addition, field crew members will be trained on use and calibration of equipment and the WHCP/SCP Operations Management Plan.

USDA and CDBW will implement pre- and post-season surveys to identify locations and coverage of spongeplant, and will supplement these formal surveys with mid-season evaluations of spongeplant coverage. Beginning in mid-February, in March through July, and again in the fall, field crews will conduct visual surveys of all potential treatment sites. For each site, crews will record the extent of spongeplant coverage (acres and percent coverage) and status of spongeplant at the site. In the early season survey, field crews will identify problem areas such as those with the greatest impact on navigation, public safety, nursery areas, and sites close to pumps or other structures. This survey information will be used to help prioritize treatment locations at the start of the treatment season, and to help measure efficacy of treatment at the end of the season. During the treatment season, as crews are working throughout the Delta, they will continue to monitor and record spongeplant coverage by site.

USDA and CDBW will prepare an annual report for the SCP and submit the report to NMFS by February 1 of each year, starting in 2015. This annual report will summarize infestation levels, treatment acreage and types, amount of each herbicide used, materials and methods, and water quality monitoring results [including concentrations of herbicides and dissolved oxygen (DO)]. NMFS will review the report and assess whether or not the SCP poses negative effects to listed anadromous fish species, their critical habitats, and EFH.

**Chemical Treatment**

USDA and CDBW propose to use seven herbicide products that contain one of the following five a.i. to control spongeplant: glyphosate, 2,4-D, penoxsulam, imazamox, and diquat. All herbicides will be applied with an adjuvant, either Agridex or Competitor. Diquat had been utilized in limited quantities in the EDCP prior to 2005; however since 2005 the a.i. has not been used. Due to its rapid mode of action, spot application of diquat at selected times and sites may reduce the overall amount of herbicide need to control spongeplant. Only one herbicide will be utilized in a given site for any single treatment.

Crews for herbicide application will conduct treatments with hand-held sprayers applied from aluminum airboats or aluminum outboard motor boats. The work boats will be equipped with direct metering of herbicides, adjuvants, and water pump systems. The crews will spray the chemical mixture directly onto the plants utilizing pump-driven hand-held spray nozzles. The pump will mix calibrated amounts of herbicide, adjuvant, and water.

USDA and CDBW will only treat those sites that have spongeplant infestations. Within a given treatment location, field crews will treat according to current herbicide label requirements or the fish passage protocol to limit the potential for the decay of plants to cause low DO levels.

USDA and CDBW will follow the fish passage protocol to ensure that during herbicide applications a zone of the treatment area is left untreated for passage of listed fish species at all times, taking into account the location and size of treatment areas.

Repeat treatments, when needed, may utilize the same, or a different herbicide, depending on conditions at the site, for example:

(1) A location will not be treated again if, after the herbicide has had time to take effect, the initial treatment was effective in killing the majority of spongeplant at that site.

(2) A given spongeplant mat will be treated a second time if buffer strips for fish passage were left untreated. In this case, CDBW will return to treat the remainder of the site after the specified time (Table 1) between treatments, per herbicide label requirements or the fish passage protocol, whichever is more protective of listed fish species. In this case, new plants within a given spongeplant mat will be treated, not the previously treated plants. The acreage of the second treatment is added to the acreage of the first treatment, so that in total, treatments will not exceed 1,000 acres per year.

(3) Previously-treated plants will be treated a second time at a given site if the first treatment was not effective in killing the majority of the plants. In this case, the second treatment will not be conducted until the specified time period has passed, per label requirements or the fish passage protocol, whichever is more protective of listed fish species.

(4) The actual number of locations that will be treated more than once depends on factors such as herbicide efficacy, growth of the plants, and tidal movement that cannot be easily predicted. USDA and CDBW will seek to minimize the number of times that a given spongeplant mat will be treated per season, and will follow herbicide labels regarding total number of applications allowed.

Treatments occur Monday through Thursday when weather, wind-speed, and other environmental conditions are favorable for treatment to be maximized. On any given treatment day, treatment acres per day are limited by: (1) the number of crews available; (2) travel time to reach the site; (3) time required to set-up, conduct monitoring, and treat a site; (4) the amount of spongeplant growing at a particular site; (5) the herbicide label restrictions; (6) fish passage protocols; and (7) weather and tide conditions. The crew can treat, on average, between 5 and 16 acres per day, based on historical data from the WHCP and EDCP in 2007 through 2011 (USDA 2012 and 2013).

**Physical Control Methods**

In addition to herbicide treatments, USDA and CDBW propose to utilize physical methods such as hand removal with nets, herding, and mechanical removal methods. Hand removal methods will occur throughout the year and primarily be utilized to reduce plant biomass where chemical treatments are less effective or cannot be utilized, in areas subject to high infestation, and within emergent vegetation. Hand removal of spongeplant includes the use of pool-skimmer nets to ensure that the plant is completely removed. Treatment crews will hold a heavy-duty skimmer, 3/8 inch solid aluminum rod, with deep net molded in the water column and skim the water's surface to remove the plant.

Herding refers to the pushing or pulling of mats from one location to another. Spongeplant mats will be moved to specified removal locations or to the main channel. Field crews will use a rectangular frame (8 feet long and 3 feet high) with wire mesh, attached to boat. A rope is attached to the bottom of the frame to easily operate the herding device. Once the operator has herded the spongeplant into the main channel, the spongeplant will flow out of the Delta into the saline waters and decompose. CDBW field crews will not herd in areas where physical damage to emergent vegetation and native vegetation is likely to occur. This method will not be used as frequent as the hand removal method. Crews have conducted herding of water hyacinth in Old River near the federal Tracy Fish Collection Facility (TFCF), and will likely do the same for spongeplant, should levels of infestation reach 3 to 5 acres. There are negative flows to the pumps at that location that do not allow movement of plants to the main channel flowing out of the Delta. However, herding conducted in this area is in partnership with U.S. Bureau of Reclamation and TFCF mechanical removal/conveyor system. As for herding to move spongeplant out of the Delta, the CDBW does not anticipate this method will take place in other areas of Old and Middle rivers due to unfavorable net negative flows.

CDBW will use herding in conjunction with mechanical removal methods, which are based on the extent of infestation. CDBW estimates that a substantial infestation (*i.e.,* minimum, 3 to 5 acres) is need to trigger mechanical removal. Large spongeplant mats can be dispersed throughout a water way (*i.e.*, along tule islands, next to levees, *etc.*). CDBW will likely conduct mechanical removal when large spongeplant mats impede navigation, and/or when immediate removal of weeds is required. CDBW will use an excavator and dump trunk on concrete ramp to lift spongeplant from the waterways surrounding the ramp. CDBW field crews will support excavation by herding spongeplant. This mechanical approach will be used only in limited locations when spongeplant growth is concentrated near boat ramps. CDBW will also utilize cutters and conveyors to remove spongeplant. This equipment will collect and unload vegetation using a conveyor system on a boom, adjusted to the appropriate cutting height. The cutters will collect material and unload the plant material on the vessel using the conveyor. The cut plant material will be offloaded to a dump truck parked at a nearby boat ramp to offload spongeplant. Spongeplant will be disposed at authorized locations, typically nearby farm fields. Although mechanical equipment such as excavators/cutters and conveyors have been used in the WHCP, it is unlikely that mechanical methods will be used in the 2014 SCP due to low levels of spongeplant in the proposed action area.

**Timing of Control Activities**

USDA and CDBW proposed a calendar-based schedule for SCP activities from 2014 to 2017 (Table 3). The actual start date will depend on a combination of calendar-dates, field surveys of spongeplant to evaluate plant growth, and juvenile fish monitoring to determine presence of listed fish species. The objective of this approach is to improve SCP chemical treatment efficacy without negatively impacting listed fish species. Seasonal temperature fluctuations in the Delta impact both spongeplant growth and migratory fish activity. These weather fluctuations can become relatively extreme and may make calendar-based start dates less relevant.

USDA and CDBW will apply 2,4-D according to the following application windows established in NMFS (2011, appendix 9) to minimize the potential negative effects to steelhead: (1) June 15$^{th}$ and September 15$^{th}$ in the Delta, and (2) July 15$^{th}$ and August 15$^{th}$ in the Southern treatment sites. Glyphosate, penoxsulam, or imazamox will be used from March 1$^{st}$ through November

30th. Diquat will only be used from August 1st through November 30th and will be limited to 50 treatment acres in the Delta; a sum of the combined acres treated with diquat from both the SCP and EDCP. While hand removal may be conducted year-round, herding or mechanical removal will not be conducted in the months of May and June.

Table 3. Proposed calendar-based control activities and application window (shaded) for the SCP for 2014-2017. The dark shading indicates the 2,4-D treatment period window in the southern sites between July 15th and August 15th.

| Control Method | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | | | | | | | | | | | | |
| Glyphosate | | | | | | | | | | | | |
| Penoxsulam | | | | | | | | | | | | |
| Imazamox | | | | | | | | | | | | |
| Diquat | | | | | | | | | | | | |
| Hand removal with nets | | | | | | | | | | | | |
| Herding | | | | | | | | | | | | |
| Mechanical removal | | | | | | | | | | | | |

Neither chemical treatment nor physical removal will be performed at or near sites where listed anadromous fish species are likely to be present. USDA and CDBW will consult several state and Federal juvenile fish monitoring programs to evaluate presence of listed fish species. These monitoring programs provide daily or weekly data for the number of juvenile fish migrating to or exiting the Delta. CDBW environmental scientists will compare results from fish monitoring with scheduled treatment sites to determine likely presence of listed fish species. If monitoring data indicate that threatened or endangered fish are likely to be present in the treatment site, CDBW will delay treatment.

On any given treatment day, actual start of treatments depends on the distance from CDBW's boat dock to the treatment site. Field crews begin their work day at 6:30 a.m., thus treatment activities generally occur in mid-morning, and again in early afternoon.

Physical and mechanical control methods, such as hand removal, herding, and mechanical removal, will typically occur early in the treatment season, but could be employed at any time during the treatment season to address new infestations or infestations in high-use areas, with the exception of herding and mechanical removal in May and June.

**Description of the Action Area**

The project area for the SCP is specified as "the Delta, its tributaries, and the marsh" (Harbors and Navigation Code Section 64). The State of California legal definition of the Delta includes six counties (San Joaquin, Yolo, Sacramento, Solano, Contra Costa, and Alameda). The general boundaries for the action area are as follows:

- West up to and including Sherman Island at the confluence of the Sacramento and San Joaquin Rivers;
- West up to the Sacramento Northern Railroad to include water bodies north of the southern confluence of the Sacramento River and Sacramento River Deep Water Ship Channel;

- North to the northern confluence of the Sacramento River and Sacramento River Deep Water Ship Channel, plus waters within Lake Natoma;
- South along the San Joaquin River to Mendota, just east of Fresno;
- East along the San Joaquin River from Mendota to Friant Dam on Millerton Lake;
- East along the Tuolumne River to LaGrange Reservoir below Don Pedro Reservoir; and
- East along the Merced River to Merced Falls, below Lake McClure.

Although the action area for the SCP includes the Delta, San Joaquin River, Tuolumne River, and Merced River, spongeplant is currently found in small areas of the Delta (USDA 2014).

**Interrelated and Interdependent Actions**

An interrelated action is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent action is an activity that has no independent utility apart from the action under consultation. There are no interrelated or interdependent actions in the proposed action.

## ACTION AGENCY'S EFFECTS DETERMINATION

NMFS has received all of the information necessary to initiate consultation on federally listed anadromous fish species and their designated critical habitats within the action area. Based on our review of the material provided, and the best scientific and commercial data currently available, NMFS concurs with USDA's determination that the proposed spongeplant control program from 2014 through 2017 is not likely to adversely affect (NLAA) federally listed endangered Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), threatened Central Valley (CV) spring-run Chinook salmon (*O. tshawytscha*), threatened California CV steelhead (*O. mykiss*), or threatened Southern distinct population segment (sDPS) of North American green sturgeon (*Acipenser medirostris*), or any of their respective designated critical habitats (Table 4).

Table 4. Listed species status and relevant habitat designation

| Listed Species | Scientific Name | Status | FR Notices |
|---|---|---|---|
| CV Spring-run Chinook salmon | *Oncorhynchus tshawytscha* | Threatened | †76 FR 157, August 15, 2011<br>‡70 FR 52488, September 2, 2005 |
| Sacramento River winter-run Chinook salmon | *O. tshawytscha* | Endangered | †70 FR 37160, June 28, 2005<br>‡58 FR 33212, June 16, 1993 |
| California CV steelhead | *O. mykiss* | Threatened | †76 FR 157, August 15, 2011<br>‡70 FR 52488, September 2, 2005 |
| North American green sturgeon | *Acipenser medirostris* | Threatened | †71 FR 17757, April 7, 2006<br>‡74 FR 52300, October 9, 2009 |

†species listing
‡critical habitat designation

The action area contains waterways where Sacramento River winter-run Chinook salmon, CV spring-run Chinook salmon, California CV steelhead, and/or the sDPS of North American green sturgeon may be present. The three listed salmonids have the greatest potential to occur in the action area primarily between November and June, based on the timing of adult and juvenile

migrations in and through the waterways of the Delta. Juvenile steelhead may occur in the San Joaquin River and its tributaries from October through June. Green sturgeon presence is presumed to be year-round within the Delta.

The action area includes waters that have been designated as critical habitat for CV spring-run Chinook salmon, California CV steelhead, and the sDPS of North American green sturgeon. The essential features of critical habitat in the action area for listed species include areas of emigration, rearing, and/or smoltification of juveniles and immigration of adult salmon and steelhead. The essential features of critical habitat in the action area for green sturgeon include two categories: (1) freshwater riverine systems (food resources, substrate type and size, water flow, migratory corridor, water quality and depth); and (2) estuarine areas (food resources, water flow, water quality, migratory corridor, water depth, and sediment quality). The essential features attributes of prey availability, primary productivity, shelter availability, and water quality are the primary assessment endpoints addressed when evaluating the effects of the proposed actions on the designated critical habitat. Information evaluated for effects to prey, primary production, or shelter includes survival, growth, reproduction, or abundance of prey, (*e.g.,* macroinvertebrates), phytoplankton, and macrophytes.

USDA and CDBW evaluated the individual fitness of exposed salmonids/green sturgeon and developed risk hypothesis for each species. Specifically, USDA and CDBW determined that the proposed use of glyphosate, 2,4-D, penoxsulam, imazamox, and diquat is not likely to:

a) kill salmonids/green sturgeon from direct exposure,
b) reduce reproduction of salmonids and green sturgeon ,
c) reduce growth of salmonids and green sturgeon through impacts on the availability and quantity of prey, or
d) accumulate in salmonids and green sturgeon, which would impair fitness.

USDA and CDBW also evaluated the effects from the stressors of the action and contributing environmental factors and developed risk hypothesis for critical habitat. Specifically, USDA and CDBW determined that the proposed use of glyphosate, 2,4-D, penoxsulam, imazamox, and diquat is not likely to cause adverse effects to critical habitat from:

a) exposure to each of these five herbicides,
b) exposure to the degradates of these five herbicides,
c) exposure to adjuvants (Agridex and Competitor), tank mixtures, and other chemicals within a pesticide,
d) exposure to other pesticides present in the action area that act in combination with the five herbicides to increase effects, and
e) exposure to elevated temperatures, which may enhance the toxicity of the stressors of the action.

USDA and CDBW will treat approximately 1.5 percent of the Delta waters in each of the four application seasons from 2014 through 2017. The SCP activities are expected to improve key ecosystems services (*e.g.,* enhancing the already degraded critical habitat and water quality, and prey availability for salmonids and green sturgeon by controlling spongeplant).

## CONSULTATION HISTORY

On February 2, 2014, NMFS received from USDA a written request for initiation of informal section 7 consultation under the ESA for the SCP covering application seasons 2014-2017. NMFS also received the SCP biological assessment (BA) and supplemental material.

On April 21, 2014, NMFS requested to CDBW by email a start date for the SCP program.

On April 21, 2014, CDBW responded and provided NMFS with a June 1st start date for the SCP in 2014.

On April 29, 2014, NMFS discussed with CDBW, by telephone, the BA and supplemental material. Specifically, NMFS and CDBW discussed additional information of herbicide and adjuvant label information, specifications on herding equipment use for removal of spongeplant, clarification on total number of acres treated by chemical methods in the SCP, and explanation of diquat concentrations and NPDES permit requirements.

On April 30, 2014, NMFS met with CDBW to discuss additional information and clarification of the items discussed in the April 29, 2014, telephone call with CDBW. On April 30, 2014, NMFS requested by email that USDA and CDBW provide NMFS with additional information and clarification on: (1) label and MSDS for Aquamaster and Rodeo; (2) bioconcentration factor (BCF) for active ingredients glyphosate and 2,4-D, and adjuvants Agridex and Competitor; (3) aquatic DT50 (days); (4) $K_{oc}$; (5) dimension of the equipment used for herding; and (6) the number of acres estimated to be treated by chemical treatment methods per year and the entire program. NMFS also requested an explanation of what constitutes a "substantial" infestation to trigger mechanical removal methods in the SCP, and clarification on diquat NPDES permit requirements in surface water and application rates for diquat in the SCP.

On May 1, 2014, NMFS received all the requested information from CDBW per the email request on April 30, 2014.

## ENDANGERED SPECIES ACT

### Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur.

NMFS has received all the information necessary to initiate consultation on federally listed anadromous fish species and their designated critical habitats within the action area. The potential effects of the proposed action are discussed below.

**Chemical Controls**

NMFS conducted effects analyses and risk assessment using the data and information provided by USDA and CDBW (CDBW 2014), as well as other data from the U.S. Environmental Protection Agency's (USEPA's) ECOTOX database (USEPA 2014), journal articles, and technical reports (Hamelink *et al.* 1986, Habig 2004, Laetz *et al.* 2009, MacNeale *et al.* 2010, Michel *et al.* 2004, Nielson and Dahllof 2007, Reylea 2009, Schlenk *et al.* 2012, Scholz *et al.* 2012, NMFS 2013b). USDA's determination of NLAA is based on the results of the risk assessment framework that follows an interim approach recommended by the National Research Council (NRC) in the form of a report entitled, "Assessing Risk to Endangered and Threatened Species from Pesticides" (NRC 2013), and the most up to date scientific information on pesticides risk assessment framework (NMFS 2011 and NMFS 2013b).

The risk assessment framework organizes the available information into three parts: problem formation, analysis of exposure and response, and risk characterization (USEPA 2004). The USEPA, U.S. Fish and Wildlife Service (USFWS), NMFS, and USDA have worked together to develop and implement a shared approach of an interim risk assessment framework, which focuses on a species centric weight-of-evidence approach rather than a chemical-centric approach (NRC 2013). Studies with listed species are preferable, however when there is not a complete suite of information relating to effects on listed species, data from other surrogate species are used, recognizing and noting where there may be substantial interspecies extrapolation. For example, rainbow trout are used as surrogates for salmonids and white sturgeon for green sturgeon. Even through there may be interspecies extrapolation, data from surrogates are considered the best available and were used in previous national pesticide consultations.

Exposure of the listed species to glyphosate, 2,4-D, imazamox, penoxsulam, and diquat, when applied as proposed, poses a low risk to fish mortality and reduction in fish growth and reproduction. Although there is evidence of chronic/sublethal toxicity effects of 2,4-D and glyphosate and slight toxicity effect of diquat on the listed species, the potential effects are deemed insignificant because they would not reach a scale in which take occurs (*e.g.,* the size of the treatment area is a maximum 1,000 acres, or 1.5 percent, of the total waterway area in the Delta per year, and not contiguous). The effects are also discountable or extremely unlikely to occur considering the dissipation half-life and observed concentrations of the herbicides, and juvenile migration (*e.g.*, Chinook salmon or steelhead) speed in the Delta. Based on the evidence provided (*i.e.*, 96-hour LC50 toxicity test), salmonids do not hold for more than four days at a time to be affected by the proposed chemical treatment methods (USDA 2014).

Exposure of listed species to adjuvants Agridex and Competitor, as proposed, poses a low risk of fish mortality and reduction in fish growth and reproduction since their EECs are several orders of magnitude lower than their respective toxicity endpoints effect concentrations (EC50 for rainbow trout.

The proposed use of herbicides poses a low risk to the critical habitats designated for winter-run Chinook salmon, spring-run Chinook salmon, steelhead, and green sturgeon. The chronic toxicity data for macroinvertebrates (prey species) indicated that EECs are 2 to 3 orders of magnitude lower than their respective toxicity endpoints (*e.g.,* EC50). The use of penoxsulam, imazamox, and diquat may negatively affect aquatic vascular plants; however the potential effect

is insignificant or discountable, considering the relatively short dissipation half-life of the herbicides, recoverability of the affected aquatic plants, and the size of the treatment areas.

**Water Quality**

Decomposition of spongeplant and other aquatic plants following application of herbicide products may reduce DO concentrations, and low DO can result in fish mortality. However, according to USDA and CDBW, application of Weedar 64 and Roundup Custom is not likely to reduce DO to a level unsafe for listed fish species. Of 719 treatments occurring from 2007 to 2011, there were 13 cases with no change in DO, 404 cases with an increase in DO (average increase of 0.8 mg/L), and 302 cases with an average decrease of 0.6 mg/L in DO. The average pre-treatment DO was 7.9 mg/L, and the average post-treatment DO was 8.1 mg/L. Since imazamox and penoxsulam are slow-acting systemic herbicides, they are not expected to result in reduced DO levels.

Following the herbicide label requirements for Roundup Custom (glyphosate), Weeder 64 (2,4-D), and Reward (diquat) or the fish passage protocol regarding the number of treatments and time between treatments for each treatment site and herbicide application will minimize the potential for low DO as a result of herbicide applications. To further minimize the effect of potential decreases in DO on listed species, USDA and CDBW will monitor DO pre-and post-treatment for all spongeplant treatments. Treatment will occur if DO levels are below 3 mg/L. When DO levels are below 3mg/L, USDA and CDBW assume that no fish are present and further degradation of water quality will not occur in the proposed action area. No treatments will be performed if pre-treatment DO levels are between 3 mg/L and the Basin Plan upper limit established by the Central Valley Regional Water Quality Control Board for a given location and time of year (*e.g.,* depending on the location and time of year upper limits can range from 5 mg/L-8 mg/L (USDA 2014).

**Physical Removal**

The negative effects of hand removal with nets, herding, and mechanical removal on listed fish species are extremely unlikely to occur due to the nature and limited scope of the activities. Mechanical removal may negatively affect the listed species when they co-occur with the removal activities. However, the potential effects would be discountable based on the following information and mitigation measures:

(1) Mechanical removal methods will be used in limited locations when spongeplant growth is concentrated near a boat ramp or where chemical treatment must be avoided, such as sites with elderberry shrubs along the shoreline; and

(2) If field surveys, as described in USDA's proposed action, indicate that listed fish species are present or likely to be present, physical and mechanical removal of spongeplant mats will not be conducted until such time as listed species are not likely to be present.

In summary, adverse effects to salmonids and green sturgeon are insignificant because of the unlikely potential for them to be exposed to the glyphosate, 2,4-D, penoxsulam, imazamox, or diquat. Effects to critical habitat from short-term exposure are not expected to appreciably reduce the conservation values of the designated critical habitat. On the other hand, there would be beneficial effects of the proposed action to listed species and their critical habitat. The SCP

would improve the habitat condition and water quality in the action area by increasing the establishment of native vegetation, improving shallow-water habitat for native species, increasing DO levels, minimizing the potential for invasive weed species colonization, and increasing water velocity in the action area.

**Conclusion**

Based on this analysis, NMFS concurs with USDA that the proposed Spongeplant Control Program is not likely to adversely affect federally listed Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, California Central Valley steelhead, the Southern DPS of North American green sturgeon, or any of their designated critical habitats.

**Reinitiation of Consultation**

Reinitiation of consultation is required and shall be requested by USDA or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter; or if (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA portion of this consultation.

## FISH AND WILDLIFE COORDINATION ACT

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development (16 U.S.C. 661). The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, include navigation and drainage (16 U.S.C. 662(a)). Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the ESA and MSA. However, because the proposed project is designed to avoid environmental impacts to aquatic habitat within the action area, NMFS has no additional FWCA comments to provide. This concludes the FWCA portion of this consultation.

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. USDA also has the same responsibilities, and informal consultation offers action agencies an opportunity to address their conservation responsibilities under section 7(a)(1).

Please direct questions regarding this letter to Dr. Melanie Harrison, California Central Valley Area Office, at 916-930-3728 or Melanie.Harrison@noaa.gov.

Sincerely,

for William W. Stelle, Jr.
Regional Administrator

cc: Division- File copy ARN 151422WCR2014SA00035
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**Literature Cited**

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## Appendix B

# SCP Herbicide Labels and Material Safety Data Sheets

# Appendix B
# Herbicide and Adjuvant Labels and Material Safety Data Sheets

This appendix contains the most recent herbicide labels, supplemental labels (as applicable) and Material Safety Data Sheets (MSDS) for the SCP, in the following order:

1. 2,4-D (Weedar) Label and MSDS
2. Glyphosate (Roundup Custom) Label and MSDS
3. Penoxsulam (Galleon SC) Label, Supplemental Label and MSDS
4. Imazamox (Clearcast) Label, Supplemental Label and MSDS
5. Diquat (Reward) Label, Pending CA Label and MSDS
6. Agri-dex Label and MSDS
7. Competitor Label and MSDS.

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# 2,4-D (Weedar) Label and MSDS

Nufarm

# Weedar® 64

## Broadleaf Herbicide

### THE 2,4-D AMINE WEED KILLER

**To Control Susceptible Broadleaf Weeds In Cereal Grains, Corn, Sorghum, Rice, Sugarcane, Soybeans (Preplant only), Turf, Non-Crop Areas, And Certain Aquatic Applications**

**ACTIVE INGREDIENT:**

| | |
|---|---|
| 2,4-Dichlorophenoxyacetic acid, dimethylamine salt* | 46.8% |
| **OTHER INGREDIENTS:** | 53.2% |
| **TOTAL:** | 100.0% |

*2,4-Dichlorophenoxyacetic acid equivalent 38.9% by weight or 3.8 pounds per gallon.
Isomer specific by AOAC method No. 978.05

**KEEP OUT OF REACH OF CHILDREN**

**DANGER / PELIGRO**

PRECAUCION AL USUARIO: Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

**SEE INSIDE BOOKLET FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS**

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800) 424-9300. For Medical Emergencies Only, Call (877) 325-1840.

EPA REG. NO.71368-1

Manufactured for
Nufarm Inc.
150 Harvester Drive
Burr Ridge, IL 60527

Nufarm

SPECIMEN

## PRECAUTIONARY STATEMENTS
## HAZARDS TO HUMANS AND DOMESTIC ANIMALS
## DANGER / PELIGRO

Corrosive. Causes irreversible eye damage. Harmful if swallowed. Avoid breathing vapors or spray mist. Do not get in eyes, on skin or on clothing.

**PERSONAL PROTECTIVE EQUIPMENT (PPE):**

Some of the materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical-resistance category selection chart.

**All mixers, loaders, applicators, and other handlers must wear:**
- long-sleeved shirt and long pants,
- shoes and socks, plus
- chemical-resistant gloves (except for applicators using ground boom equipment),
- chemical-resistant apron when mixing or loading, cleaning up spills or equipment, or otherwise exposed to the concentrate, and
- protective eyewear (goggles or face shield).

See engineering controls for additional requirements.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

**ENGINEERING CONTROLS STATEMENTS:**
When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d) (4-6)], the handler PPE (personal protective equipment) may be reduced or modified as specified in the WPS. Pilots must use an enclosed cockpit that meets the requirements listed in the WPS for agricultural pesticides [40 CFR 1 70.240(d)(6)].

## USER SAFETY RECOMMENDATIONS

**Users Should:**
- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

## FIRST AID

| | |
|---|---|
| **IF IN EYES** | •Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.<br>•Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.<br>•Call a poison control center or doctor for treatment advice. |
| **IF SWALLOWED** | •Call a poison control center or doctor immediately for treatment advice.<br>•Have person sip a glass of water if able to swallow.<br>•Do not induce vomiting unless told to do so by the poison control center or doctor.<br>•Do not give anything by mouth to an unconscious person. |
| **IF ON SKIN OR CLOTHING** | •Take off contaminated clothing.<br>•Rinse skin immediately with plenty of water for 15 to 20 minutes.<br>•Call a poison control center or doctor for treatment advice. |

## HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-325-1840 for emergency medical treatment information.

## NOTE TO PHYSICIANS

This product contains a phenoxy herbicidal chemical. There is no specific antidote. All treatments should be based on observed signs and symptoms of distress in the patient. Probable mucosal damage may contraindicate the use of gastric lavage. Overexposure to materials other than this product may have occurred.

SPECIMEN

## ENVIRONMENTAL HAZARDS

This product is toxic to fish and aquatic invertebrates. For Terrestrial Uses: Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark except as noted on appropriate labels. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment washwater or rinsate.

This product contains a chemical with properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

For Aquatic Uses: Fish breathe dissolved oxygen in the water and decaying weeds also use oxygen. When treating continuous, dense weed masses, it may be appropriate to treat only part of the infestation at a time. For example, apply the product in lanes separated by untreated strips that can be treated after vegetation in treated lanes has disintegrated. During the growing season, weeds decompose in a 2 to 3 week period following treatment. Begin treatment along the shore and proceed outwards in bands to allow fish to move into untreated areas. Waters having limited and less dense weed infestations may not require partial treatments.

Do not contaminate water used for irrigation or domestic purposes (except as specifically listed on this label) especially in areas where grapes, cotton, tomatoes or other susceptible plants are grown.

Do not treat irrigation ditches in areas where water will be used to overhead (sprinkler) irrigate susceptible crops especially grapes, tomatoes, tobacco, and cotton.

Do not apply this product directly to, or permit to drift onto cotton, okra, grapes, tomatoes, fruit trees, vegetables, flowers or other desirable crop or ornamental plants which are susceptible to 2,4-D herbicide. Do not apply near susceptible plants since very small quantities of the 2,4-D will cause severe injury during the growing or dormant periods. Crops contacted by this product sprays or spray drift may be killed or suffer significant stand loss with extensive quality and yield reduction.

**MIXING AND LOADING:** Most cases of ground water contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of ground water supplies. Use of closed systems for mixing or transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent ground water contamination.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read entire label before using this product.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is: coveralls, chemical-resistant gloves made of any water-proof material, shoes plus socks, protective eyewear.

## NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow people (or pets) to enter the treated area until sprays have dried.

## USE PRECAUTIONS AND RESTRICTIONS

Do not apply this product through any type of irrigation system. Do not use in or near a greenhouse. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

## PRODUCT INFORMATION

INJURY TO CROPS FROM THIS HERBICIDE MAY OCCUR. IF YOU ARE NOT PREPARED TO ACCEPT SOME DEGREE OF CROP INJURY DO NOT USE THIS PRODUCT.

Crop varieties vary in response to 2,4-D and some are easily injured. Apply this product only to varieties known to be tolerant to 2,4-D. If you are uncertain concerning tolerant varieties or local use situations that may affect crop tolerance to 2,4-D, consult your seed company, State Agricultural Extension Service or qualified crop consultant for advice.

Be sure that use of this product conforms to all applicable laws, rules and regulations. Certain states have restrictions pertaining to application distances from susceptible crops. The applicator should become familiar with these laws, rules or regulations and follow them exactly.

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## MIXING INSTRUCTIONS

Add about one-half the water to the mixing tank, then add this product with agitation and finally the rest of water with continuing agitation.

**NOTE:** Adding oil, wetting agent, or other surfactants to the spray may increase effectiveness on weeds but also may reduce selectivity to crops, resulting in crop damage.

## COMPATIBILITY

If this product is to be tank mixed with fertilizers or with other pesticides, compatibility should be tested prior to mixing. To test for compatibility, use a small container and mix a small amount (0.5 to 1 quart) of spray, combining all ingredients in the same ratio as the anticipated use. If any indications of physical incompatibility develop, do not use this mixture for spraying. Indications of incompatibility usually will appear within 5 to 15 minutes after mixing.

Read and follow all directions and precautions on this label and on the labels of any products for which a tank mixture is being considered.

## APPLICATION PROCEDURES

Apply by air or ground equipment in sufficient gallonage to obtain adequate coverage, except as otherwise directed on this label. Use 2 or more gallons of water per acre for aerial application and 10 or more gallons of water per acre for ground application.

## SPRAY DRIFT MANAGEMENT

A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, relative humidity) and method of application (e.g., ground, aerial, airblast) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product.

**Droplet Size**

When applying sprays that contain 2,4-D as the sole active ingredient, or when applying sprays that contain 2,4-D mixed with active ingredients that require a Coarse or coarser spray, apply only as a Coarse or coarser spray (ASAE standard 572) or a volume mean diameter of 385 microns or greater for spinning atomizer nozzles.

When applying sprays that contain 2,4-D mixed with other active ingredients that require a Medium or more fine spray, apply only as a Medium or coarser spray (ASAE standard 572) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles.

**Wind Speed**

Do not apply at wind speeds greater than 15 mph. Only apply this product if the wind direction favors on-target deposition and there are not sensitive areas (including, but not limited to, residential areas, bodies of water, known habitat for nontarget species, nontarget crops) within 250 feet downwind. If applying a Medium spray, leave one swath unsprayed at the downwind edge of the treated field.

**Temperature Inversions**

If applying at wind speeds less than 3 mph, the applicator must determine if: a) conditions of temperature inversion exist, or b) stable atmospheric conditions exist at or below nozzle height. Do not make applications into areas of temperature inversions or stable atmospheric conditions.

**Susceptible Plants**

Do not apply under circumstances where spray drift may occur to food, forage, or other plantings that might be damaged or crops thereof rendered unfit for sale, use or consumption. Susceptible crops include, but are not limited to, cotton, okra, flowers, grapes (in growing stage), fruit trees (foliage), soybeans (vegetative stage), ornamentals, sunflowers, tomatoes, beans, and other vegetables, or tobacco. Small amounts of spray drift that might not be visible may injure susceptible broadleaf plants.

**Other State and Local Requirements**

Applicators must follow all state and local pesticide drift requirements regarding application of 2,4-D herbicides. Where states have more stringent regulations, they must be observed.

**Equipment**

All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers or surrogates.

*Additional requirements for aerial applications:*

The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter.

Release spray at the lowest height consistent with efficacy and flight safety. Do not release spray at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety. This requirement does not apply to forestry or rights-of-way applications.

When applications are made with a crosswind, the swath will be displaced downwind. The applicator must compensate for this by adjusting the path of the aircraft upwind.

*Additional requirements for ground boom application:*

Do not apply with a nozzle height greater than 4 feet above the crop canopy.

## SMALL QUANTITY DILUTION TABLE

To spray small areas use the following dilution table.

| If Dosage on Label Shows Following Rate Per Acre | Use this Amount for each Gallon of Water Per 1,000 Square Feet |
|---|---|
| 2 pints (1 quart) | 0.72 ounces (4.3 teaspoons) |
| 3 pints (1-1/2 quarts) | 1.1 ounces (2 tablespoons) |
| 4 pints (2 quarts) | 1.4 ounces (2.8 tablespoons) |
| 6 pints (3 quarts) | 2.2 ounces (4.4 tablespoons) |

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## GENERAL WEED LIST

**Annual and Biennial Weeds**

Beggarticks*
Bullthistle
Coffeeweed
Common cocklebur
Common burdock
Common evening primrose
Common lambsquarters
Hairy galinsoga
Jimsonweed
Knotweed*
Mallow* (venice or little)
Marshelder
Morningglory (common, ivy, woolly)
Musk thistle* (***)
Mustards (except blue mustard)
Pepper weeds (except perennial)
Pigweeds** (Amaranthus spp.)
Prickly lettuce
Ragweed (common or giant)
Rough fleabane
Russian thistle*
Salsify (western or common)
Smartweeds* (annual species)
Sowthistle (annual or spiny)
Sunflower
Vervains*
Vetches
Wild carrot
Wild lettuce
Wild parsnips

## GENERAL WEED LIST

**Perennial Weeds**

Bindweed* (hedge, field, European) Blue lettuce
Canada thistle*
Catnip
Chicory
Dandelion
Docks*
Dogbane*
Goldenrod*
Healall
Ground ivy*
Hoary cress*
Ironweed*
Jerusalem artichoke
Many flowered aster
Nettles* (including stinging)
Orange hawkweed*
Plantains
Sowthistle (perennial)
Vervains*
Wild garlic*
Wild onion*

*These species may require repeated applications and/or use of the higher rate recommended on this product label even under ideal conditions for application.
**Control of pigweeds in the High Plains area of Texas and Oklahoma may not be satisfactory with this product.
***Not registered for control of musk thistle in California.

## SPECIFIC USE DIRECTIONS
## APPLES, PEARS, STONE FRUIT AND NUT ORCHARDS

| WEEDS IN CROPS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual broadleaf weeds** | 3 pints | For control of weeds on the orchard floor, apply using coarse sprays and low pressure in sufficient volume of water to obtain thorough wetting of weeds. Treat when weeds are small and actively growing. For filberts, apply a maximum of 2.1 pints (1.0 lb. ae) per 100 gallons of spray solution per application. Do not use on light sandy soil. **DO NOT USE IN CALIFORNIA.** |

**RESTRICTIONS AND LIMITATIONS FOR USE IN APPLES, PEARS, STONE FRUIT AND NUT ORCHARDS**

- Do not apply to bare ground as injury may result.
- Do not apply immediately before irrigation and withhold irrigation for 2 days before and for 3 days after treatment.
- Do not allow spray to drift onto or contact foliage, fruit, stems, trunks of trees or exposed roots as injury may result.
- Do not apply to newly established or young orchards. Trees must be at least 1 year old and in vigorous condition.
- Do not apply during bloom.
- Do not graze or feed cover crops from treated orchards.
- Do not make more than 2 applications per crop cycle. Maximum of 4.2 pints (2.0 lbs. ae) per acre per application.
- Do not harvest apples and pears within 14 days of application, stone fruit within 40 days of application and nuts within 60 days of application.
- For apples, pears and stone fruits, allow at least 75 days between applications.
- For tree nuts, allow at least 30 days between applications.
- Do not cut orchard floor forage for hay within 7 days of application.

SPECIMEN

## CEREAL GRAINS
## Barley, Oats, Rye, Triticale, Wheat

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Not underseeded with legumes**<br>**Postemergence**<br>Annual and biennial broadleaf weeds<br>Perennial broadleaf weeds | <br><br>1/2 to 2 pints*<br>1 to 2 pints* | Apply after grain is well tillered (usually about 4 to 8 inches high). **Do not spray grain in the boot to dough stage.** |
| **Underseeded with legumes** | 1/4 to 1/2 pint* | Apply after grain is 8 inches tall. **Do not spray grain in boot to dough stage.** Do not spray alfalfa or sweet clover unless the infestation is severe and injury to these legumes can be tolerated. |
| **Emergency weed control in Triticale, Wheat**<br>Perennial broadleaf weeds | 2.6 pints | Apply when weeds are approaching bud stage, after the grain dough stage. **Do not spray during the boot to dough stage.** The 2.6 pints per acre application can produce injury to wheat. Balance the severity of your weed problem against the possibility of crop damage. Where perennial weeds are scattered, spot treatment is suggested to minimize the extent of crop injury. |

*Use the lower rate if small annual and biennial weeds are the major problem. Use the higher rate if perennial weeds or annual and biennial weeds are present which are in the hard-to-kill categories as determined by local experience. The higher rates increase the risk of grain injury and should be used only where the weed control problem justifies the grain damage risk. Do not apply this product to grain in the seedling stage.

**RESTRICTIONS AND LIMITATIONS FOR USE ON CEREAL GRAINS**

- For aerial application on grain, apply this product in 3 to 10 gallons of water per acre.
- For ground application a minimum of 10 to 15 gallons of water per acre is recommended for proper spray coverage.
- Do not permit dairy animals or meat animals being finished for slaughter to forage treated grain fields within 2 weeks after treatment.
- Do not feed treated straw to livestock if an emergency treatment as described above is applied.
- Do not harvest within 14 days of application.
- Limit to one postemergence application per crop cycle.
- Limit to one preharvest application per crop cycle.
- **Postemergence:** Maximum of 2.6 pints (1.25 lbs. ae) per acre per application.
- **Preharvest:** Maximum of 1 pint (0.5 lb. ae) per acre per application.
- Limit to 3.6 pints product (1.75 lbs. ae) per acre per crop cycle.

## CORN AND SORGHUM

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **CORN (Field and Sweet)**<br>**Preplant** | 1 to 2 pints | To control emerged broadleaf weed seedlings or existing cover crops prior to planting corn, apply 7 to 14 days before planting. Do not use on light, sandy soil, or where soil moisture is inadequate for normal weed growth. Use high rate for less susceptible weeds or cover crops such as alfalfa. |
| **Preemergence** | 2 pints | Apply 3 to 5 days after planting but before corn emerges. Do not use on light, sandy soils or where soil moisture is low. |
| **Postemergence**<br>Annual broadleaf weeds<br>Perennial broadleaf weeds | 1/2 to 1 pint<br>1 pint | Apply when weeds are small and corn is less than 8 inches tall (to top of canopy). When corn is over 8 inches tall, use drop nozzles and keep spray off foliage. Treat perennial weeds when they are in the bud to bloom stage. **Do not spray corn in the tassel to dough stage.** Corn treated with 2,4-D may become temporarily brittle. Winds or cultivation may cause stalk breakage during the period of time when the corn is brittle. |
| **Grain Sorghum (Milo)**<br>Postemergence | 1 pint | Apply when sorghum is 6 to 15 inches tall. If sorghum is taller than 8 inches to top of the canopy, use drop nozzles and keep spray off the foliage. **Do not treat during the boot, flowering or dough stage.** |

**CORN (FIELD AND SWEET) AND SORGHUM RESTRICTIONS**

- Do not forage or feed fodder for 7 days following application.
- Do not permit meat or dairy animals to consume treated crop as fodder or forage for 30 days following application.

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**Field Corn and Popcorn Restrictions**

- **(PHI)** Do not harvest within 7 days of application.
- Limited to one Preplant, one Postemergence and one Preharvest application per crop cycle.
  - **Preplant or Preemergence:** Maximum of 2 pints (1.0 lb. ae) per acre.
  - **Postemergence:** Maximum of 1 pint (0.5 lb. ae) per acre.
  - **Preharvest:** Maximum of 3 pints (1.5 lbs. ae) per acre.
  - Maximum of 6 pints (3.0 lbs. ae) per acre per crop cycle.

**Sweet Corn Restrictions**

- **(PHI)** Do not harvest within 45 days of application.
- Limited to one Preplant and one Postemergence application per crop cycle.
  - **Preplant or Preemergence:** Maximum of 2 pints (1.0 lb. ae) per acre.
  - **Postemergence:** Maximum of 1 pint (0.5 lb. ae) per acre.
  - Maximum of 3 pints (1.5 lbs. ae) per acre per crop cycle.

**Sorghum Restrictions**

- **(PHI)** Do not harvest within 30 days of application.
- Limited to one Postemergence application per crop cycle.
  - **Postemergence:** Maximum of 2 pint (1.0 lb. ae) per acre.

## HOPS (Except CA)

| WEEDS IN CROPS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual broadleaf weeds** | 1 pint | Make directed applications to the row middles. Make up to 3 applications at 30-day intervals with the last application before harvest. |

**RESTRICTIONS AND LIMITATIONS FOR HOPS**

- Limited to 3 applications per crop cycle.
- Maximum of 1 pint (0.5 lb. ae) per acre per application.
- Maximum of 3 pints (1.5 lbs. ae) per acre per crop cycle.
- Minimum of 30 days between applications.
- Observe the preharvest interval (PHI) of 28 days.

## RICE

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Preplant** | 1 to 2 pints | Apply four or more weeks prior to planting rice. **DO NOT USE IN CALIFORNIA.** |
| **Postemergence** | 1 to 2-1/2 pints | Apply when rice is in the late tillering stage of development at the time of first joint development. Do not apply after panicle initiation, after rice internodes exceed one-half inch, at early seedling, early panicle, boot or heading stages. Consult local university or Agricultural Extension Service specialists for more specific information on rates and timing of application. **DO NOT USE IN CALIFORNIA.** |

**RESTRICTIONS AND LIMITATIONS FOR USE IN RICE**

- Do not apply more than a total of 2-1/2 pints per acre of this product to rice per growing season.
- Do not use on rice in California without an approved Supplemental Label allowing the use.
- Observe the preharvest interval (PHI) of 60 days.
- **Preplant:** Limited to 1 preplant application per crop cycle. Maximum of 2 pints (1.0 lb. ae) per acre per preplant application.
- **Postemergence:** Limited to 1 postemergence application per crop cycle. Maximum of 3 pints (1.5 lbs. ae) per acre per postemergence application.

## WILD RICE (For Use In Minnesota Only)

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Common waterplantain** | 1/2 pint | Broadcast in 4 to 10 gallons total spray volume. Apply after waterplantain has emerged from the water and when wild rice is in the 1 to 2 aerial leaf to early tillering stage. Do not spray after wild rice has reached the boot stage. |

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**RESTRICTIONS AND LIMITATIONS FOR USE IN WILD RICE**

- For use only on wild rice grown in commercial paddies.
- Do not apply to wild rice growing in lakes, rivers or streams.
- Water that is drained out of wild rice paddies is not to be used to irrigate other crops. In order to protect federally listed endangered or threatened species, the Minnesota Department of Agriculture has a program to pre-notify landowners where pesticide applications may affect federally listed endangered or threatened species.
- Limited to 1 application per crop cycle.
- Do not apply more than 1/2 pint per acre of 2,4-D Amine 4 (0.25 lb. ae/A) per use season.
- Observe the preharvest interval (PHI) of 60 days.

## SOYBEANS* (Preplant Only)

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| Postemergence | 3/4 to 1 pint | Apply not less than 15 days prior to planting soybeans, when weeds are small and actively growing. Use the higher rate on larger weeds and when perennials are present. |
| | >1 to 2 pints | Apply not less than 30 days prior to planting soybeans, when weeds are actively growing. |

In addition to those weeds found on the GENERAL WEED LIST, this product will suppress or control the following broadleaf weeds frequently encountered in reduced tillage soybean production systems: alfalfa*, bullnettle, smallflowered bittercress, Carolina geranium, smallflowered buttercup, common and rough cinquefoil, red clover*, horseweed or marestail, mousetail, wild mustard, field pennycress, cutleaf evening primrose, common purslane, speedwell, velvetleaf, and Virginia copperleaf.
* These weeds are only partially controlled.

Apply no more than 2.0 pints of this product in one season prior to planting soybeans. After applying, plant soybean seed as deep as practical or at least 1-1/2 to 2 inches deep. Adjust the planter press wheel, if necessary, to ensure that planted seed is completely covered.

If desired, this product may be applied pre-plant to soybeans in tank mixtures with other herbicides such as Poast®, Poast Plus®, Roundup®, Roundup D-Pak®, Honcho®, Gramoxone Extra®, Prowl®, Pursuit Plus®, Scepter®, Scepter 70 DG, Squadron® and others that are registered for pre-plant soybean use.

**NOTE**: Unacceptable injury to soybeans planted in fields previously treated with this product may occur and the extent of injury will depend on weather and agronomic factors such as the amount of weed vegetation and previous crop residue present that may be in effect between the time of application and the emergence of the soybean plant.

**RESTRICTIONS AND LIMITATIONS FOR USE IN SOYBEANS (PREPLANT)**

- Do not apply this product when weather conditions such as temperature, air inversions, or wind favor drift from treated areas to susceptible plants.
- Apply no more than 2.0 pints of this product per acre in one season prior to planting soybeans.
- Only one application per growing season, regardless of the application rate used, is allowed.
- Do not apply this product prior to planting soybeans if you are not prepared to accept the results of soybean injury including possible loss of stand and yield.
- Do not replant fields treated with this product in the same growing season with crops other than those labeled for 2,4-D pre-plant use.
- Do not mow or cultivate weeds prior to treating with this product as poor control may result.
- Do not cut for feed treated hay, forage, or fodder or graze treated soybeans to livestock.
- Do not apply this product pre-plant to soybeans in fields having a coarse-textured soil where the percent organic matter is <1.0%.
- Only one application of this product may be made prior to planting soybeans per growing season.
- Do not feed treated hay, forage, or fodder. Livestock should be restricted from feeding/grazing of treated cover crops.

***Not currently registered for use in California.**

## SUGARCANE

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Preemergence** | 4 pints | Apply before canes appear for control of emerged broadleaf weeds. **DO NOT USE IN CALIFORNIA.** |
| **Postemergence** | 1-1/2 to 4 pints | Apply after cane emerges and through lay-by. **DO NOT USE IN CALIFORNIA.** |

**RESTRICTIONS AND LIMITATIONS FOR USE IN SUGARCANE**

- Do not apply more than a total of 8 pints of this product to sugarcane per acre per growing season.
- Do not harvest cane prior to crop maturity.
- **Preemergence:** Limited to 1 application per crop cycle. Maximum of 4 pints (2.0 lb. ae) per acre per application.
- **Postemergence:** Limited to 1 application per crop cycle. Maximum of 4 pints (2.0 lb. ae) per acre per application.

SPECIMEN

## CONSERVATION RESERVE PROGRAM AREAS

| WEEDS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual broadleaf weeds**<br>In young grasses<br>In established grasses | <br>1/2 to 1 pint<br>1/2 to 2 pints | Apply to actively growing annual broadleaf weeds. Use 1/2 to 1 pint when weeds are small; use higher rates on older weeds. Do not apply to young grasses with fewer than 6 leaves or prior to tillering, as excessive injury may result. Do not apply more than 1 pint until grasses are well established as excessive injury may result. |
| **Biennial and perennial broadleaf weeds**<br>In established grasses | 2 to 4 pints | Treat when biennial weeds are in the seedling to rosette stage and before flower stalks become apparent. Treat perennial weeds in the bud to bloom stage. Apply to actively growing weeds. |

**RESTRICTIONS AND LIMITATIONS FOR USE ON CONSERVATION RESERVE PROGRAM AREAS**

- Use at least 2 gallons of water per acre by air and 5 gallons of water per acre by ground.
- Do not apply to grasses in the boot to dough stage if grass seed production is desired.
- Do not cut forage for hay within 7 days of application.
- **Postemergence:**
  - For susceptible annual and biennial broadleaf weeds, do not exceed 2 pints (1.0 lb. ae) per acre per application.
  - For moderately susceptible biennial and perennial broadleaf weeds and for difficult to control weeds and woody plants, do not exceed 4 pints (2.0 lbs. ae) per acre per application.
  - Spot treatments do not exceed 4 pints (2.0 lbs. ae) per acre.
  - Maximum of 2 applications per year.
  - Maximum of 8 pints (4.0 lbs. ae) per acre per year.
  - Minimum of 30 days between applications.
- If grass is to be cut for hay, Agricultural Use Requirements for the Worker Protection Standard are applicable.
- For program lands, such as Conservation Reserve Program, consult program rules to determine whether grass or hay may be used. The more restrictive requirements of the program rules or this label must be followed.

## ESTABLISHED GRASS PASTURES, RANGELAND AND GRASS CUT FOR HAY

| WEEDS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual broadleaf weeds** | 2 pints | Apply when weeds are small and actively growing and prior to bud stage. Spray while musk thistles or other biennial species are in the seedling to rosette stage and before flower stalks become apparent. |
| **Biennial and perennial broadleaf weeds** | 2 to 4 pints | The lower rate can be used in the spring during rosette stage. Use the highest rate in the fall or after flower stalks have developed. Do not apply to newly seeded areas until grass is well established. Do not apply to grass in the early boot through milk stage if grass seed production is desired. Bentgrass and legumes may be injured by this treatment. |

**RESTRICTIONS AND LIMITATIONS FOR USE ON ESTABLISHED GRASS PASTURES, RANGELAND AND GRASS CUT FOR HAY**

- Do not cut forage for hay within 7 days of application.
- Do not graze dairy cattle in treated areas for 7 days after application.
- **Postemergence:**
  - For susceptible annual and biennial broadleaf weeds, do not exceed 2 pints (1.0 lb. ae) per acre per application.
  - For moderately susceptible biennial and perennial broadleaf weeds and for difficult to control weeds and woody plants, do not exceed 4 pints (2.0 lbs. ae) per acre per application.
  - Spot treatments do not exceed 4 pints (2.0 lbs. ae) per acre.
  - Maximum of 2 applications per year.
  - Maximum of 8 pints (4.0 lbs. ae) per acre per year.
  - Minimum of 30 days between applications.
- If grass is to be cut for hay, Agricultural Use Requirements for the Worker Protection Standard are applicable.

SPECIMEN

## FALLOWLAND AND CROP STUBBLE

| WEEDS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| Annual broadleaf weeds | 1 to 2 pints | Use the lower rate when weeds are small (2 to 3 inches tall) and actively growing. Use the higher rate on older and drought-stressed plants. |
| Biennial broadleaf weeds | 2 to 4 pints | Spray when musk thistles or other biennial species are in the seedling to rosette stage and before flower stalks become apparent. The lower rate can be used in the spring during rosette stage. Use the highest rate in the fall or after flower stalks have developed. |
| Perennial broadleaf weeds | 2 to 4 pints | Spray weed in the bud to bloom stage or while in good vegetative growth. Do not disturb treated areas for at least 2 weeks after treatment, or until tops are dead. |
| Wild garlic and onion in crop stubble | 4 pints | Apply to new regrowth of wild garlic or onion which occurs in the fall following harvest of small grains, corn or grain sorghum. |

**RESTRICTIONS AND LIMITATIONS FOR USE IN FALLOWLAND AND CROP STUBBLE**

- Limit to two applications per year.
- Maximum of 4 pints (2.0 lbs. ae) per acre per application.
- Plant only labeled crops within 29 days following application.
- Minimum of 30 days between applications.

## GRASSES FOR SEED PRODUCTION

| WEEDS IN CROP | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual and perennial broadleaf weeds** | 2 to 4 pints | Apply to established stands in spring from tiller to early boot stage. **Do not spray in boot stage.** New spring seedings may be treated with the lower rate after grass seedlings have at least 5 leaves. Perennial weed regrowth may be treated in the fall. |

**RESTRICTIONS AND LIMITATIONS FOR USE ON GRASSES FOR SEED PRODUCTION**

- Do not graze dairy animals or cut forage for hay within 7 days of application.
- Maximum of 4 pints (2.0 lbs. ae) per acre per application.
- Limited to 2 applications per year.
- Minimum of 21 days between applications.

## NON-CROPLAND

**(Fencerows, Hedgerows, Roadsides, Ditches, Right-of-Way, Utility Power Lines, Railroads and Industrial Sites)**

| WEEDS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual broadleaf weeds** | 2 to 4 pints | Treat when weeds are young and actively growing. Perennial weeds should be near the bud stage, but not flowering at application. Do not use on susceptible southern grasses such as St. Augustine. Do not apply to newly seeded areas until grass is well established. Bentgrass, clover, legumes and dichondra may be injured by this treatment. |
| **Biennial and perennial broadleaf weeds** | 4 pints | |

**RESTRICTIONS AND LIMITATIONS FOR USE ON NON-CROPLAND**

- Maximum of 4 pints (2.0 lbs. ae) per acre per application.
- Applications to non-cropland areas are not applicable to treatment of commercial timber or other plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes.
- Limit 2 applications per year.
- Minimum 30 days between applications.

## SPOT TREATMENT IN NON-CROP AREAS

Mix 2 to 3 fluid ounces of this product in 3 gallons of water. Wet all weeds and stems thoroughly. For best results, treat when weeds are actively growing.

SPECIMEN

## ORNAMENTAL TURF AREAS

**Golf Courses, Cemeteries, Parks, Turfgrass, and Other Grass Areas**

| WEEDS | AMOUNT OF WEEDAR® 64 PER ACRE | DIRECTIONS |
|---|---|---|
| **Annual broadleaf weeds** | 2 to 3 pints | Treat when weeds are young and actively growing. Perennial weeds should be near the bud stage, but not flowering at application. Do not use on susceptible southern grasses such as St. Augustine. Do not apply to newly seeded area until grass is well established. Bentgrass, clover, legumes and dichondra may be injured by this treatment. |
| **Biennial and perennial broadleaf weeds** | 3 pints | |

**RESTRICTIONS AND LIMITATIONS FOR USE ON ORNAMENTAL TURF AREAS**

- Use sufficient gallonage for thorough and uniform coverage.
- Do not apply more than 2 broadcast applications per year per treatment site. This does not exclude spot treatments.
- Do not allow people (other than applicator) or pets on treatment area during application.
- Do not enter treatment areas until sprays have dried.
- Maximum of 3 pints (1.5 lbs. ae) per acre per application.
- Maximum of 6 pints (3.0 lbs. ae) per acre per year, excluding spot treatments.

## POPLAR/COTTONWOOD TREES GROWN FOR PULP BROADLEAF WEED CONTROL

This product may be applied through wick applicators or conventional ground sprayers. (Excluding irrigation systems) Do not allow this product to contact leaves or green bark of the tree. Use 1/2 pint to 3 pints per acre in enough water to provide uniform coverage prior to or after planting of Poplar/Cottonwood trees. Application during warm weather is preferred. Apply when weeds are actively growing, preferably before bud stage. Repeat treatment may be necessary for less susceptible weeds; re-apply as needed. Accord® may be mixed with this product to increase weed control. Follow both labels to determine correct rates. Two quarts or more of a spreader - activator per 100 gallons of spray solution may be added to improve herbicide performance.

**RESTRICTIONS AND LIMITATIONS FOR USE ON POPLAR/COTTONWOOD TREES GROWN FOR PULP BROADLEAF WEED CONTROL**

- Limited to 1 broadcast application per year. Maximum of 8 pints (4.0 lbs. ae) per acre per broadcast application.

## FORESTRY - TREE INJECTION

**For Controlling Species Such as Alder, Aspen, Birch, Blackgum, Cherry, Oak, Sweetgum, and Tulip Poplar**

Make injections as near to the root collar as possible, using one injection per inch of trunk dbh (4-1/2 feet). For resistant species such as hickory, injections should overlap. For best results, injections should be made during the growing season, May 15th through October 15th.

**For Dilute Injection**

Mix 1 gallon of product in 19 gallons of water for dilute injections.

**For Concentrate Injections**

Use 1 to 2 ml of concentrate WEEDAR® 64 per injection. The injection bit must penetrate the inner bark.

**RESTRICTIONS AND LIMITATIONS FOR USE ON FORESTRY - TREE INJECTION**

- Limited to 1 injection application per year. Maximum of 2 ml of 4.0 lbs. ae formulation per injection site.

## WEEDS AND BRUSH ON IRRIGATION CANAL DITCHBANKS

**(Seventeen Western States: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming)**

**For Control of Annual and Perennial Broadleaf Weeds**

Apply 1 to 2 quarts of this product per acre in approximately 20 to 100 gallons per acre. Treat when weeds are young and actively growing before the bud or early bloom stage. For harder-to-control weeds, a repeat spray after 30 days using the same rates may be needed for maximum results. Apply no more than two treatments per season.

**For Woody Brush and Patches of Perennial Broadleaf Weeds**

Mix 1/2 gallon of product in 150 gallons of water. Wet foliage thoroughly using about 1 gallon of solution per square rod.

**Spraying Instructions**

Apply with low pressure (10 to 40 psi) power spray equipment mounted on a truck, tractor, or boat. Apply while traveling upstream to avoid accidental concentration of chemical into water. Spray when the air is fairly calm, 5 mph or less. Do not use on small canals (less than 10 cfs) where water will be used for drinking purposes.

Boom spraying onto water surface must be held to a minimum and no cross-stream spraying to opposite banks should be permitted. When spraying shoreline weeds, allow no more than 2 foot overspray onto water with an average of less than 1 foot overspray to prevent introduction of greater than negligible amounts of chemical into the water.

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**RESTRICTIONS AND LIMITATIONS FOR USE ON IRRIGATION CANAL DITCHBANKS**

- Do not allow dairy animals to graze on treated areas for at least 7 days after spraying.
- Water within treated banks should not be fished.
- **Postemergence:** Limited to 2 applications per season. Maximum of 4 pints (2.0 lbs. ae) per acre per application. Minimum of 30 days between applications. Spot treatment permitted.

Do not use on small canals with a flow rate less than 10 cubic feet per second (CFS) where water will be used for drinking purposes. CFS may be estimated by using the formula below. The approximate velocity needed for the calculation can be determined by observing the length of time that it takes a floating object to travel a defined distance.

Divide the distance (ft.) by the time (sec.) to estimate velocity (ft. per sec.). Repeat 3 times and use the average to calculate CFS.

Average Width (ft.) x Average Depth (ft.) x Average Velocity (ft. per sec.) = CFS

**For ditchbank weeds:**

- Do not allow boom spray to be directed onto water surface.
- Do not spray across stream to opposite bank.

**For shoreline weeds:**

- Allow no more than 2 foot overspray onto water.

## AQUATIC WEED CONTROL

**For Use in Ponds, Lakes, Reservoirs, Marshes, Bayous, Drainage Ditches, Non-Irrigation Canals, Rivers and Streams that are Quiescent or Slow Moving.**

**NOTICE TO APPLICATORS**

**State and Local Coordination**

Before application, coordination and approval of local and state authorities may be required, either by letter of agreement or issuance of special permits for such use.

**Wind Velocity - Ground or Surface Application:** Do not apply when wind speeds are at or above 10 mph. **Air Application:** Do not apply when wind speeds are at or above 5 mph. The restrictions do not apply to subsurface applications used in weed control programs.

## WATER HYACINTH (*Eichornia crasipe*) - Directions For Use

This product will control water hyacinth with surface and air applications.

**Amounts to Use:** 2 to 4 quarts (4 lb. acid equivalent per gallon) per acre. **Spray the weed mass only.** Use 4 quarts when plants are matured or when the weed mass is dense.

**When To Apply:** Spray when water hyacinth plants are actively growing. Repeat as necessary to kill regrowth and hyacinth plants missed in the previous operation.

**How To Use - Surface Application:** Use power sprayers operated with a boom or spray gun mounted on a boat, tractor or truck. Thorough wetting of foliage is essential for maximum control. Use 100 to 400 gal. per acre of spray mixture. Special precautions such as the use of low pressure, large nozzles and thickening agents should be taken to avoid spray drift in areas of sensitive crops. For DIRECTA-SPRA™ operation use this product with 1 pint of drift control agent in 50 to 100 gallons of water. For other applications, follow the drift control agent label for mixing directions.

**Air Application:** Use drift control spray equipment or thickening agents mixed into the spray solution. Apply 1.0 gallon per acre of this product through standard boom systems with a minimum of 5 gallons of spray mix per acre. For MICROFOIL® drift control spray systems, apply this product in 12 to 15 gallons spray mix per acre.

| | | | | | |
|---|---|---|---|---|---|
| 2,4-D Acid Equivalent | 1/2 pound | 1 pound | 2 pounds | 3 pounds | 4 pounds |
| WEEDAR® 64 | 1 pint | 2 pints | 2 quarts | 3 quarts | 4 quarts |

## RESTRICTIONS

**FLOATING AND EMERGENT WEEDS:**

- Maximum of 8 pints per surface acre per application.
- Limited to 2 applications per season.
- Minimum of 21 days between applications.
- Spot treatments are permitted.

Apply to emergent aquatic weeds in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, non-irrigation canals, rivers, and streams that are quiescent or slow moving. Coordination and approval of local and state authorities may be required, either by letter of agreement or issuance of special permits for aquatic applications.

**WATER USE**

1 . Water for irrigation or sprays:

A. If treated water is intended to be used only for crops or non-crop areas that are labeled for direct treatment with 2,4-D such as pastures, turf, or cereal grains, the treated water may be used to irrigate and/or mix sprays for these sites at anytime after the 2,4-D aquatic application.

B. Due to potential phytotoxicity considerations, the following restrictions are applicable:

If treated water is intended to be used to irrigate or mix sprays for plants grown in commercial nurseries and greenhouses; and other plants or crops that are not labeled for direct treatment with 2,4-D, the water must not be used unless one of the following restrictions has been observed:

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i. A setback distance from functional water intake(s) of greater than or equal to 600 ft. was used for the application, or,

ii. A waiting period of 7 days from the time of application has elapsed, or,

iii. An approved assay indicates that the 2,4-D concentration is 100 ppb (0.1 ppm) or less at the water intake. Wait at least 3 days after application before initial sampling at water intake.

2. Drinking water (potable water):

A. Consult with appropriate state or local water authorities before applying this product to public waters. State or local agencies may require permits. The potable water use restrictions on this label are to ensure that consumption of water by the public is allowed only when the concentration of 2,4-D in the water is less than the MCL (Maximum Contaminant Level) of 70 ppb. Applicators should consider the unique characteristics of the treated waters to assure that 2,4-D concentrations in potable water do not exceed 70 ppb at the time of consumption.

B. For floating and emergent weed applications, the drinking water setback distance from functioning potable water intakes is greater than or equal to 600 ft.

C. If no setback distance of greater than or equal to 600 ft. is used for application, applicators or the authorizing organization must provide a drinking water notification prior to a 2,4-D application to the party responsible for public water supply or to individual private water uses. Notification to the party responsible for a public water supply or to individual private water users must be done in a manner to assure that the party is aware of the water use restrictions when this product is applied to potable water. The following is an example of a notification via posting, but other methods of notification which convey the above restrictions may be used and may be required in some cases under State or local law or as a condition of a permit.

**Example:** Posting notification should be located every 250 feet including the shoreline of the treated area and up to 250 feet of shoreline past the application site to include immediate public access points. Posting must include the day and time of application. Posting may be removed if analysis of a sample collected at the intake 3 or more days following application shows that the concentration in the water is less than 70 ppb (100 ppb for irrigation or sprays), or after 7 days following application, whichever occurs first.

**Text of notification:** Wait 7 days before diverting functioning surface water intakes from the treated aquatic site to use as drinking water, irrigation, or sprays, unless water at functioning drinking water intakes is tested at least 3 days after application and is demonstrated by assay to contain not more than 70 ppb 2,4-D (100 ppb for irrigation or sprays).

Application Date: _____ Time: _____ .

D. Following each application of this product, treated water must not be used for drinking water unless one of the following restrictions has been observed:

i. A setback distance from functional water intake(s) of greater than or equal to 600 ft. was used for the application, or

ii. A waiting period of 7 days from the time of application has elapsed, or,

iii. An approved assay indicates that the 2,4-D concentration is 70 ppb (0.07 ppm) or less at the water intake. Sampling for drinking water analysis should occur no sooner than 3 days after 2,4-D application. Analysis of samples must be completed by a laboratory that is certified under the Safe Drinking Water Act to perform drinking water analysis using a currently approved version of analytical Method Number 515, 555, other methods for 2,4-D as may be listed in Title 40 CFR, Part 141.24, or Method Number 4015 (immunoassay of 2,4-D) from U.S. EPA Test Methods for Evaluating Solid Waste SW-846.

E. Note: Existing potable water intakes that are no longer in use, such as those replaced by a connection to a municipal water system or a potable water well, are not considered to be functioning potable water intakes.

F. Drinking water setback distances do not apply to terrestrial applications of 2,4-D adjacent to water bodies with potable water intakes.

3. Except as stated above, there are no restrictions on using water from treated areas for swimming, fishing, watering livestock or domestic purposes.

## WATER MILFOIL (*Myriophyllum spicatum*) - Directions For Use

This product will control water milfoil with surface, subsurface and air applications.

**How To Use:** To control water milfoil when less than 5 gallons of concentrate per acre is recommended, dilute the concentrate with water to apply a minimum of 5 gallons of spray mix per acre. Do not treat within 1/2 mile of potable water intakes. Shoreline areas should be treated by sub-surface injection applied by boat to avoid aerial drift. Do not apply when weather conditions favor drift from target area. Do not contaminate water by cleaning of equipment washwaters.

**Open Water Areas:** To reduce contamination and prevent undue exposure to fish and other aquatic organisms, do not treat water areas that are not infested with aquatic weeds.

**Amounts To Use:** Apply 2.5 to 2.75 gallons of this product per acre. The higher rate is used in areas of greater water exchange. These areas may require a repeat application.

**When To Apply:** For best results, apply in spring or early summer when milfoil starts to grow. This timing can be checked by sampling the lake bottom in areas heavily infested with weeds the year before.

**Subsurface Application:** Apply 2.5 to 2.75 gallons of this product per acre as a concentrate directly into the water through boat mounted distribution systems.

**Surface Application:** Apply 2.5 to 2.75 gallons of this product per acre in a minimum spray volume of 5 gallons mix per acre.

**Air Application:** Use drift control spray equipment or thickening agents mixed into the spray solution. Apply 2.5 to 2.75 gallons per acre of this product through standard boom systems with a minimum of 5 gallons of spray mix per acre. For MICROFOIL® drift control spray systems apply this product in 12 to 15 gallons spray mix per acre.

Do not apply within 21 days of previous application.

When treating moving bodies of water, applications must be made while traveling upstream to prevent concentration of 2,4-D downstream from the application.

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## RESTRICTIONS

**SUBMERSED AQUATIC WEEDS:**

- Maximum of 22.7 pints (10.8 lbs. ae) per acre-foot per application.
- Limited to 2 applications per season.

Apply to aquatic weeds in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, non-irrigation canals, rivers, and streams that are quiescent or slow moving. Do not apply within 21 days of previous application. When treating moving bodies of water, applications must be made while traveling upstream to prevent concentration of 2,4-D downstream from the application. Coordination and approval of local and State authorities may be required, either by letter of agreement or issuance of special permits for such use.

**TABLE 1. AMOUNT OF 2,4-D TO APPLY FOR A TARGET SUBSURFACE CONCENTRATION**

| SURFACE AREA | Average Depth | For Typical Conditions 2 ppm 2,4-D ae/acre-foot | For Difficult Conditions* 4 ppm 2,4-D ae/acre-foot |
|---|---|---|---|
| 1 Acre | 1 ft. | 5.4 lbs. (11.3 pts. product) | 10.8 lbs. (22.7 pts. product) |
| | 2 ft. | 10.8 lbs. (22.7 pts. product) | 21.6 lbs. (45.4 pts. product) |
| | 3 ft. | 16.2 lbs. (34.1 pts. product) | 32.4 lbs. (68.2 pts. product) |
| | 4 ft. | 21.6 lbs. (45.4 pts. product) | 43.2 lbs. (90.9 pts. product) |
| | 5 ft. | 27.0 lbs. (56.8 pts. product) | 54.0 lbs. (113.6 pts. product) |

* Examples include spot treatment of pioneer colonies of Eurasian Water Milfoil and certain difficult to control aquatic species.

**WATER USE**

1 . Water for irrigation or sprays:

A. If treated water is intended to be used only for crops or non-crop areas that are labeled for direct treatment with 2,4-D such as pastures, turf, or cereal grains, the treated water may be used to irrigate and/or mix sprays for these sites at anytime after the 2,4-D aquatic application.

B. Due to potential phytotoxicity and/or residue considerations, the following restrictions are applicable:

If treated water is intended to be used to irrigate or mix sprays for unlabeled crops, noncrop areas or other plants not labeled for direct treatment with 2,4-D, the water must not be used unless one of the following restrictions has been observed:

i. A setback distance described in the Drinking Water Setback Table was used for the application, or,

ii. A waiting period of 21 days from the time of application has elapsed, or,

iii. An approved assay indicates that the 2,4-D concentration is 100 ppb (0.1 ppm) or less at the water intake. See Table 3 for the waiting period after application but before taking the initial sampling at water intake.

2. Drinking water (potable water):

A. Consult with appropriate state or local water authorities before applying this product to public waters. State or local agencies may require permits. The potable water use restrictions on this label are to ensure that consumption of water by the public is allowed only when the concentration of 2,4-D in the water is less than the MCL (Maximum Contaminant Level) of 70 ppb. Applicators should consider the unique characteristics of the treated waters to assure that 2,4-D concentrations in potable water do not exceed 70 ppb at the time of consumption.

B. For submersed weed applications, the drinking water setback distances from functioning potable water intakes are provided in Table 2. Drinking Water Setback Distance (below).

C. If no setback distance from the Drinking Water Setback Distance Table (Table 2) is to be used for the application, applicators or the authorizing organization must provide a drinking water notification and an advisory to shut off all potable water intakes prior to a 2,4-D application. Notification to the party responsible for a public water supply or to individual private water users must be done in a manner to assure that the party is aware of the water use restrictions when this product is applied to potable water. The following is an example of a notification via posting, but other methods of notification which convey the above restrictions may be used and may be required in some cases under State or local law or as a condition of a permit.

**Example:** Posting notification should be located every 250 feet including the shoreline of the treated area and up to 250 feet of shoreline past the application site to include immediate public access points. Posting should include the day and time of application. Posting may be removed if analysis of a sample collected at the intake no sooner than stated in Table 3 (below) shows that the concentration in the water is less than 70 ppb (100 ppb for irrigation or sprays), or after 21 days following application, whichever occurs first.

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**Text of notification:** Wait 21 days before diverting functioning surface water intakes from the treated aquatic site to use as drinking water, irrigation, or sprays, unless water at functioning drinking water intakes is tested no sooner than (insert days from Table 3) and is demonstrated by assay to contain not more than 70 ppb 2,4-D (100 ppb for irrigation or sprays).

Application Date: _____ Time: _____ .

D. Following each application of this product, treated water must not be used for drinking water unless one of the following restrictions has been observed:

i. A setback distance described in the Drinking Water Setback Distance Table was used for the application, or

ii. A waiting period of at least 21 days from the time of application has elapsed, or,

iii. An approved assay indicates that the 2,4-D concentration is 70 ppb (0.07 ppm) or less at the water intake. Sampling for drinking water analysis should occur no sooner than stated in Table 3. Analysis of samples must be completed by a laboratory that is certified under the Safe Drinking Water Act to perform drinking water analysis using a currently approved version of analytical Method Number 515, 555, other methods for 2,4-D as may be listed in Title 40 CFR, Part 141.24, or Method Number 4015 (immunoassay of 2,4-D) from U.S. EPA Test Methods for Evaluating Solid Waste SW-846.

E. Note: Existing potable water intakes that are no longer in use, such as those replaced by a connection to a municipal water system or a potable water well, are not considered to be functioning potable water intakes.

F. Drinking water setback distances do not apply to terrestrial applications of 2,4-D adjacent to water bodies with potable water intakes.

3. Except as stated above, there are no restrictions on using water from treated areas for swimming, fishing, watering livestock or domestic purposes.

**Table 2. Drinking Water Setback Distance for Submersed Weed Applications**

| APPLICATION RATE AND MINIMUM SETBACK DISTANCE (FEET) FROM FUNCTIONING POTABLE WATER INTAKE | | | |
|---|---|---|---|
| **1 ppm*** | **2 ppm*** | **3 ppm*** | **4 ppm*** |
| 600 | 1200 | 1800 | 2400 |

* ppm acid equivalent target water concentration

**Table 3. Sampling for Drinking Water Analysis After 2,4-D Application for Submerged Weed Applications**

| MINIMUM DAYS AFTER APPLICATION BEFORE INITIAL WATER SAMPLING AT THE FUNCTIONING POTABLE WATER INTAKE | | | |
|---|---|---|---|
| **1 ppm*** | **2 ppm*** | **3 ppm*** | **4 ppm*** |
| 5 | 10 | 10 | 14 |

* ppm acid equivalent target water concentration

Use of this product in certain portions of California, Oregon, and Washington is subject to the January 22, 2004 Order for injunctive relief in Washington Toxics Coalition, et al. v. EPA, C01 32C, (W.D. WA). For further information, please refer to EPA Web Site: http://www.epa.gov/espp.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

**PESTICIDE STORAGE:** Store in original container in a dry, secured storage area. Keep container tightly closed when not in use. Store at temperature above 32°F. If allowed to freeze, warm to at least 40°F and remix before using. Freezing does not alter this product.

**PESTICIDE DISPOSAL:** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law and may contaminate ground water. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**CONTAINER DISPOSAL:**

**Nonrefillable Containers 5 Gallons or Less:** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**Nonrefillable Containers Larger than 5 Gallons:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

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**Refillable Container Larger than 5 Gallons: Refillable container.** Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

## WARRANTY DISCLAIMER

**The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE.** UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

## LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR RISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

**If you do not agree with or do not accept any of directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.**

(RV090810)

## NOTICE TO BUYER

Purchase of this material does not confer any rights under patents governing this product or the use thereof in countries outside of the United States.

WEEDAR is a Registered Trademark of Nufarm, Inc.

All other trademarks are the property of their respective owners.

SPECIMEN

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** **WEEDAR® 64 Broadleaf Herbicide**
**EPA Reg. No.:** 71368-1
**Synonyms:** 2,4-D DMA; 2,4-Dichlorophenoxyacetic acid, dimethylamine salt
**Product Type:** Herbicide

**Company Name:** Nufarm Inc.
11901 S. Austin Avenue
Alsip, IL 60803

**Telephone Numbers:** **For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, Call CHEMTREC Day or Night: 1-800-424-9300**
**For Medical Emergencies Only, Call 1-877-325-1840**

**Date of Issue:** October 7, 2013 **Supersedes:** June 20, 2012
**Sections Revised:** 1

## 2. HAZARDS IDENTIFICATION

**Emergency Overview:**
**Appearance and Odor:** Clear, colorless to pale yellow liquid with a phenolic-amine odor.
**Warning Statements:** Keep out of reach of children. DANGER. Corrosive, causes irreversible eye damage. Harmful if swallowed. Avoid breathing vapors or spray mist. Do not get in eyes, on skin or on clothing.

**Potential Health Effects:**
**Likely Routes of Exposure:** Inhalation, eye and skin contact.
**Eye Contact:** Causes corneal opacity, irreversible eye damage. Vapors and mist can cause irritation.
**Skin Contact:** Slightly irritating based on toxicity studies. Overexposure by skin absorption may cause symptoms similar to those for ingestion.
**Ingestion:** Harmful if swallowed. May cause nausea, vomiting, abdominal pain, decreased blood pressure, muscle weakness, muscle spasms.
**Inhalation:** Low inhalation toxicity based on toxicity studies. Overexposure by inhalation may cause upper respiratory tract irritation and symptoms similar to those from ingestion.
**Medical Conditions Aggravated by Exposure:** Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease.

See Section 11: TOXICOLOGICAL INFORMATION for more information.

**Potential Environmental Effects:**
This product is toxic to fish and aquatic invertebrates. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

See Section 12: ECOLOGICAL INFORMATION for more information.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

| COMPONENT | CAS NO. | % BY WEIGHT |
|---|---|---|
| Dimethylamine Salt of 2,4-Dichlorophenoxyacetic Acid | 2008-39-1 | 46.8 |
| Inert Ingredients | | 53.2 |

## 4. FIRST AID MEASURES

**If in Eyes:** Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
**If Swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
**If on Skin or Clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.
**If Inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
**Note to Physician:** This product contains a phenoxy herbicidal chemical. There is no specific antidote. All treatments should be based on observed signs and symptoms of distress in the patient. Overexposure to materials other than this product may have occurred.

## 5. FIRE FIGHTING MEASURES

**Flash Point:** Not applicable due to aqueous formulation
**Autoignition Temperature:** Not determined **Flammability Limits:** Not determined

**Extinguishing Media:** Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.
**Special Fire Fighting Procedures:** Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.
**Unusual Fire and Explosion Hazards:** Containers will burst from internal pressure under extreme fire conditions. If water is used to fight fire or cool containers, dike to prevent runoff contamination of municipal sewers and waterways.
**Hazardous Decomposition Materials (Under Fire Conditions):** May produce gases such as hydrogen chloride and oxides of carbon and nitrogen.

**National Fire Protection Association (NFPA) Hazard Rating:**
**Rating for this product: Health:** 3 **Flammability:** 1 **Reactivity:** 0
Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.
**Environmental Precautions:** Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.
**Methods for Containment:** Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.
**Methods for Cleanup and Disposal:** Pump any free liquid into an appropriate closed container. Collect washings for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.
**Other Information:** Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

## 7. HANDLING AND STORAGE

**Handling:**
Avoid breathing vapors or spray mist. Do not get in eyes, on skin or on clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. If pesticide gets on skin, wash immediately with soap and water. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**Storage:**
Store in original container in a dry, secured storage area. Keep container tightly closed when not in use. Store at temperatures above 32° F. If allowed to freeze, warm to at least 40° F and remix before using. Freezing does not alter the product. Do not contaminate water, food or feed by storage or disposal.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering Controls:**
Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

**Personal Protective Equipment:**
**Eye/Face Protection:** To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.
**Skin Protection:** To avoid contact with skin, wear long pants, long-sleeved shirt, socks, shoes and chemical-resistant gloves. For use according to product label, chemical-resistant gloves are not required for applicators using ground boom equipment. Wear a chemical-resistant apron when mixing or loading, cleaning up spills or equipment, or otherwise exposed to the concentrate. An emergency shower or water supply should be readily accessible to the work area.
**Respiratory Protection:** Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.
**General Hygiene Considerations:** Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

**Exposure Guidelines:**

| | OSHA | | ACGIH | | |
|---|---|---|---|---|---|
| **Component** | TWA | STEL | TWA | STEL | Unit |
| DMA Salt of 2,4-D | 10* | NE | 10* | NE | $mg/m^3$ |

*Based on adopted limit for 2,4-D NE = Not Established

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance and Odor:** Clear, colorless to pale yellow liquid with a phenolic-amine odor.

| | | | |
|---|---|---|---|
| **Boiling Point:** | Not determined | **Solubility in Water:** | Soluble |
| **Density:** | 9.7 pounds/gallon | **Specific Gravity:** | 1.163 @ 20°C |
| **Evaporation Rate:** | Not determined | **Vapor Density:** | Not determined |
| **Freezing Point:** | Not determined | **Vapor Pressure:** | Not determined |
| **pH:** | 7 - 9 | **Viscosity:** | 10.5 cPs @ 21°C |

**Note:** Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

## 10. STABILITY AND REACTIVITY

**Chemical Stability:** This material is stable under normal handling and storage conditions.
**Conditions to Avoid:** Excessive heat. Do not store near heat or flame.
**Incompatible Materials:** Strong oxidizing agents: bases and acids.
**Hazardous Decomposition Products:** Under fire conditions may produce gases such as hydrogen chloride and oxides of carbon and nitrogen.
**Hazardous Reactions:** Hazardous polymerization will not occur.

## 11. TOXICOLOGICAL INFORMATION

**Toxicological Data:**
Except as noted, data from laboratory studies conducted on this product are summarized below:
**Oral:** Rat $LD_{50}$: 1,030 mg/kg (female) (estimated based on mortalities for doses tested)
**Dermal:** Rabbit $LD_{50}$: >5,000 mg/kg (data on similar product)
**Inhalation:** Rat 4-hr $LC_{50}$: >2.06 mg/L
**Eye Irritation:** Rabbit: Corrosive/severely irritating (data on similar product)
**Skin Irritation:** Rabbit: Slightly irritating (data on similar product)
**Skin Sensitization:** Not a contact sensitizer in guinea pigs following repeated skin exposure.

**Subchronic (Target Organ) Effects:** Repeated overexposure to phenoxy herbicides may cause effects to liver, kidneys, blood chemistry, and gross motor function. Rare cases of peripheral nerve damage have been reported, but extensive animal studies have failed to substantiate these observations, even at high doses for prolonged periods.
**Carcinogenicity / Chronic Health Effects:** Prolonged overexposure to phenoxy herbicides can cause liver, kidney and muscle damage. The International Agency for Research on Cancer (IARC) lists exposure to chlorophenoxy herbicides as a class 2B carcinogen, the category for limited evidence for carcinogenicity in humans. However, more current 2,4-D lifetime feeding studies in rats and mice did not show carcinogenic potential. The U.S. EPA has given 2,4-D a Class D classification (not classifiable as to human carcinogenicity).
**Reproductive Toxicity:** No impairment of reproductive function attributable to 2,4-D has been noted in laboratory animal studies.
**Developmental Toxicity:** Studies in laboratory animals with 2,4-D have shown decreased fetal body weights and delayed development in the offspring at doses toxic to mother animals.
**Genotoxicity:** There have been some positive and some negative studies, but the weight of evidence is that 2,4-D is not mutagenic.

**Assessment Carcinogenicity:**
This product contains substances that are considered to be probable or suspected human carcinogens as follows:

| | Regulatory Agency Listing As Carcinogen | | | |
|---|---|---|---|---|
| **Component** | **ACGIH** | **IARC** | **NTP** | **OSHA** |
| Chlorophenoxy Herbicides | No | 2B | No | No |

See Section 2: HAZARDS IDENTIFICATION for more information.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity:**

Data on 2,4-D, Dimethylamine Salt:

| | | | |
|---|---|---|---|
| 96-hour $LC_{50}$ Bluegill: | 524 mg/l | Bobwhite Quail Oral $LD_{50}$: | 500 mg/kg |
| 96-hour $LC_{50}$ Rainbow Trout: | 250 mg/l | Mallard Duck 8-day Dietary $LC_{50}$: | >5,620 ppm |
| 48-hour $EC_{50}$ Daphnia: | 184 mg/l | | |

**Environmental Fate:**

In laboratory and field studies, 2,4-D DMA salt rapidly dissociated to parent acid in the environment. The typical half-life of the resultant 2,4-D acid ranged from a few days to a few weeks.

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method:**

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law and may contaminate ground water. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Container Handling and Disposal:**

**Nonrefillable Containers 5 Gallons or Less:** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned stay out of smoke.

**Nonrefillable containers larger than 5 gallons:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. **Pressure rinse as follows:** Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refillable containers larger than 5 gallons:** Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water and, if possible, spray all sides while adding water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

## 14. TRANSPORTATION INFORMATION

Follow the precautions indicated in Section 7: HANDLING AND STORAGE of this MSDS.

**DOT**
**< 25 gallons per completed package**
Non Regulated

**≥ 25 gallons per completed package**
UN 3082, RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (2,4-D SALT), 9, III

**IMDG**
Non Regulated

**IATA**
Non Regulated

## 15. REGULATORY INFORMATION

**U.S. Federal Regulations:**

**TSCA Inventory:** This product is exempted from TSCA because it is solely for FIFRA regulated use.

**SARA Hazard Notification/Reporting:**
**Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):**
Immediate and Delayed

**Section 313 Toxic Chemical(s):**
Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7), 38.9% equivalent by weight in product

**Reportable Quantity (RQ) under U.S. CERCLA:**
Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7) 100 pounds

**RCRA Waste Code:**
Acetic Acid, (2,4-Dichlorophenoxy)- (CAS No. 94-75-7) U240

**State Information:**
Other state regulations may apply. Check individual state requirements.

**California Proposition 65:** Not Listed

## 16. OTHER INFORMATION

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that

labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Weedar is a registered trademark of Nufarm Americas Inc.

# Glyphosate (Roundup Custom)
# Label and MSDS

# ATTENTION:

This specimen label is provided for general information only.

- This pesticide product may not yet be available or approved for sale or use in your area.
- It is your responsibility to follow all Federal, state and local laws and regulations regarding the use of pesticides.
- Before using any pesticide, be sure the intended use is approved in your state or locality.
- Your state or locality may require additional precautions and instructions for use of this product that are not included here.
- Monsanto does not guarantee the completeness or accuracy of this specimen label. The information found in this label may differ from the information found on the product label. You must have the EPA approved labeling with you at the time of use and must read and follow all label directions.
- You should not base any use of a similar product on the precautions, instructions for use or other information you find here.
- Always follow the precautions and instructions for use on the label of the pesticide you are using.

21153L1-37

Roundup CUSTOM™

FOR AQUATIC & TERRESTRIAL USE

TRUEBLUE ADVANTAGE PROVEN | RELIABLE | SUPPORTED

## Complete Directions for Use

Roundup Custom™ for Aquatic and Terrestrial Use is a complete broad-spectrum postemergence herbicide for aquatic, crop, non-agricultural crop, industrial, turf, ornamental, forestry, roadside, and utility rights-of-way weed control.

EPA Reg. No. 524-343 2012-2

| GROUP | 9 | HERBICIDE |
|---|---|---|

**AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.**

Read the entire label before using this product.

Use only according to label instructions.

Not all products listed on this label are registered for use in California. Check the registration status of each product in California before using.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

**PRODUCT INFORMATION**

## 1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt.....53.8%
OTHER INGREDIENTS:..... 46.2%
100.0%

*Contains 648 grams per liter or 5.4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per liter or 4.0 pounds per U.S. gallon of the acid, glyphosate.

No license granted under any non-U.S. patent(s).

## 2.0 IMPORTANT PHONE NUMBERS

FOR **PRODUCT INFORMATION** OR ASSISTANCE IN USING THIS PRODUCT, CALL TOLL-FREE, **1-800-332-3111.**

IN CASE OF AN **EMERGENCY** INVOLVING THIS PRODUCT, OR FOR **MEDICAL ASSISTANCE**, CALL COLLECT, DAY OR NIGHT, **(314)-694-4000.**

## 3.0 PRECAUTIONARY STATEMENTS

### 3.1 Hazards to Humans and Domestic Animals

Keep Out of Reach of Children.

CAUTION!

DOMESTIC ANIMALS: This product is considered to be relatively nontoxic to dogs and other domestic animals; however, ingestion of this product or large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (vomiting, diarrhea, colic, etc.). If such symptoms are observed, provide the animal with plenty of fluids to prevent dehydration. Call a veterinarian if symptoms persist for more than 24 hours.

**Personal Protective Equipment (PPE)**

**Applicators and other handlers must wear:** long-sleeved shirt and long pants, shoes plus socks. Follow manufacturer's instructions for cleaning/maintaining PPE (Personal Protective Equipment). If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Engineering Control Statements: When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

**User Safety Recommendations:**

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove contaminated clothing and wash clothing before reuse.

### 3.2 Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of SPILL or LEAK, soak up and remove to a landfill.

### 3.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

## DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. This product can only be used in accordance with the Directions for Use on this label or in separately published Monsanto Supplemental Labeling or Fact Sheets. Supplemental labeling can be found on the Internet at www.cdms.net, www.agrian.com or www.greenbook.net websites but may not be approved for use in all states. Copies can also be obtained by contacting your Authorized Monsanto Retailer or Monsanto Company Representative.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any

requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

### Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, are: coveralls, shoes plus socks, and chemical resistant gloves made of any waterproof material.

### Non-Agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep people and pets off treated areas until spray solution has dried.

## 4.0 STORAGE AND DISPOSAL

Proper pesticide storage and disposal are essential to protect against exposure to people and the environment due to leaks and spills, excess product or waste, and vandalism. Do not allow this product to contaminate water, foodstuffs, feed or seed by storage and disposal.

**PESTICIDE STORAGE:** STORE ABOVE 5°F (-15°C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using. Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination.

**PESTICIDE DISPOSAL:** To avoid wastes, use all material in this container, including rinsate, by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program. Such programs are often run by state or local governments or by industry. All disposal must be in accordance with applicable federal, state and local regulations and procedures.

**CONTAINER HANDLING AND DISPOSAL:** See container label for container handling and disposal instructions and refilling limitations.

## 5.0 PRODUCT INFORMATION

**Product Description:** This product is a postemergent, systemic herbicide with no residual soil activity. It gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid and may be applied through standard equipment after dilution and mixing with water or other carriers according to label instructions.

**Time to Symptoms:** This product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts. Effects are visible on most annual weeds within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms.

**Stage of Weeds:** Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. See the **WEEDS CONTROLLED** section of this label for specific weed rates.

Always use the higher product application rate in the range when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area. Reduced weed control may result from treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions.

**Mode of Action in Plants:** The active ingredient in this product inhibits production of an enzyme in plants and microorganisms that is essential to formation of specific amino acids.

**Cultural Considerations:** Reduced control could result when applications are made to annual or perennial weeds that have been mowed, grazed or cut, and have not been allowed to regrow to the specified stage for treatment.

**Rainfastness:** Heavy rainfall soon after application may wash this product off of the foliage and a repeat application may be required for adequate weed control.

**Spray Coverage:** For best results, spray coverage should be uniform and complete. Do not spray foliage to the point of run-off.

**No Soil Activity:** Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

**Maximum Application Rates:** The maximum application or use rates stated throughout this label are given in units of volume (fluid ounces or quarts) of this product per acre. However, the maximum allowed application rates apply to this product combined with the use of any and all other herbicides containing the active ingredient glyphosate, whether applied separately or as tank mixtures, on a basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate-containing product is applied to the same site within the same year, you must ensure that the total use of glyphosate (pounds acid equivalents) does not exceed the maximum allowed. The combined total of all treatments must not exceed 8 quarts of this product (8 pounds of glyphosate acid) per acre per year. See the **INGREDIENTS** section of this label for necessary product information.

**ATTENTION**

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) that are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

**NOTE:** Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences.

## 5.1 Weed Resistance Management

| GROUP | 9 | HERBICIDE |
|---|---|---|

Glyphosate, the active ingredient in this product, is a Group 9 herbicide based on the mode of action classification system of the Weed Science Society of America. Any weed population may contain plants naturally resistant to Group 9 herbicides. Weed species resistant to Group 9 herbicides may be effectively managed utilizing another herbicide from a different Group or using other cultural or mechanical practices.

To minimize the occurrence of glyphosate-resistant biotypes observe the following general weed management recommendations:

- Scout your application site before and after herbicide applications.
- Control weeds early when they are relatively small.
- Incorporate other herbicides and cultural or mechanical practices as part of your weed control system where appropriate.
- Use the labeled rate for the most difficult to control weed in the site. Avoid tank-mixtures with other herbicides that reduce this product's efficacy through antagonism or with tank mixtures that encourage rates of this product below those specified on this label.
- Control weed escapes and prevent weeds from setting seeds.
- Clean equipment before moving from site to site to minimize spread of weed seed.
- Use new commercial seed as free of weed seed as possible.
- Report any incidence of repeated non-performance of this product on a particular weed to your Monsanto representative, local retailer, or county extension agent.

## 5.2 Management of Glyphosate Resistant Weed Biotypes

**NOTE:** Appropriate testing is critical in order to confirm weed resistance to glyphosate. Contact your Monsanto representative to determine if resistance has been confirmed to any particular weed biotype in your area. Directions for the control of biotypes confirmed to be resistant to glyphosate are made available on separately published supplemental labeling or Fact Sheets for this product and may be obtained from your local retailer or Monsanto representative.

Since the occurrence of new glyphosate resistant weeds cannot be determined until after product use and scientific confirmation, Monsanto Company is not responsible for any losses that may result from the failure of this product to control glyphosate-resistant weed biotypes.

The following good weed management practices are recommended to reduce the spread of confirmed glyphosate resistant biotypes:

- If a naturally occurring resistant biotype is present at your site, this product may be tank-mixed or applied sequentially with an appropriately labeled herbicide with a different mode of action to achieve control.

- Cultural and mechanical control practices may also be used as appropriate.
- Scout treated sites after herbicide applications and control escapes of resistant biotypes before they set seed.
- Thoroughly clean equipment before leaving sites known to contain resistant biotypes.

# 6.0 MIXING

Spray solutions of this product can be mixed, stored and applied using only clean stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS.

Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations.

Clean sprayer parts promptly after using this product by thoroughly flushing with water.

**NOTE:** REDUCED PRODUCT PERFORMANCE CAN OCCUR IF WATER CONTAINING SOIL SEDIMENT IS USED AS CARRIER OR WATER THAT IS VISIBLY MUDDY OR MURKY FROM PONDS AND DITCHES.

## 6.1 Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of clean water. Add the labeled amount of this product near the end of the filling process and mix gently (well). During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

## 6.2 Tank Mixtures

This product does not provide residual weed control. This product can be tank-mixed with other herbicides to provide residual weed control, a broader weed control spectrum or an alternate mode of action. Always read and follow label directions for all products in the tank mixture.

When this product is tank-mixed with other products, refer to these product labels for approved sites and application rates. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture. Any labeled rate of this product may be used in a tank mix.

When this label lists a tank mixture with a generic active ingredient such as diuron, 2,4-D or dicamba, the user is responsible for ensuring the mixture product label allows the specific application.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly listed in this label. Mixing this product with herbicides or other materials not specified on this label may result in reduced performance.

This product provides control of the emerged weeds listed on this label. When applied as a tank mixture, the following herbicides will provide preemergence and/or postemergence control of the weeds listed in the individual product labels.

This product can be tank-mixed with the following products. Any labeled rate of this product can be used in a tank mixture with these products. User is responsible for ensuring that the specific product is registered for use on the target site. Refer to these product labels for approved application sites and application rates. Read and carefully observe the cautionary statements and all other information on the labels of all the herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture.

**Tank-mix Products**

| | |
|---|---|
| Arsenal | Krovar I DF + 2,4-D |
| Banvel | Krovar I DF + Garlon 3A |
| 2,4-D | Krovar I DF + Garlon 4 |
| Garlon 3A | Oust XP |
| Garlon 4 | Oust XP + 2,4-D |
| diuron | Oust XP + Garlon 3A |
| diuron + 2,4-D | Oust XP + Garlon 4 |
| diuron + Garlon 3A | Ronstar |
| diuron + Garlon 4 | Spike 80W |
| Hyvar X | Spike 80W + 2,4-D |
| Hyvar X + 2,4-D | Spike 80W + Garlon 3A |
| Hyvar X + Garlon 3A | Spike 80W + Garlon 4 |
| Hyvar X + Garlon 4 | Surflan |
| Krovar I DF | |

When used in combination as recommended by Monsanto Company, the liability of Monsanto shall in no manner extend to any damage, loss or injury not solely and directly caused by the inclusion of the Monsanto product in such combination use.

## 6.3 Tank Mixing Procedure

When tank mixing, read and carefully observe label directions, cautionary statements and all information on the labels of all products used. Add the tank-mix product to the tank as directed by the label. Maintain agitation and add the specified amount of this product.

Maintain good agitation at all times during the mixing process. Ensure that the tank-mix products are well mixed with the spray solution before adding this product.

Mix only the quantity of spray solution that can be used during the same day. Tank mixtures allowed to stand overnight may result in reduced weed control.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh.

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Ensure that the specific tank mixture product is registered for application at the desired site.

## 6.4 Mixing Percent Solutions

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

**Spray Solution**

| Desired Volume | Amount of Roundup Custom for Aquatic and Terrestrial Use | | | | | |
|---|---|---|---|---|---|---|
| | 0.5% | 0.75% | 1% | 1.5% | 4% | 8% |
| 1 gal | 2/3 oz | 1 oz | 1.3 oz | 2 oz | 5 oz | 10 oz |
| 25 gal | 1 pt | 1.5 pt | 1 qt | 1.5 qt | 4 qt | 2 gal |
| 100 gal | 2 qt | 3 qt | 1 gal | 1.5 gal | 4 gal | 8 gal |

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, it is suggested that the specified amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

## 6.5 Surfactant

This product requires the use of a nonionic surfactant unless otherwise specified. When using this product, unless otherwise specified, mix 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution. Increasing the rate of surfactant may enhance performance. Examples of when to use the higher surfactant rate include, but are not limited to: hard to control woody brush, trees and vines, high water volumes, adverse environmental conditions, tough to control weeds, weeds under stress, surfactants with less than 70 percent active ingredient, tank mixes, etc.

Always read and follow the manufacturer's surfactant label for best results. Carefully observe all cautionary statements and other information appearing in the surfactant label.

## 6.6 Colorants or Dyes

Approved colorants or marking dyes may be added to this product. At lower rates or dilution, colorants or dyes used in spray solutions of this product may reduce performance. Use colorants or dyes according to the manufacturer's instructions.

## 6.7 Drift Reduction Additives

Drift reduction additives can be used with all equipment types, except wiper applicators and sponge bars. When a drift reduction additive is used, read and carefully observe precautionary statements and all other information appearing on the additive label. The use of drift reduction additives can affect spray coverage which may result in reduced performance.

# 7.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

**SPRAY DRIFT MANAGEMENT**

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator and/or the grower are responsible for considering all these factors when making decisions.

# 7.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

FOR AERIAL APPLICATION IN CALIFORNIA, OR SPECIFIC COUNTIES THEREIN, REFER TO THE FEDERAL SUPPLEMENTAL LABELING FOR AERIAL APPLICATIONS OF THIS PRODUCT IN THAT STATE OR COUNTY FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

This product, tank-mixed with dicamba, may not be applied by air in California. Only 2,4-D amine formulations may be applied by air in California.

Use the labeled rates of this herbicide in 3 to 25 gallons of water per acre.

TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Avoid direct application to any body of water. Drift control reduction additives may be used. When a drift control reduction additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

**Aircraft Maintenance**

PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion. To prevent corrosion of exposed parts, thoroughly wash aircraft after each day of spraying to remove residues of this product accumulated during spraying or from spills. Landing gear is most susceptible.

**AERIAL SPRAY DRIFT MANAGEMENT**

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications or to public health uses.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they should be observed.

**Importance of Droplet Size**

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see the Wind, Temperature and Humidity, and Temperature Inversions sections of this label).

**Controlling Droplet Size**

**Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.

**Pressure:** Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

**Number of nozzles:** Use the minimum number of nozzles that provide uniform coverage.

**Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the air stream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.

**Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.

**Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

Application height: Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

**Swath Adjustment**

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller droplets, etc.).

**Wind**

Drift potential is lowest between wind speeds of 2 to 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

**Temperature and Humidity**

Set up equipment to produce larger droplets when making applications in low relative humidity to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

**Temperature Inversions**

Applications must not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

**Sensitive Areas**

This product must only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

# 7.2 Ground Broadcast Equipment

For broadcast ground applications, unless otherwise specified in this label or in separate supplemental labeling or Fact Sheets published by Monsanto, use this product at the rate of 1.5 to 3 pints per acre for annual weeds, 3 to 7.5 pints per acre for perennial weeds and 3 to 7.5 pints per acre for woody brush and trees. When used according to label directions this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the **WEEDS CONTROLLED** section of this label.

Use the labeled rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified in this label or in separate supplemental labeling or Fact Sheets published by Monsanto. As weed density increases, the spray volume should be increased toward the upper end of the specified range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat-fan nozzles. Check spray pattern for even distribution of spray droplets.

# 7.3 Hand-Held Equipment

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. Use coarse sprays only.

For control of weeds listed in the **Annual Weeds** section of **WEEDS CONTROLLED**, apply a 0.5-percent solution of this product to weeds less than 6 inches in height or runner length. For annual weeds over 6 inches tall, or unless otherwise specified, use a 1-percent solution. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds.

For best results, use a 1.5-percent solution on harder-to-control perennials, woody vines, brush and trees. Make applications to perennials after seedhead emergence in grasses or bud formation in broadleaf weeds, woody brush and trees for best results.

For low-volume directed spray applications, use a 4- to 8-percent solution of this product for control or partial control of annual weeds, perennial weeds, or woody brush and trees. Spray coverage should be uniform with at least 50 to 75 percent of the foliage contacted. Coverage of the top one half of the plant is important for best results. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zig-zag motion. For flat-fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop.

Unless otherwise specified, use the rates listed in the following table for various methods of foliar application using high-volume, backpack, knapsack and similar types of hand-held equipment. When used according to label directions this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the **WEEDS CONTROLLED** section of this label.

**APPLICATION RATES**

| APPLICATION | | SPRAY VOLUME Gallons/Acre |
|---|---|---|
| SPRAY-TO-WET | | |
| Handgun or Backpack | 0.5 to 1.5% by volume | spray-to-wet* |
| **LOW-VOLUME DIRECTED SPRAY** | | |
| Backpack | 4 to 8% by volume | 15 to 25** |
| Modified High-volume | 1.5 to 3% by volume | 40 to 60** |

* For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff.

**Low-volume directed applications with backpacks work best when treating weeds and brush less than 10 feet tall. For taller weeds and brush, high-volume handguns can be modified by reducing nozzle size and spray pressure to produce a low-volume directed spray.

## 7.4 Selective Equipment

This product can be applied through recirculating spray systems, shielded applicators, hooded sprayers, wiper applicators or sponge bars, after dilution and thorough mixing with water, to listed weeds growing in any aquatic or non-agricultural crop site specified on this label.

A recirculating spray system directs the spray solution onto weeds growing above desirable vegetation, while spray solution not intercepted by weeds is collected and returned to the spray tank for reuse.

AVOID CONTACT OF THIS HERBICIDE WITH DESIRABLE VEGETATION, AS SERIOUS INJURY OR DEATH TO DESIRABLE VEGETATION IS LIKELY TO OCCUR.

Applicators used above desired vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam or splatter of the herbicide solution settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

**Shielded and Hooded Applicators**

A shielded or hooded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. USE EXTREME CARE TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.

**Wiper Applicators and Sponge Bars**

Wiper applicators are devices that physically wipe this product directly onto the weed.

Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 miles per hour. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if 2 applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that, on sloping ground, the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from the use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Nonionic surfactant at a rate of 10 percent by volume of total herbicide solution is recommended with all wiper applications.

**For Rope or Sponge Wick Applicators**—Solutions ranging from 33 to 75 percent of this product in water may be used.

**For Panel Applicators**—Solutions ranging from 33 to 100 percent of this product in water may be used in panel wiper applicators.

## 7.5 Injection Systems

This product can be used in aerial or ground injection spray systems. It may be used as a liquid concentrate or diluted prior to injecting into the spray stream. Do not mix this product with the undiluted concentrate of other products when using injection systems unless specifically recommended.

## 7.6 CDA Equipment

The rate of this product applied per acre by controlled droplet application (CDA) equipment must not be less than the amount in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 2 to 15 gallons of water per acre.

**For the control of annual weeds with hand-held CDA units** — Apply a 15-percent solution of this product (19.25 oz of product per gallon) at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 miles per hour (1 quart per acre). For the control of perennial weeds, apply a 15- to 30-percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 mile per hour (2 to 4 quarts per acre).

CDA equipment produces a spray pattern that is not easily visible. Extreme care must be exercised to avoid spray or drift contacting the foliage or any other tissue of desirable vegetation, as damage or destruction is likely to result.

# 8.0 SITE AND USE INSTRUCTIONS

This product can be used to control weeds, woody brush and trees in aquatic sites, non-agricultural crop sites and crop sites listed on this label.

Non-agricultural crop sites include airports, apartment complexes, commercial sites, ditch banks, dry ditches, dry canals, fence rows, forestry sites, golf courses, habitat restoration and management areas, industrial sites, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, public areas, parks, parking areas, pastures, petroleum tank farms and pumping installations, railroads, rangeland, recreational areas, residential areas, roadsides, schools, storage areas, substations, utility rights-of-way, utility sites, warehouse areas, and wildlife management areas.

Crop sites include citrus, sugarcane, turf, sod and vegetable fallow.

Unless otherwise specified on this label or in separate supplemental labeling or Fact Sheets published by Monsanto, applications may be made to control any weeds listed in the **Annual Weeds, Perennial Weeds** and **Woody Brush And Trees** rate tables. Refer also to the **Selective Equipment** section.

## 8.1 Aquatic Sites

This product can be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, non-flowing or transient. This includes lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas.

If aquatic sites are present in the area and are part of the intended treatment, read and observe the following directions:

**This product does not control plants which are completely submerged or have a majority of their foliage under water.**

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

Consult your local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

**NOTE:** Do not apply this product **directly to water** within 0.5 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 0.5 mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within 0.5 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications. This restriction does **NOT** apply to intermittent inadvertent overspray of water in terrestrial use sites.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after drawdown to ensure application to actively growing weeds.

Floating mats of vegetation may require retreatment. Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not retreat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7.5 pints per acre must not be exceeded in any single broadcast application that is being made over water except as follows, where any labeled rate may be applied:

- Stream crossings in utility rights-of-way.
- Where applications will result in less than 20 percent of the total water area being treated.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

**For Control of Cordgrass (*Spartina spp.*)**

The presence of debris and silt on the surface of cordgrass plants will reduce product performance. It may be necessary to wash targeted plants prior to application to improve herbicide uptake. Where cordgrass has been cut or mowed prior to application, allow significant regrowth before application to ensure adequate interception and uptake of the herbicide solution. Rainfall within 2 hours or immersion within 4 hours after application may reduce effectiveness.

Prior to application, survey the areas to be treated to determine if shellfish beds exist within the intended treatment area. Wait either until shellfish have been harvested before application is made or do not harvest shellfish for 14 days following treatment.

Add 1 to 2 quarts or more of nonionic surfactant or other adjuvant approved for use on aquatic sites and compatible with this product per 100 gallons of spray solution for broadcast applications (ground or air) and when using optical sensing application equipment.

Do not apply this product through any type of irrigation system.

**APPLICATION**

Under ideal application conditions, that is, where silt and debris are not present on plant surfaces, good spray coverage is achievable, target plants are actively growing and labeled rates and application volumes are used, allow at least 4 hours drying time before plants are covered by tidewater. Where one or more of these conditions are not met, schedule applications to allow at lest 5 hours drying time before plants are covered by tidewater. Do not apply when wind speed at the application site exceed 10 miles per hour.

Broadcast Application (Ground): Apply 2 to 8 quarts of this herbicide in 5 to 100 gallons of spray solution per acre. For best results, complete coverage of cordgrass clumps is required.

Broadcast Application (Ground/Optical Sensing Application Equipment): Apply 2 to 8 quarts of this product in 5 to 100 gallons of spray solution per acre using equipment designed and calibrated to deliver spray solution only when cordgrass plants are present and detected by optical sensors. For best results, complete coverage of cordgrass clumps is required.

Hand-Held Backpack or High-volume Equipment: Apply a 5 to 8 percent solution of this product. Ensure that complete coverage of cordgrass clumps is achieved. Do not spray to the point of runoff.

Broadcast Application (Air): Apply 2 to 8 quarts of this product in 5 to 10 gallons of spray solution per acre. Maintain at least a 50-foot buffer between commercial shellfish beds and treated areas. The potential for spray drift is dependent upon weather- and equipment-related factors. The applicator must be familiar with local wind patterns and monitor and record temperature and wind speed prior to and periodically during application. Schedule application in order to allow at least 5 hours before treated plants are covered by tidewater.

**For Foliar and Broadcast Treatment of Japanese Knotweed**

For control of Japanese knotweed (*Polygonum cuspidatum*), this product may be applied as a 2.0% v/v spray-to-wet solution with 0.5 to 2.0% v/v of a nonionic surfactant containing at least 70 percent active ingredient. Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.

For broadcast applications, apply 3 quarts of this product with an aquatic approved surfactant system containing 0.1% v/v nonionic organosilicone and 0.25% v/v nonionic spreader sticker surfactant in 3 to 40 gallons per acre as a broadcast treatment.

Allow at least 3 days after application before disturbing treated vegetation. This product does not control plants which are completely submerged or have a majority of their foliage under water.

**For Foliar and Broadcast Treatment of Oriental Bittersweet**

For control of Oriental bittersweet (*Celastrus orbiculatus*), this product may be applied as a 2.0% v/v spray-to-wet solution with 0.5 to 2.0% v/v of a nonionic surfactant containing at least 70 percent active ingredient. Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.

For broadcast application, apply 2.25 quarts of this product with an aquatic approved surfactant system containing 0.1% v/v nonionic organosilicone and 0.25% v/v nonionic spreader sticker surfactant in 3 to 40 gallons per acre as a broadcast treatment.

Allow at least 3 days after application before disturbing treated vegetation. This product does not control plants which are completely submerged or have a majority of their foliage under water.

**Tank Mixtures**

Tank mixtures of this product plus 2,4-D amine may be used to increase the spectrum of vegetation controlled in aquatic sites. Use 1.5 to 2 pints of this product plus 1 to 2 quarts of 2,4-D amine (4 pounds active ingredient per gallon, labeled for aquatic sites) for control of annual weeds. Use 3 to 7.5 pints of this product plus 2 to 4 quarts of 2,4-D amine (4 pounds active ingredient per gallon, labeled for aquatic sites) for control or partial control of perennial weeds, woody brush and trees.

When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Mix in the following sequence: Fill sprayer tank one-half full with water, add Roundup Custom for Aquatic and Terrestrial Use, then 2,4-D amine and finally surfactant. Fill sprayer tank to final volume of water.

**NOTE:** DO NOT MIX ROUNDUP CUSTOM FOR AQUATIC AND TERRESTRIAL USE AND 2,4-D AMINE CONCENTRATES WITHOUT WATER CARRIER. DO NOT MIX ROUNDUP CUSTOM FOR AQUATIC AND TERRESTRIAL USE AND 2,4-D AMINE IN BYPASS INJECTOR-TYPE SPRAY EQUIPMENT.

## 8.2 Cut Stump

Cut stump treatments may be made on any site listed on this label. This product will control many types of woody brush and tree species. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50- to 100-percent solution of this product to the freshly-cut surface **immediately after** cutting. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

For control of *Ailanthus altissima* (Tree-of-heaven) make a cut stump treatment according to the directions in this section using a spray mixture of 50% Roundup Custom for Aquatic and Terrestrial Use and 10% Arsenal.

DO NOT MAKE CUT STUMP APPLICATIONS WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP. Some sprouts, stems, or trees may share the same root system. Adjacent trees having a similar age, height and spacing may signal shared roots. Whether grafted or shared, injury is likely to occur to non-treated stems/trees when one or more trees sharing common roots are treated.

## 8.3 Conifer and Herbaceous Release Sites

This product can be used for conifer release as a broadcast spray for control, partial control or suppression of herbaceous weeds and hardwoods listed in the **WEEDS CONTROLLED** section of this label. Use only where conifers have been established for more than one year unless otherwise stated below. This product can be applied as a directed spray or by using selective equipment in forestry hardwood and conifer sites, including Christmas tree plantations and silvicultural nurseries.

Use a nonionic surfactant that is labeled for use in over-the-top conifer release applications. Refer to the surfactant manufacturer's label for surfactant use rates and other precautionary statements. Use of this product without a surfactant will result in reduced herbicide performance.

**APPLICATION MUST BE MADE AFTER FORMATION OF FINAL CONIFER RESTING BUDS IN THE FALL OR PRIOR TO INITIAL BUD SWELLING IN THE SPRING.**

Injury may occur to conifers treated for release, especially where spray patterns overlap or the higher rates are applied. Damage can be accentuated if applications are made when conifers are actively growing, or are under stress from drought, flood water, improper planting, insects, animal damage or diseases.

**For release of the following conifer species <u>outside</u> the Southeastern United States:**

**Douglas fir, Fir, Hemlock, Pines*, California Redwood, Spruce**

*Includes all species except loblolly pine, longleaf pine, shortleaf pine or slash pine.

Use 1.5 to 3 pints of this product per acre as a broadcast spray.

To release Douglas fir, and pine and spruce species at the end of the first growing season (except in California), this product can be used at the lower labeled rates of 1.5 to 2.5 pints per acre. Ensure that the conifers are well hardened off before application. Make sure that the nonionic surfactant has been adequately tested for safety to Douglas fir before use.

For release of Spruce (*Picea spp.*) in Maine, Michigan, Minnesota, New Hampshire and Wisconsin, up to 4.5 pints per acre of this product may be used for the control of difficult woody brush and tree species and application must be made after formation of final conifer resting buds in the fall.

Use of a surfactant is not recommended for release of hemlock species or California redwood. In mix conifer stands injury to these species may result if a surfactant is used.

**For release of the following conifer species in the Southeastern United States:**

**Loblolly pine, Slash pine, Eastern white pine, Virginia pine, Shortleaf pine, Longleaf pine**

Apply 2.25 to 3.75 pints of this product per acre as a broadcast spray during late summer or early fall after the pines have hardened off.

For applications made at the end of the first growing season, use 1.5 pints per acre of this product.

TANK MIXTURES: This product can be tank-mixed with the following products for conifer or herbaceous release. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements and label uses for each product in the mixture.

When applied as directed, this product plus listed residual herbicides provides postemergence control of the annual weeds and control or suppression of the perennial weeds listed in this label, and residual control of the weeds listed in the residual herbicide label. Use only on conifer species that are labeled for over-the top sprays for both products.

atrazine
Arsenal Applicator Concentrate
Oust XP

**Late Summer and Fall after Resting Bud Formation**

For release of jack pine, white pine and white spruce, apply 1.5 to 3 pints of this product plus 1 to 3 ounces of Oust XP per acre. For white pine tank mix a maximum of 1 to 1.5 ounces of Oust XP per acre.

For conifer release of Douglas fir, use 1.5 to 2.25 pints of this product plus 2 to 6 ounces of Arsenal Applicator Concentrate per acre. For conifer release of balsam fir and red spruce, apply 3 pints of this product plus 1 to 2.5 ounces of Arsenal Applicator Concentrate per acre.

**Herbaceous Release**

For spring and early summer herbaceous release of loblolly pine, Virginia and longleaf pine apply 12 to 18 fluid ounces of this product with 2 to 4 ounces of Oust XP.

For early spring release of Douglas fir, prior to bud swell, apply 1.5 pints of this product plus 4 pounds active ingredient of atrazine per acre. Allow one full growing season before application. Do not add surfactant to this treatment.

## 8.4 Forestry Site Preparation

Use this product for the control or partial control of woody brush, trees and herbaceous weeds in forestry or for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

This product can also be used in site preparation prior to planting any tree species, including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites.

For applications using different types of equipment, see **APPLICATION RATES** table in the **HAND-HELD EQUIPMENT** section of this label.

TANK MIXTURES: Tank mixtures of this product can be used to increase the spectrum of vegetation controlled in forestry site preparation. When tank mixing, read and carefully

observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture.

**NOTE:** For forestry site preparation, make sure the tank-mix product is approved for use prior to planting the desired species. Observe planting interval restrictions.

Any labeled rate of this product can be used in a tank mix with the following products for forestry site preparation.

| | |
|---|---|
| Arsenal Applicators Concentrate | Garlon 3A |
| Chopper | Garlon 4 |
| Chopper GEN2 | Oust XP |
| Escort | |

For control of herbaceous weeds, use the lower specified tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher labeled rates.

**Unless otherwise directed on this label or in separately published Monsanto supplemental labeling or Fact Sheet, do not apply this product as an over-the-top broadcast spray for forestry conifer or hardwood release.**

## 8.5 Non-Crop Areas and Industrial Sites

Use in areas including airports, apartment complexes, commercial sites, ditch banks, dry ditches, dry canals, fencerows, forestry sites, golf courses, industrial sites, lumber yards, manufacturing sites, office complexes, parks, parking areas, petroleum tank farms and pumping installations, railroads, recreational areas, residential areas, roadsides, sod or turf seed farms, schools, storage areas, substations, utility sties, warehouse areas, and wildlife management areas.

**Weed Control, Trim-and-Edge and Bare Ground**

This product can be used in non-agricultural crop areas. It can be applied with any application equipment described in this label. This product can be used to trim-and-edge around objects for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product can be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

Repeat applications of this product as weeds emerge to maintain bare ground.

TANK MIXTURES: This product can be tank-mixed with the following products.

| | | |
|---|---|---|
| Arsenal | Garlon 3A | Ronstar 50WP |
| atrazine* | Garlon 4 | simazine* |
| Barricade 65WG | Goal 2XL | Surflan AS |
| Certainty | Krovar I DF | Surflan WDG |
| Crossbow L | Landmark II | Telar DF |
| dicamba* | Landmark II MP | Transline |
| diuron* | Outrider | Velpar DF |
| Endurance | Oust XP | Velpar L |
| Escort XP | Plateau | 2,4-D* |
| Gallery 75DF | Poast | |

*User is responsible for ensuring that tank mixtures with products containing this generic active ingredient may be made provided the specific product is registered for this use.

Do not apply dicamba tank mixtures by air in California. Only 2,4-D amine formulations can be applied by air in California.

**Brush Control Tank Mixtures**

TANK MIXTURES: Tank mixtures of this product can be used to increase the spectrum of control for herbaceous weeds, woody brush and trees. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Any labeled rate of this product can be used in a tank mix.

For control of herbaceous weeds, use the lower tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher labeled rates.

**NOTE:** For side trimming treatments, this product can be used alone or in tank mixture with Garlon 4.

| | |
|---|---|
| Arsenal | Garlon 3A |
| Escort XP | Garlon 4 |

**Chemical mowing - Perennials**

This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Use 6 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass, quackgrass or reed canarygrass covers. Use 5 fluid ounces of this product per acre when treating Kentucky bluegrass. Apply treatments in 10 to 40 gallons of spray solution per acre. Apply after grasses have greened up to at least 75 percent green color in the spring, or 7 to 10 days after mowing when sufficient regrowth has occurred to provide a desirable height for growth regulation.

Use only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

**Chemical mowing - Annuals**

For growth suppression of some annual grasses, such as annual ryegrass, wild barley and wild oats growing in coarse turf on roadsides or other industrial areas, apply 3 to 4 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Applications should be made when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments may cause injury to the desired grasses.

**Dormant Turfgrass**

Use this product to control or suppress many winter annual weeds and tall fescue for effective release of dormant bermudagrass and bahiagrass turf. Treat only when turf is dormant and prior to spring greenup.

Apply 6 to 48 fluid ounces of this product per acre. Apply the labeled rates in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated.

Treatments in excess of 12 fluid ounces per acre may result in injury or delayed greenup in highly maintained areas, such as golf courses and lawns. DO NOT apply tank mixtures of this product plus Oust XP or Outrider in highly maintained turfgrass areas. For further uses, refer to the **ROADSIDES** section of this label, which gives rates for dormant bermudagrass and bahiagrass treatments.

**Actively Growing Bermudagrass**

This product can be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. DO NOT apply more than 12 fluid ounces of this product per acre in highly maintained turfgrass areas. DO NOT apply tank mixtures of this product plus Oust XP or Outrider in highly maintained turfgrass areas. For further uses, refer to the **ROADSIDES** section of this label, which gives rates for actively growing bermudagrass treatments. Use only in areas where some temporary injury or discoloration can be tolerated.

**Turfgrass Renovation, Seed, or Sod Production**

This product controls most existing vegetation prior to renovating turfgrass areas or establishing turfgrass grown for seed or sod. For maximum control of existing vegetation, delay planting or sodding to determine if any regrowth from escaped underground plant parts occurs. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses such as bermudagrass, summer or fall applications provide the best control. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray.

Do not disturb soil or underground plant parts before treatment. Tillage or renovation techniques such as vertical mowing, coring or slicing should be delayed for 7 days after application to allow translocation into underground plant parts.

Desirable turfgrasses can be planted following the above procedures.

Hand-held equipment can be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment can be used to control sod remnants or other unwanted vegetation after sod is harvested.

Do not feed or graze turfgrass grown for seed or sod production for 8 weeks following application.

## 8.6 Habitat Management

**Habitat Restoration and Management**

Use this product to control exotic and other undesirable vegetation in habitat management and natural areas, including riparian and estuarine areas, rangeland and wildlife refuges. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broad-spectrum vegetation control requirements. Spot treatments can be made to selectively remove unwanted plants for habitat management and enhancement.

**Wildlife Food Plots**

Use this product as a site preparation treatment prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage to allow translocation into underground plant parts.

## 8.7 Hollow Stem Injection

Apply this product through hand-held injection devices that deliver specified amounts of this product into targeted hollow-stem plants growing in any aquatic or non-crop site specified on this label. For control of the following hollow-stem plants, follow the use instructions below:

**Castorbean** (*Ricinus communis*)
Inject 4 mL/plant of this product into the lower portion of the main stem.

**Hemlock, Poison** (*Conium maculatum*)
Inject one leaf cane per plant 10 to 12 inches above root crown with 5 mL of a 5% v/v solution of this product.

**Hogweed, Giant** (*Heracleum mantegazzianum*)
Inject one leaf cane per plant 12 inches above root crown with 5 mL of a 5% v/v solution of this product.

**Horsetail, Field** (*Equisetum arvense*)
Inject one segment above the root crown with 0.5 mL/stem of this product. Use a small syringe that calibrates to this rate.

**Iris, Yellow Flag** (*Iris Pseudocorus*)

Cut flower stems with clippers 8 to 9 inches above the root crown. Use a cavity needle that is pushed into the stem center and then slowly removed as 0.5 mL/stem of this product is injected into the stem.

**Knotweed, Bohemian** (*Polygonum bohemicum*), **Knotweed, Giant** (*Polygonum sachalinense*), and **Knotweed, Japanese** (*Polygonum cuspidatum*)
Inject 5 mL/stem of this product into the second or third internode.

**Reed, Common** (*Phragmites australis*)
Inject 5 mL per stem of a 50% solution of this product into the second or third internode or into freshly cut stems.

**Reed, Giant** (*Arundo donax*)
Inject 6 mL/stem of this product into the second or third internode.

**Thistle, Canada** (*Cirsium arvense*)
Cut 8 to 9 of the tallest plants at bud stage in a clump with clippers. Use a cavity needle that is pushed into the stem center and then slowly removed as 0.5 mL/stem of this product is injected into the stem.

**NOTE:** Based on the maximum annual use rate of glyphosate for these non-crop sites, the combined total for all treatments must not exceed 8 quarts of this product per acre. At 5 mL per stem, 8 quarts should treat approximately 1500 stems.

## 8.8 Injection and Frill (Woody Brush and Trees)

This product can be used to control woody brush and trees by injection or frill applications. Apply using suitable equipment that must penetrate into the living tissue. Apply the equivalent of 1 mL of this product per each 2 to 3 inches of trunk diameter at breast height (DBH). This is best achieved by applying a 50- to 100-percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make the frill or cuts at an oblique angle to produce a cupping effect and use a 100-percent (undiluted) concentration of this product. For best results, application should be made during periods of active growth and after full leaf expansion.

## 8.9 Ornamentals, Plant Nurseries, and Christmas Trees

**Post-directed, Trim-and-edge**

This product can be used as a post-directed spray around established woody ornamental species such as arborvitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce and yew. This product can also be used to trim and edge around trees, buildings, sidewalks and roads, potted plants and other objects in a nursery setting.

Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material. THIS PRODUCT IS NOT TO BE USED AS AN OVER-THE-TOP BROADCAST SPRAY IN ORNAMENTALS AND CHRISTMAS TREES. Care must be exercised to avoid contact of spray, drift or mist with foliage or bark of established ornamental species.

**Site Preparation**

This product can be used prior to planting any ornamental, nursery or Christmas tree species.

**Wiper Applications**

This product can be used through wick or other suitable wiper applicators to control or partially control undesirable vegetation around established eucalyptus or poplar trees. See the **Selective Equipment** section of this label for further information about the proper use of wiper applicators.

**Greenhouse/Shadehouse**

This product can be used to control weeds growing in and around greenhouses and shadehouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

## 8.10 Parks, Recreational and Residential Areas

All of the instructions in the **Non- Crop Areas and Industrial Sites** section apply to park and recreational areas.

This product can be used in parks, recreational and residential areas. It may be applied with any application equipment described in this label to trim-and-edge around trees, fences, and paths, around buildings, sidewalks, and other objects in these areas. This product can be used for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product can be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

## 8.11 Railroads

All of the instructions in the **Non-crop Areas and Industrial Sites** section apply to railroads.

**Bare ground, Ballast and Shoulders, Crossings, and Spot Treatment**

This product can be used to maintain bare ground on railroad ballast and shoulders. Repeat applications can be made as weeds emerge to maintain bare ground. This product can be used to control tall-growing weeds to improve line-of-sight at railroad crossings and reduce the need for mowing along rights-of-way. For crossing applications, up to 80 gallons of spray solution per acre may be used.

TANK MIXTURES: This product can be tank-mixed with the following products for ballast, shoulder, spot, bare ground and crossing treatments provided that the specific product is registered for use on such sites.

| | | |
|---|---|---|
| Arsenal | Hyvar X-L | Spike 80DF |
| atrazine* | Krovar I DF | Telar DF |
| dicamba* | Oust XP | Transline |
| Escort XP | Outrider | Velpar DF |
| Garlon 3A | Sahara DG | Velpar L |
| Garlon 4 | simazine* | 2,4-D* |
| Hyvar X | | |

*Tank mixtures with products containing this active ingredient can be made provided the specific product is registered for this use. User is responsible for ensuring that the mixture product labels allow the specific applications when tank mixing with a generic active ingredient.

**Brush Control**

This product can be used to control woody brush and trees on railroad rights-of-way. Apply 3 to 8 quarts of this product per acre as a broadcast spray, using boom-type or boomless nozzles. Up to 80 gallons of spray solution per acre may be used. Apply a 0.75- to 1.5-percent solution of this product when using high-volume spray-to-wet applications. Apply a 4- to 8-percent solution of this product when using low-volume directed sprays for spot treatment.

TANK MIXTURES: This product can be mixed with the following products for enhanced control of woody brush and trees provided that the specific product is registered for use on such sites.

| | | |
|---|---|---|
| Arsenal | Krenite | Transline |
| Escort XP | Telar DF | Vanquish |
| Garlon 3A | Tordon K | Velpar DF |
| Garlon 4 | Tordon 22K | Velpar L |

Additional instructions are located in the **Non-Crop Areas and Industrial Sites** section under **Brush Control Tank Mixtures**.

**Bermudagrass Release**

This product can be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 12 to 36 fluid ounces of this product in up to 80 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

| | | |
|---|---|---|
| Bahiagrass | Fescue, tall | Trumpetcreeper |
| Bluestem, silver | Johnsongrass | Vaseygrass |

TANK MIXTURES: This product can be tank-mixed with Oust XP. If tank-mixed, use no more than 12 to 36 fluid ounces of this product with 1 to 2 ounces of Oust XP per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust XP label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

| | | |
|---|---|---|
| Bahiagrass | Dock, curly | Trumpetcreeper |
| Blackberry | Dogfennel | Vaseygrass |
| Bluestem, silver | Fescue, tall | Vervain, blue |
| Broomsedge | Johnsongrass | |
| Dallisgrass | Poorjoe | |
| Dewberry | Raspberry | |

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Do not make repeat applications in the same season since severe injury may occur.

## 8.12 Roadsides

All of the instructions in the **Non-Crop Areas and Industrial Sites** section apply to roadsides.

**Shoulder Treatments**

Use this product on road shoulders and applied with boom sprayers, shielded boom sprayers, high-volume off-center nozzles, hand-held equipment, and similar equipment.

**Guardrails and Other Obstacles to Mowing**

This product can be used to control weeds growing under guardrails and around signposts and other objects along the roadside.

**Spot Treatment**

This product can be used as a spot treatment to control unwanted vegetation growing along roadsides.

TANK MIXTURES: This product can be tank-mixed with the following products for shoulder, guardrail, spot and bare ground treatments, provided that the specific tank mixture product is registered for use on such sites. Refer to these product labels and observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture.

| | | |
|---|---|---|
| atrazine* | Landmark MP | Sahara DG |
| Crossbow L | Landmark XP | simazine* |
| dicamba* | Oust XP | Surflan AS |
| diuron* | Outrider | Surflan WDG |
| Escort XP | pendimethalin* | Telar DF |
| Endurance | Plateau | Velpar DF |
| Gallery 75 DF | Plateau DG | Velpar L |
| Krovar I DF | Poast | 2,4-D* |
| Landmark II MP | Ronstar 50 WSP | |

* Tank mixtures with products containing this generic active ingredient can be made provided the specific product is registered for this use. User is responsible for ensuring the mixture product allows the specific application.

**Release of Bermudagrass or Bahiagrass**

**Dormant Applications**

This product can be used to control or partially control many winter annual weeds and tall fescue for effective release of dormant bermudagrass or bahiagrass. Treat only when turf is dormant and prior to spring greenup. This product can also be tank-mixed with Outrider or Oust XP for residual control. Tank mixtures of this product with Oust XP may delay greenup.

For best results on winter annuals, treat when plants are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is at or beyond the 4- to 6-leaf stage.

Apply 6 to 48 ounces of this product in a tank mixture with 0.75 to 1.33 ounces Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

TANK MIXTURES: Apply 6 to 48 fluid ounces of this product per acre alone or in a tank mixture with 0.25 to 1 ounce per acre of Oust XP. Apply the labeled rates in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated. To avoid delays in greenup and minimize injury, add no more than 1 ounce of Oust XP per acre on bermudagrass and no more than 0.5 ounce of Oust XP per acre on bahiagrass and avoid treatments when these grasses are in a semi-dormant condition.

**Actively Growing Bermudagrass**

This product can be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 12 to 36 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

| | | |
|---|---|---|
| Bahiagrass | Fescue, tall | Trumpetcreeper |
| Bluestem, silver | Johnsongrass | Vaseygrass |

TANK MIXTURES: This product can be tank-mixed with Outrider for control or partial control of Johnsongrass and other weeds listed in the Outrider label. Use 6 to 24 ounces of this product with 0.75 to 1.33 ounces of Outrider. Use the higher rates of both products for control of perennial weeds or annual weeds greater than 6 inches in height.

This product can be tank-mixed with Oust XP. If tank-mixed, use no more than 12 to 24 fluid ounces of this product with 1 to 2 ounces of Oust XP per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust XP label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

| | | |
|---|---|---|
| Bahiagrass | Dock, curly | Poorjoe |
| Bluestem, silver | Dogfennel | Trumpetcreeper |
| Broomsedge | Fescue, tall | Vaseygrass |
| Dallisgrass | Johnsongrass | Vervain, blue |

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Do not make repeat applications of the tank mix in the same season since severe injury may occur.

**Actively Growing Bahiagrass**

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4 fluid ounces of this product in 10 to 40 gallons of water per acre. Apply 1 to 2 weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 3 fluid ounces of this product per acre, followed by an application of 2 to 3 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

This product can be used for control or partial control of Johnsongrass and other weeds listed on the Outrider label in actively growing bahiagrass. Apply 1.5 to 3.5 fluid ounces of this product with 0.75 to 1.33 ounces of Outrider per acre. Use the higher rates for control of perennial weeds or annual weeds greater than 6 inches in height. Use only on well established bahiagrass.

A tank mixture of this product plus Oust XP may be used. Apply 4 fluid ounces of this product plus 1/4 ounce of Oust XP per acre 1 to 2 weeks following an initial spring mowing. Make only one application per year.

## 8.13 Utility Sites

In utilities, use this product along electrical power, pipeline and telephone rights-of-way, and in other sites associated with these rights-of-way, such as substations, roadsides, railroads or similar rights-of-way that run in conjunction with utilities. Use in preparing or establishing wildlife openings within these sites, maintaining access roads and for side trimming along utility rights-of-way.

TANK MIXTURES: Tank mixtures of this product can be used to increase the spectrum of control for herbaceous weeds, woody brush and trees. Any labeled rate of this product can be used in a tank mix.

For control of herbaceous weeds, use the lower tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher rates.

**NOTE:** For side trimming treatments, this product may be used alone or in tank mixture with Garlon 4.

| | | |
|---|---|---|
| Arsenal | Krenite | Surflan AS |
| atrazine* | Krovar I DF | Surflan WDG |
| dicamba* | Oust XP | Telar DF |
| diuron* | Outrider | Transline |
| Endurance | pendimethalin* | Vanquish |
| Escort XP | Plateau | Velpar DF |
| Garlon 3A** | Sahara DG | Velpar L |
| Garlon 4 | simazine* | 2,4-D* |

* Tank mixtures with products containing this generic active ingredient can be made provided the specific product is registered for this use. User is responsible for ensuring the mixture product allows the specific application.

** Ensure that Garlon 3A is thoroughly mixed with water according to label directions before adding this product. Have spray mixture agitating at the time this product is added to avoid spray compatibility problems.

**Bare Ground and Trim-and-Edge**

Use this product in and around utility sites and substations for bare ground, trim-and-edge around objects, spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product can be used prior to planting a utility site to ornamentals, flowers, turfgrass (sod or seed), or beginning construction projects.

Repeat applications of this product as weeds emerge to maintain bare ground.

TANK MIXTURES: Tank mix with the following products. Refer to the specific product labels for approved sites and application rates. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture.

| | | |
|---|---|---|
| Arsenal | Garlon 3A | Poast |
| atrazine* | Garlon 4 | Ronstar 50WP |
| Barricade 65WG | Goal 2XL | simazine* |
| Certainty | Krovar I DF | Surflan AS |
| Crossbow L | Landmark II MP | Surflan WDG |
| dicamba * | Landmark II | Telar DF |
| diuron* | Outrider | Transline |
| Endurance | Oust XP | Velpar DF |
| Escort XP | pendimethalin* | Velpar L |
| Gallery 75DF | Plateau | 2,4-D* |

*Tank mixtures with products containing this generic active ingredient may be made provided the specific product is registered for this use. User is responsible for ensuring the mixture product label allows the specific application.

# 9.0 PASTURE AND RANGELANDS

## 9.1 Pastures

LABELED GRASSES: Bahiagrass, Bermudagrass, Bluegrass, Brome, Fescue, Guineagrass, Kikuyugrass, Orchardgrass, Pangola grass, Ryegrass, Timothy, Wheatgrass.

**Preplant, Preemergence, Pasture Renovation**

This product can be applied prior to planting or emergence of forage grasses. In addition, this product can be used to control perennial pasture species listed on this label prior to re-planting.

If application rates total 4.5 pints per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 4.5 pints per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

**Spot Treatment, Over-the-Top Wiper Applications**

This product can be applied as a spot treatment or with wiper applicators in pastures. Applications may be made in the same area at 30-day intervals.

For spot treatments or wiper application methods using rates of 4.5 pints per acre or less, the entire field or any portion of it may be treated. When spot treatments or wiper application are made using rates above 4.5 pints per acre, no more than 10 percent of the total pasture may be treated at any one time. To achieve maximum performance, remove domestic livestock before application and wait 7 days after application before grazing livestock or harvesting.

**Postemergent Weed Control (Broadcast Treatments)**

This product can be used to suppress competitive growth and seed production of annual weeds and undesirable vegetation in pastures. For selective applications with broadcast spray equipment, apply 9 to 12 fluid ounces of this product per acre in early spring before desirable perennial grasses break dormancy and initiate green growth. Late fall applications can be made after desirable perennial grasses have reached dormancy.

Some stunting of perennial grasses will occur if broadcast applications are made when plants are not dormant. No waiting period is required between application and grazing or harvesting for feed. Use of higher application rates will cause stand reductions. Do not apply more than 4.5 pints per acre per year onto pasture grasses except for renovation uses. If replanting is needed due to severe stand reduction, applications must be made at least 30 days prior to planting any grass not listed for treatment in this label.

## 9.2 Rangelands

Postemergence application of this product will control or suppress many annual weeds growing in perennial cool- and warm-season grass rangelands.

Preventing viable seed production is key to the successful control and invasion of annual grassy weeds in rangelands. Follow-up applications in sequential years should eliminate most of the viable seeds.

Grazing of treated areas should be delayed to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

Apply 9 to 12 fluid ounces of this product per acre to control or suppress many weeds, including downy brome, cheatgrass, cereal rye and jointed goatgrass in rangelands. Apply when most brome plants are in early flower and before the plants, including seedheads, turn color. Allowing for secondary weed flushes to occur in the spring following rain events further depletes the seed reserve and encourages perennial grass conversion on weedy sites. Fall applications are possible and recommended, where spring moisture is usually limited and fall germination allows for good weed growth.

For medusahead, apply 12 fluid ounces of this product per acre at the 3-leaf stage. Delaying applications beyond this stage will result in reduced or unacceptable control. Controlled burning may be useful in eliminating the thatch layer produced by slowly decaying culms prior to application. Allow new growth to occur before spraying after a burn. Repeat applications in subsequent years may be necessary to eliminate the seedbank before reestablishing desirable perennial grasses in medusahead-dominated rangelands.

Slight discoloration of the desirable grasses may occur, but they will regreen and regrow under moist soil conditions as effects of this product wear off. Do not use ammonium sulfate when spraying rangeland grasses with this product. No waiting period between treatment and feeding of livestock grazing is required.

# 10.0 CROP USES

## 10.1 Citrus

For use in Florida and Texas on Calamondin, Chironja, Citron, Citrus Hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (all), Pummelo, Satsuma Mandarin, Tangelo (ugli), Tangor.

This product can be applied preplant (site preparation) broadcast spray, middles (between rows of trees, vines or bushes), strips (within rows of trees, vines or bushes), shielded sprayers, wiper applications, directed spray, or as spot treatment.

Applications may be made with boom equipment, CDA equipment, shielded sprayers, hand-held and high-volume wands, lances, orchard guns or with wiper applicator equipment, except as directed.

**The following instructions pertain to Florida and Texas.**

For burndown or control of the weeds listed below, apply the labeled rates of this product in 3 to 30 gallons of water per acre. Where weed foliage is dense, use 10 to 30 gallons of water per acre.

For goatweed, apply 3 to 4.5 pints of this product per acre. Apply in 20 to 30 gallons of water per acre when plants are actively growing. Use 3 pints per acre when plants are less than 8 inches tall and 4.5 pints per acre when plants are greater than 8 inches tall. If goatweed is greater than 8 inches tall, the addition of Krovar I or Karmex may improve control. Refer to the individual product labels for specific crops, rates, geographic restrictions and precautionary statements.

Perennial weeds:

S = Suppression B = Burndown PC = Partial control C = Control

ROUNDUP CUSTOM FOR AQUATIC AND TERRESTRIAL USE RATE PER ACRE

| WEED SPECIES | 1.5 PT | 3 PT | 4.5 PT | 7.5 PT |
|---|---|---|---|---|
| Bermudagrass | B | -- | PC | C |
| Guineagrass | | | | |
| Texas and Florida Ridge | B | C | C | C |
| Florida Flatwoods | -- | B | C | C |
| Paragrass | B | C | C | C |
| Torpedograss | S | -- | PC | C |

Allow a minimum of 1 day between last application and harvest in citrus crops. For citron groves, apply as directed sprays only.

## 10.2 Sugarcane

This product can be applied fallow, preplant, preemergence or at-planting using hooded sprayers, shielded sprayers, or by wiper application in row-middles, as a post-harvest treatment, as a spot treatment or as foliar treatment for plant growth regulation.

**Preplant, Preemergence, At-Planting**

Apply this product in or around sugarcane fields or in fields prior to the emergence of plant cane. Do not apply to vegetation in or around ditches, canals or ponds containing water to be used for irrigation.

**Spot Treatment**

Apply this product as a spot treatment in sugarcane. For control of volunteer or diseased sugarcane, make a 0.75-percent solution of this product in water and spray-to-wet the foliage of vegetation to be controlled. Volunteer or diseased sugarcane should have at least 7 new leaves. Avoid spray contact with healthy cane plants since severe damage or destruction may result. Do not feed or graze treated sugarcane foliage following application.

**Fallow Treatments**

Apply this product as a replacement for tillage in fields that are lying fallow between sugarcane crops. This product can also be used to remove the last stubble of ratoon cane. For removal of last stubble of ratoon cane, apply 6 to 7.5 pints of this product in 10 to 40 gallons of water per acre to new growth having at least 7 new leaves. Allow 7 or more days after application before tillage. Ground or aerial application equipment may be used. Applications up to 4.5 pints per acre may be made by aerial application in fallow sites where there is sufficient buffer to prevent injury due to drift onto adjacent crops. Tank mixtures with 2,4-D and dicamba can be used.

**Hooded Sprayers**

Apply this product through hooded sprayers for weed control between the rows of sugarcane. See the **APPLICATION EQUIPMENT AND TECHNIQUES** section of this label for additional use instructions.

Do not allow treated weeds to come into contact with the crop. Droplets, mist, foam or splatter of the herbicide solution settling on the crop can result in discoloration, stunting or destruction. Such damage shall be the sole responsibility of the applicator.

**Foliar Treatment for Plant Growth Regulation**

Do not plant to subsequent crops other than the following for 30 days after application: Corn (All), Soybean, Sorghum (Milo), Cotton, Alfalfa, Beans (All), Forage Grasses, Potatoes (Irish, Sweet), Wheat.

When applied as directed under the conditions described, this product will hasten ripening and extend the period of high sucrose level in sugarcane. It is effective in both low- and high-tonnage sugarcane. As a result of leaf desiccation, improved trash burn can be expected. Within 2 to 3 weeks after application, this product can produce a slight yellowing to pronounced browning and drying of leaves, and a shortening of upper internodes; spindle death may occur. Most of the sucrose increase is concentrated in the top nodes of the treated cane stalk. In order to recover the maximum sugar where topping is practiced, during harvest, top at the base of the fourth leaf. Prior to application, consult your state sugarcane authority or local Monsanto representative regarding the degree of sucrose response anticipated from the variety of sugarcane to be treated.

See the following for rates and time of application for the State in which applications are to be made. **NOTE:** Use the higher rate within the specified range when treating sugarcane under adverse ripening conditions or when less responsive varieties are to be treated.

**FLORIDA**—Apply 6 to 14 fluid ounces of this product per acre 3 to 5 weeks before harvest of LAST RATOON CANE ONLY.

**HAWAII**—Apply 10 to 24 fluid ounces of this product per acre 4 to 10 weeks before harvest.

**LOUISIANA**—Apply 4 to 14 fluid ounces of this product per acre 3 to 7 weeks before harvest of RATOON CANE ONLY.

**PUERTO RICO**—Apply 6 fluid ounces of this product per acre 3 to 5 weeks before harvest of RATOON CANE ONLY.

**TEXAS**—Apply 6 to 14 fluid ounces of this product per acre 3 to 5 weeks before harvest of RATOON CANE ONLY.

Application of this product can initiate development of shooting eyes. This product can not increase the sucrose content of sugarcane under conditions of good natural ripening. Do not apply to sugarcane to be harvested for seed purposes. Do not feed or graze treated sugarcane forage following application.

## 10.3 Chemical Fallow Treatments

Apply this product during fallow intervals preceding planting, prior to planting or transplanting, at-planting, or preemergent to vegetable crops.

When applying this product prior to transplanting or direct-seeding vegetable crops into plastic mulch, care must be taken to remove residues of this product, which could cause crop injury, from the plastic prior to planting. Residues can be removed by a single 0.5-inch application of water, either by natural rainfall or via a sprinkler system. Ensure that the wash water flushes off the plastic mulch and does not enter the transplant holes. Applications made at emergence will result in injury or death to emerged seedlings.

Avoid contact of herbicide with foliage, shoots or stems, green bark, exposed roots (including those emerging from plastic mulch), or fruit of crops because severe injury or

destruction may result. Post-harvest or fallow applications must be made at least 30 days prior to planting any non-labeled crop.

## 10.4 Sod or Commercial Sod Production

**Preplant, Preemergence, At-Planting, Renovation, Site Preparation**

This product controls most existing vegetation prior to renovating turf or forage grass seed areas or establishing turf grass grown for sod. Make applications before, during, or after planting or for renovation. For maximum control of existing vegetation, delay planting to determine if any regrowth from escaped underground plant parts occurs. Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses, such as Bermudagrass, summer or fall applications provide best control. Broadcast equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

Do not disturb soil or underground plant parts before treatment. Tillage or renovation techniques such as vertical mowing, coring or slicing should be delayed for 7 days after application to allow proper translocation into underground plant parts. If application rates total 72 fluid ounces per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 4.5 pints per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting. For any crop not listed for treatment in this label, applications must be made at least 30 days prior to planting. Applications must be made prior to the emergence of the crop to avoid crop injury.

**Shielded Sprayers**

Apply 1.5 to 4.5 pints of this product in 10 to 20 gallons of water per acre to control weeds between grass seed rows. Uniform planting in straight rows aid in shielded sprayer applications. Best results are obtained when the grass seed crop is small enough to easily pass by the protective shields. For additional instructions, see **Hooded and Shielded Applicators** in the **Selective Equipment** section.

Contact of this product in any manner to any vegetation to which treatment is not intended can cause damage. Such damage shall be the sole responsibility of the applicator.

**Over-the-Top Wiper Applications**

Adjust applicators so that the wiper contact point is at least 2 inches above the desirable vegetation. Weeds should be a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or when height of weeds varies so that not all weeds are contacted. In these instances, repeat treatments may be necessary. For additional instructions, see **Wiper Applicators** in the **Selective Equipment** section.

Contact of the herbicide solution with desirable vegetation can result in damage or destruction.

**Spot Treatment**

Apply this product as a 1-percent solution prior to heading of grasses grown for seed. The crop receiving the spray in the treated area will be killed. Take care to avoid drift or spray outside the target area for the same reason. Use hand-held equipment to control sod remnants or other unwanted vegetation after sod is harvested.

**Creating Rows in Annual Ryegrass**

Use 12 to 24 fluid ounces of this product per acre. Use the higher rate when the ryegrass is greater than 6 inches tall. Best results are obtained when applications are made before the ryegrass reaches 6 inches in height.

Set nozzle heights to allow the establishment of the desired row spacing while preventing spray droplets, spray fines, or drift to contact the ryegrass plants not treated. Use of low-pressure nozzles, or drop nozzles designed to target the application over a narrow band are recommended.

Grower assumes all responsibility for crop losses from misapplication.

# 11.0 USES AROUND THE FARMSTEAD

## 11.1 Weed Control and Trim-And-Edge

This product can be used to control annual weeds, perennial weeds and woody brush which are found in any part of the farmstead, including building foundations, along and in fences, in dry ditches and canals, along ditchbanks, farm roads, shelterbelts, prior to landscape plantings and equipment storage areas.

This product can be tank-mixed with the following products, provided that the specific product is registered for use on such non-agricultural crop sites. Refer to these product labels for approved farmstead sites and application rates. For annual weeds, use 1.5 pints per acre of this product when weeds are less than 6 inches tall, 2.25 pints per acre when weeds are 6 to 12 inches tall and 3 pints per acre when weeds are greater than 12 inches tall. For perennial weeds, apply 3 to 7.5 pints per acre in these tank mixes. For tank mixtures with these products through backpack sprayers, handguns or other high-volume spray-to-wet applications, see the **ANNUAL WEEDS** section for hand-held or high-volume equipment of this label for specific rates.

| | | |
|---|---|---|
| Arsenal | Krovar I DF | Ronstar 50 WP |
| Banvel/Clarity | Oust XP | Sahara |
| Barricade 65WG | Pendulum 3.3 EC | simazine |
| diuron | Pendulum WDG | Surflan |
| Endurance | Plateau | Telar |
| Escort | Princep DF | Vanquish |
| Karmex DF | Princep Liquid | 2,4-D |

This product plus dicamba tank mixtures may not be applied by air in California.

## 11.2 Greenhouse/Shadehouse

This product can be used to control weeds in and around greenhouses and shadehouses. Desirable vegetation must not be present during application and air circulation fans must be turned off.

## 11.3 Chemical Mowing

This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Use 4.5 fluid ounces of this product per acre when treating Kentucky bluegrass. Use 6 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass, bahiagrass or quackgrass covers. Use 12 fluid ounces of this product per acre when treating bermudagrass. Use 48 fluid ounces of this product per acre when treating torpedograss or paragrass. Apply treatments in 10 to 20 gallons of spray solution per acre. Chemical mowing applications may be made along farm ditches and other parts of farmsteads.

Use only in areas where some temporary injury or discoloration of perennial grasses can be tolerated.

# 12.0 WEEDS CONTROLLED

Always use the higher rate of this product per acre within the labeled range when weed growth is heavy or dense or weeds are growing in an undisturbed (non-cultivated) area.

Reduced results can occur when treating weeds heavily covered with dust. For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

Refer to the following label sections for application rates for the control of annual and perennial weeds and woody brush and trees. For difficult to control perennial weeds and woody brush and trees, where plants are growing under stressed conditions, or where infestations are dense, use this product at 4.5 to 8 quarts per acre for enhanced results.

## 12.1 Annual Weeds

Apply to actively growing annual grasses and broadleaf weeds.

Allow at least 3 days after application before disturbing treated vegetation. After this period the weeds may be mowed, tilled or burned. See **DIRECTIONS FOR USE**, **PRODUCT INFORMATION** and **MIXING** and **APPLICATION INSTRUCTIONS** for labeled uses and specific application instructions.

Use 1.5 pints per acre if weeds are less than 6 inches in height or runner length and 1 to 4 quarts per acre if weeds are over 6 inches in height or runner length or when weeds are growing under stressed conditions.

For spray-to-wet applications, apply a 0.5-percent solution of this product to weeds less than 6 inches in height or runner length. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds. For annual weeds over 6 inches tall, or for smaller weeds growing under stressed conditions, use a 0.75- to 1.5-percent solution. Use the higher labeled rate for tough-to-control species or for weeds over 24 inches tall.

**WEED SPECIES**

| | |
|---|---|
| Anoda, spurred | Copperleaf, Virginia |
| Balsamapple** | Coreopsis, plains/tickseed* |
| Barley* | Corn* |
| Barley, little* | Crabgrass* |
| Barnyardgrass* | Cupgrass, woolly* |
| Bassia, fivehook | Dwarfdandelion* |
| Bittercress* | Eclipta* |
| Bluegrass, annual* | Falsedandelion* |
| Bluegrass, bulbous* | Falseflax, smallseed* |
| Brome, downy* | Fiddleneck |
| Brome, Japanese* | Filaree |
| Broomsedge | Fleabane, annual* |
| Buttercup* | Fleabane, hairy *(Conyza bonariensis)** |
| Castorbean | Fleabane, rough* |
| Cheatgrass* | Foxtail* |
| Cheeseweed *(Malva parviflora)* | Foxtail, Carolina* |
| Chervil* | Geranium, Carolina |
| Chickweed* | Goatgrass, jointed* |
| Cocklebur* | Goosegrass |
| Copperleaf, hophornbeam | Groundsel, common* |

| | |
|---|---|
| Henbit | Rocket, London* |
| Horseweed/Marestail *(Conyza canadensis)* | Rocket, Yellow |
| Itchgrass* | Rye* |
| Johnsongrass, seedling | Ryegrass* |
| Junglerice | Sandbur, field* |
| Knotweed | Sesbania, hemp |
| Kochia | Shattercane* |
| Lamb's-quarters* | Shepherd's-purse* |
| Lettuce, prickly* | Sicklepod |
| Mannagrass, eastern* | Signalgrass, broadleaf* |
| Mayweed | Smartweed, ladysthumb* |
| Medusahead* | Smartweed, Pennsylvania* |
| Morningglory *(Ipomoea spp)* | Sorghum, grain (milo)* |
| Mustard, blue* | Sowthistle, annual |
| Mustard, tansy* | Spanishneedles*** |
| Mustard, tumble* | Speedwell, Corn* |
| Mustard, wild* | Speedwell, purslane* |
| Nightshade, black* | Sprangletop* |
| Oats | Spurge, annual |
| Panicum, browntop* | Spurge, prostrate* |
| Panicum, fall* | Spurge, spotted* |
| Panicum, Texas* | Spurry, umbrella* |
| Pennycress, field* | Starthistle, yellow |
| Pepperweed, Virginia* | Stinkgrass* |
| Pigweed* | Sunflower* |
| Puncturevine | Teaweed / Prickly sida |
| Purslane, common | Thistle, Russian |
| Pusley, Florida | Velvetleaf |
| Ragweed, common* | Wheat* |
| Ragweed, giant | Wild oats* |
| Rice, red | Witchgrass* |

* When using field broadcast equipment (aerial applications or boom sprayers using flat-fan nozzles) these species will be controlled or partially controlled using 12 fluid ounces of this product per acre. Applications must be made using 3 to 10 gallons of carrier volume per acre. Use nozzles that ensure thorough coverage of foliage and treat when weeds are in an early growth stage.

** Apply with hand-held equipment only.

*** Apply 3 pints of this product per acre.

## 12.2 Perennial Weeds

Best results are obtained when perennial weeds are treated after they reach the reproductive stage of growth (seedhead initiation in grasses and bud formation in broadleaves). For non-flowering plants, best results are obtained when the plants reach a mature stage of growth. In many situations, treatments are required prior to these growth stages. Under these conditions, use the higher application rate within the labeled range.

- Apply when target plants are actively growing. Do not treat when target plants are under drought stress.
- Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.
- When using hand-held equipment for low-volume directed spot treatments, apply a 4- to 8-percent solution of this product.
- Allow 7 or more days after application before tillage or mowing. If weeds have been mowed or tilled, do not treat until regrowth has reached the specified stages.
- Fall treatments must be applied before a killing frost.
- Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

| Weed Species | Rate (QT/A) | Hand-Held % Solution |
|---|---|---|
| Alfalfa* | 0.7 | 1.5 |
| Alligatorweed* | 3 | 1.3 |
| Apply when most of the target plants are in bloom. Repeat applications will be required to maintain such control. | | |
| Anise (fennel) | 1.5 – 3 | 1 – 1.5 |
| Bahiagrass | 2.3 – 3.75 | 1.5 |
| Beachgrass, European *(Ammophila arenaria)* | – | 3.5 |
| Apply an 8-percent solution of this product plus 0.5- to 1.5-percent nonionic surfactant on a low-volume spray-to-wet basis. Best results are obtained when applications are made when European beachgrass is actively growing through the boot to the full heading stages of growth. Make applications prior to the loss of more than 50% green leaf color in the fall. Repeat applications may be necessary to treat skips. Monitor treated areas prior to reseeding of desirable vegetation. For selective control of European beachgrass with wiper application, apply a 33.3-percent solution of this product plus 1 to 2.5 percent nonionic surfactant during active growth. Avoid contact of herbicide solution with desirable vegetation. Wiping the plants in opposite directions may improve performance. Maximizing the amount of individual leaf tissue contacted with the wiping equipment will result in optimal performance. | | |
| Bentgrass* | 1 | 1.5 |
| Bermudagrass | 4 | 1.5 |
| Apply to target plants when seed heads appear. | | |
| Bermudagrass, water (knotgrass) | 1 | 1.5 |
| Bindweed, field | 2.3 – 3.75 | 1.5 |
| Apply 3 to 3.75 quarts of this product per acre as a broadcast spray west of the Mississippi River and 2.3 to 3 quarts of this product per acre east of the Mississippi River. Apply when most target plants are at or beyond full bloom. New leaf development indicates active growth. For best results apply in late summer or fall. | | |
| Bluegrass, Kentucky | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Blueweed, Texas | 2.3 – 3.75 | 1.5 |
| Apply 3 to 3.75 quarts of this product per acre as a broadcast spray west of the Mississippi River and 2.3 to 3 quarts of this product per acre east of the Mississippi River. Apply when most target plants are at or beyond full bloom. New leaf development indicates active growth. For best results apply in late summer or fall. | | |
| Brackenfern | 2.3 – 3 | 0.75 – 1 |
| Apply to fully expanded fronds which are at least 18 inches long. | | |
| Bromegrass, smooth | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Bursage, woolly-leaf | – | 1.5 |
| Canarygrass, reed | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Cattail | 2.3 – 3.75 | 0.75 |
| Apply when target plants are actively growing and are at or beyond the early-to-full bloom stage of growth. Best results are achieved when application is made during the summer or fall months. | | |
| Clover; red, white | 2.3 – 3.75 | 1.5 |
| Cogongrass | 2.3 – 3.75 | 1.5 |
| Apply when cogongrass is at least 18 inches tall and actively growing in late summer or fall. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control. | | |
| Cordgrass | See Sect 8.1 | 2–8 |
| Schedule applications in order to allow 6 hours before treated plants are covered by tidewater. When applying spray to wet with hand-held equipment, use a 2 to 8 percent solution of this product. Ensure complete coverage of clumps but do not spray to the point of run-off. Follow specific application instructions in Section 8.1 **Aquatic Sites**. | | |
| Cutgrass, giant* | 3 | 1 |
| Repeat applications will be required to maintain such control, especially where vegetation is partially submerged in water. Allow for substantial regrowth to the 7- to 10-leaf stage prior to retreatment. | | |
| Dallisgrass | 2.3 – 3.75 | 1.5 |
| Dandelion | 2.3 – 3.75 | 1.5 |
| Dock, curly | 2.3 – 3.75 | 1.5 |
| Dogbane, hemp | 3 | 1.5 |
| Apply when most target plants have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall. | | |
| Fescue (except tall) | 2.3 – 3.75 | 1.5 |
| Fescue, tall | 2.3 | 1 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. | | |
| Guineagrass | 2.3 | 0.75 |
| Apply when most target plants have reached at least the 7-leaf stage of growth. | | |
| Hemlock, poison | 1.5 – 3 | 0.75 – 1.5 |
| Also see Hollow Stem Injection section of this label. | | |
| Horsenettle | 2.3 – 3.75 | 1.5 |
| Horseradish | 3 | 1.5 |
| Apply when most target plants have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall. | | |
| Iceplant | 1.5 | 1.5 |
| Ivy; German, cape | 1.5 – 3 | 0.75 – 1.5 |
| Jerusalem artichoke | 2.3 – 3.75 | 1.5 |
| Johnsongrass | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Kikuyugrass | 1.5 – 2.3 | 0.75 |
| Knapweed | 3 | 1.5 |
| Apply when most target plants have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall. | | |
| Knotweed; Bohemian, Giant, Japanese (*Polygonum bohemicum, P. sachalinense and P. cuspidatum*) Stem Injection: See the Hollow Stem Injection section of this label. Cut Stem: Cut stems cleanly just below the 2nd or 3rd node above the ground. Immediately apply 0.36 fluid ounce (10 mLs) of a 50-percent solution of this product into the 'well' or remaining internode. Ensure that removed upper plant material is carefully gathered and discarded so that it will not contact soil and regenerate plants from sprouting buds. Use of a bio-barrier such as cardboard, plywood or plastic sheeting is recommended. The combined total for all treatments must not exceed 8 quarts per acre. At 10 mL of a 50-percent solution, approximately 1500 stems per acre may be treated. | | |

| | | |
|---|---|---|
| Lantana | – | 0.75 – 1 |
| Apply when most target plants are at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth. | | |
| Lespedeza | 2.3 – 3.75 | 1.5 |
| Loosestrife, purple | 2 | 1 – 1.5 |
| Treat when most target plants are at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. | | |
| Lotus, American | 2 | 0.75 |
| Treat when most target plants are at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. Repeat treatment may be necessary to control regrowth from underground parts and seeds. | | |
| Maidencane | 3 | 0.75 |
| Repeat treatments will be required, especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the 7- to 10-leaf stage prior to retreatment. | | |
| Milkweed, common | 2.3 | 1.5 |
| Apply when most target plants have reached the late bud-to-flower stage of growth. | | |
| Muhly, wirestem | 1.5 – 2.3 | 0.75 |
| Apply when most target plants are at least 8 inches in height (3 to 4-leaf stage of growth) and actively growing. | | |
| Mullein, common | 2.3 – 3.75 | 1.5 |
| Napiergrass | 2.3 – 3.75 | 1.5 |
| Nightshade, silverleaf | 2.3 – 3.75 | 1.5 |
| Apply 3 to 3.75 quarts of this product per acre as a broadcast spray west of the Mississippi River and 2.3 to 3 quarts of this product per acre east of the Mississippi River. Apply when most target plants are at or beyond full bloom. Best results can be obtained when application is made after berries are formed. New leaf development indicates active growth. For best results apply in late summer or fall. | | |
| Nutsedge; purple, yellow | 2.3 | 0.75 |
| Apply this product to control existing nutsedge plants and immature nutlets attached to treated plants. Apply when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control. | | |
| Orchardgrass | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Pampasgrass | 2.3 – 3.75 | 1.5 |
| Para grass | 3 | 0.75 |
| Repeat treatments may be required. Allow for regrowth to the 7- to 10-leaf stage prior to retreatment. | | |
| Pepperweed, perennial | 3 | 1.5 |
| Phragmites* | 2 – 3.75 | 0.75 – 1.5 |
| For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 3.75 quarts per acre as a broadcast spray or apply a 1.5-percent solution with hand-held equipment. In other areas of the U.S., apply 2 to 3 quarts per acre as a broadcast spray or apply a 0.75-percent solution with hand-held equipment for partial control. For best results, treat during late summer or fall months when plants are actively growing and in full bloom. Due to the dense nature of the vegetation, which may prevent good spray coverage and uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop. | | |
| Quackgrass | 1.5 – 2.3 | 0.75 |
| Apply when most target plants are at least 8 inches in height (3 to 4-leaf stage of growth) and actively growing. | | |
| Redvine* | 1.5 | 1.5 |
| Reed, giant | 3 – 3.75 | 1.5 |
| Best results are obtained when applications are made in late summer to fall. Also see Hollow Stem Injection section of this label. | | |
| Ryegrass, perennial | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Salvinia, giant | 3 – 3.75 | 2 |
| Apply as a 2.0% v/v spray-to-wet solution with 0.5 to 2.0% v/v of a nonionic surfactant containing at least 70% active ingredient. For broadcast applications, apply 3 to 3.75 quarts of this product with an aquatic approved surfactant system containing 0.1% v/v nonionic organosilicone and 0.25% v/v nonionic spreader sticker surfactant in 3 to 40 gallons per acre as a broadcast treatment. Allow at least 3 days after application before disturbing treated vegetation. This product does not control plants which are completely submerged or have a majority of their foliage under water. | | |
| Smartweed, swamp | 2.3 – 3.75 | 1.5 |
| Spatterdock | 3 | 0.75 |
| Apply when most plants are in full bloom. For best results, apply during the summer or fall months. | | |
| Spurge, leafy* | – | 1.5 |
| Starthistle, yellow | – | 1.5 |
| Sweetpotato, wild* | – | 1.5 |
| Apply when most target plants are at or beyond the bloom stage of growth. Repeat applications will be required. Allow the plant to reach the specified stage of growth before retreatment. | | |
| Thistle, artichoke | 1.5 – 2.3 | 2 |
| Apply when target plants are at or beyond the bud stage of growth. | | |
| Thistle, Canada | 1.5 – 2.3 | 1.5 |
| Apply when target plants are at or beyond the bud stage of growth. Also see Hollow Stem Injection section of this label. | | |
| Timothy | 1.5 – 2.3 | 1.5 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |
| Torpedograss* | 3 – 3.75 | 0.75 – 1.5 |
| Use the lower recommended rates under terrestrial conditions and the higher rates under partially submerged or a floating mat conditions. Repeat treatments will be required to maintain such control. | | |
| Trumpetcreeper* | 1.5 – 2.3 | 1.5 |
| Tules, common | – | 1.5 |
| Apply to target plants at or beyond the seedhead stage of growth. After application, visual symptoms will be slow to appear and may not occur for 3 or more weeks. | | |
| Vaseygrass | 2.3 – 3.75 | 1.5 |
| Velvetgrass | 2.3 – 3.75 | 1.5 |
| Waterhyacinth | 2.5 – 3 | 0.75 – 1 |
| Apply when target plants are at or beyond the early bloom stage of growth. After application, visual symptoms may require 3 or more weeks to appear with complete necrosis and decomposition usually occurring within 60 to 90 days. Use the higher recommended rates when more rapid visual effects are desired. | | |
| Waterlettuce | – | 0.75 – 1 |
| Use higher recommended rates where infestations are heavy. Best results are obtained from mid-summer through winter applications. Spring applications may require retreatment. | | |
| Waterprimrose | – | 0.75 |
| Apply to plants that are at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for best control. | | |
| Wheatgrass, western | 1.5 – 2.3 | 0.75 |
| Apply when most target plants have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown. | | |

*Partial control

**Other perennials listed on this label** – Apply 2.3 to 3.75 quarts of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

## 12.3 Woody Brush and Trees

Apply this product after full leaf expansion, unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation. Apply when plants are actively growing. Thorough coverage of foliage is necessary for best results. Avoid application to drought-stressed plants.

In arid areas, best results are obtained when applications are made in the spring to early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.

When using hand-held equipment for low-volume directed-spray spot treatments, apply a 4- to 8-percent solution of this product.

Symptoms may not appear prior to frost or senescence with fall treatments.

Allow 7 or more days after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

| Weed Species | Broadcast Rate (QT/A) | Hand-Held Spray-To-Wet % Solution |
|---|---|---|
| Alder | 2.3 – 3 | 0.75 – 1.2 |
| Ash* | 1.5 – 3.75 | 0.75 – 1.5 |
| Aspen, quaking | 1.5 – 2.3 | 0.75 – 1.2 |
| Bearclover (Bearmat)* | 1.5 – 3.75 | 0.75 – 1.5 |
| Beech* | 1.5 – 3.75 | 0.75 – 1.5 |
| Birch | 1.5 | 0.75 |
| Blackberry | 2.3 – 3 | 0.75 – 1.2 |
| Blackgum | 1.5 – 3.75 | 0.75 – 1.5 |
| Bracken | 1.5 – 3.75 | 0.75 – 1.5 |
| Broom; French, Scotch | 1.5 – 3.75 | 1.2 – 1.5 |
| Buckwheat, California* | 1.5 – 3 | 0.75 – 1.5 |
| Cascara* | 1.5 – 3.75 | 0.75 – 1.5 |
| Castorbean | 1.5 – 3.75 | 1.5 |
| Also see Hollow Stem Injection section of this label. | | |
| Catsclaw* | – | 1.2 – 1.5 |
| For partial control, apply this product when at least 50 percent of the new leaves are fully developed. | | |

| | | |
|---|---|---|
| Ceanothus* | 1.5 – 3.75 | 0.75 – 1.5 |
| Chamise* | 1.5 – 3.75 | 0.75 |
| Cherry; bitter, black, pin | 1.5 – 3.75 | 1– 1.5 |
| Cottonwood, eastern | 1.5 – 3.75 | 0.75 – 1.5 |
| Coyote brush | 2.3 – 3 | 1.2 – 1.5 |
| For control, apply when at least 50 percent of the new leaves are fully developed. | | |
| Cypress; swamp, bald | 1.5 – 3.75 | 0.75 – 1.5 |
| Deerweed | 1.5 – 3.75 | 0.75 – 1.5 |
| Dewberry | 2.3 – 3 | 0.75 – 1.2 |
| Dogwood* | 3 – 3.75 | 1 – 2 |
| Elderberry | 1.5 | 0.75 |
| Elm* | 1.5 – 3.75 | 0.75 – 1.5 |
| Eucalyptus, bluegum | – | 1.5 |
| For control of eucalyptus resprouts, apply this product with hand-held equipment when resprouts are 6- to 12-feet tall. Ensure complete coverage. | | |
| Gallberry | 1.5 – 3.75 | 0.75 – 1.5 |
| Gorse* | 1.5 – 3.75 | 0.75 – 1.5 |
| Hackberry, western | 1.5 – 3.75 | 0.75 – 1.5 |
| Hasardia* | 1.5 – 3 | 0.75 – 1.5 |
| Hawthorn | 1.5 – 2.3 | 0.75 – 1.2 |
| Hazel | 1.5 | 0.75 |
| Hickory* | 3 – 3.75 | 1 – 2 |
| Honeysuckle | 2.3 – 3 | 0.75 – 1.2 |
| Hornbeam, American* | 1.5 – 3.75 | 0.75 – 1.5 |
| Huckleberry | 1.5 – 3.75 | 0.75 – 1.5 |
| Ivy, poison | 3 – 3.75 | 1.5 |
| Kudzu | 3 | 1.5 |
| Locust, black* | 1.5 – 3 | 0.75 – 1.5 |
| Madrone resprouts* | – | 1.5 |
| Magnolia, sweetbay | 1.5 – 3.75 | 0.75 – 1.5 |
| Manzanita* | 1.5 – 3.75 | 0.75 – 1.5 |
| Maple, red | 1 – 3.75 | 0.75 – 1.2 |
| For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when leaves are fully developed. For partial control, apply 1 to 3.75 quarts of this product per acre as a broadcast spray. | | |
| Maple, sugar | – | 0.75 – 1.2 |
| For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed. | | |
| Maple, vine* | 1.5 – 3.75 | 0.75 – 1.5 |
| Monkey flower* | 1.5 – 3 | 0.75 – 1.5 |
| Oak; black, white* | 1.5 – 3 | 0.75 – 1.5 |
| Oak; northern pin | 1.5 – 3 | 0.75 – 1.2 |
| For control, apply when at least 50 percent of the new leaves are fully developed. | | |
| Oak, poison | 3 – 3.75 | 1.5 |
| Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color. | | |
| Oak, post | 2.3 – 3 | 0.75 – 1.2 |
| Oak, red | – | 0.75 – 1.2 |
| For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed. | | |
| Oak, scrub* | 1.5 – 3 | 0.75 – 1.5 |
| Oak, southern red | 1.5 – 3.75 | 1 – 1.5 |
| Orange, Osage | 1.5 – 3.75 | 0.75 – 1.5 |
| Peppertree, Brazilian (Florida holly)* | 1.5 – 3.75 | 1.5 |
| Persimmon* | 1.5 – 3.75 | 0.75 – 1.5 |
| Pine | 1.5 – 3.75 | 0.75 – 1.5 |
| Poplar, yellow* | 1.5 – 3.75 | 0.75 – 1.5 |
| Prunus | 1.5 – 3.75 | 1– 1.5 |
| Raspberry | 2.3 – 3 | 0.75 – 1.2 |
| Redbud, eastern | 1.5 – 3.75 | 0.75 – 1.5 |
| Redcedar, eastern | 1.5 – 3.75 | 0.75 – 1.5 |
| Rose, multiflora | 1.5 | 0.75 |
| Treatments should be made prior to leaf deterioration by leaf-feeding insects. | | |
| Russian olive* | 1.5 – 3.75 | 0.75 – 1.5 |
| Sage, black | 1.5 – 3 | 0.75 |
| Sage, white* | 1.5 – 3 | 0.75 – 1.5 |
| Sagebrush, California | 1.5 – 3 | 0.75 |
| Salmonberry | 1.5 | 0.75 |
| Saltbush | – | 1 |
| Saltcedar | 3 – 3.75 | 1 – 2 |
| For partial control, apply a 1- to 2-percent solution of this product with hand-held equipment or 3 to 3.75 quarts per acre as a broadcast spray. For control, apply a 1- to 2-percent solution of this product mixed with 0.25-percent Arsenal with hand-held equipment. For control using broadcast applications, apply 1.5 quarts of this product in a tank-mix with 1 pint of Arsenal to plants less than 6 feet tall. To control saltcedar greater than 6 feet tall using broadcast applications, apply 3 quarts of this product in a tank-mix with 2 pints of Arsenal. | | |
| Sassafras* | 1.5 – 3.75 | 0.75 – 1.5 |
| Sea Myrtle | – | 1 |
| Sourwood* | 1.5 – 3.75 | 0.75 – 1.5 |
| Sumac; laurel, poison, smooth, sugarbush, winged* | 1.5 – 3 | 0.75 – 1.5 |
| Sweetgum | 1.5 – 2.3 | 0.75 – 1.5 |
| Swordfern* | 1.5 – 3.75 | 0.75 – 1.5 |
| Tallowtree, Chinese | – | 0.75 |
| Tanoak resprouts* | – | 1.5 |
| Thimbleberry | 1.5 | 0.75 |
| Tobacco, tree* | 1.5 – 3 | 0.75 – 1.5 |
| Toyon* | – | 1.5 |
| Trumpetcreeper | 1.5 – 2.3 | 0.75 – 1.2 |
| Vine maple* | 1.5 – 3.75 | 0.75 – 1.5 |
| Virginia creeper | 1.5 – 3.75 | 0.75 – 1.5 |
| Waxmyrtle, southern* | 1.5 – 3.75 | 1.5 |
| Willow | 2.3 | 0.75 |
| Yerba Santa, California* | – | 1.5 |

* Partial control

**Other woody brush and trees listed in this label** – For partial control, apply 1.5 to 3.75 quarts of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment.

# 13.0 LIMIT OF WARRANTY AND LIABILITY

Monsanto Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions'') when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

To the fullest extent permitted by law, buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission from this Company.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

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EPA Reg. No. 524-343

In case of an emergency involving this product, or for medical assistance,
Call Collect, day or night, (314) 694-4000.

MONSANTO

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St. Louis, Missouri, 63167 U.S.A.
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## ATENCIÓN:

Esta etiqueta de muestra se entrega únicamente para información general.

- Este producto pesticida puede no estar todavía disponible o aprobado para la venta o utilización en su localidad.
- Usted tiene la responsabilidad de cumplir todas las leyes federales, estatales y locales, así como todas las reglamentaciones relativas a la utilización de pesticidas.
- Antes de utilizar un pesticida, asegúrese de que esté aprobado en su estado o localidad.
- Su estado o localidad puede exigir precauciones adicionales e instrucciones para la utilización de este producto que no están incluidas aquí.
- Monsanto no garantiza el lo completo ni la certeza de esta etiqueta de la espécimen. La información encontró en esta etiqueta puede diferir de la información encontró en la etiqueta del producto. Usted debe tener consigo la etiqueta aprobada por la agencia EPA cuando utilice el producto y debe leer y respetar todas las instrucciones en la etiqueta.
- No debe basarse sobre las precauciones, las instrucciones de utilización y cualquier otra información en esta etiqueta para utilizar algún otro producto similar.
- Siempre siga las precauciones y las instrucciones para el uso en la etiqueta del pesticida que usted utiliza.

Roundup CUSTOM™

FOR AQUATIC & TERRESTRIAL USE

TRUEBLUE ADVANTAGE PROVEN | RELIABLE | SUPPORTED

# Instrucciones de Uso Completas

Roundup Custom™ para aplicaciones acuáticas y terrestres es un herbicida profesional completo de post emergencia y de amplia efectividad, para el control de malezas en zonas acuáticas, cultivos, lugares no cultivados, zonas industriales, céspedes, ornamentales, bosques, bordes de carretera y servidumbres de servicios públicos.

EPA Reg. No. 524-343 2012-2

| GROUP | 9 | HERBICIDE |
|---|---|---|

**EVITE EL CONTACTO DEL HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAÍCES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LOS CULTIVOS, PLANTAS Y ÁRBOLES DESEABLES. EN CASO CONTRARIO ES PROBABLE QUE SUFRAN GRAVES DAÑOS O SEAN DESTRUIDOS TOTALMENTE.**

Lea toda la etiqueta antes de utilizar este producto.

Use solo según las instrucciones de la etiqueta.

No todos los productos indicados en esta etiqueta han sido registrados para su uso en California. Verifique la situación de registro de cada producto en California antes de utilizarlo.

Antes de comprar o usar el producto, lea "LÍMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD" en la última sección de la etiqueta. Si las condiciones son inaceptables, devuelva el producto inmediatamente sin abrir el envase.

ESTE ES UN PRODUCTO PARA USARSE TAL Y COMO ESTÁ PREPARADO. MONSANTO NO LO HA DISEÑADO NI LO HA REGISTRADO PARA QUE SEA REFORMULADO. VEA LA ETIQUETA DEL ENVASE INDIVIDUAL PARA ENTERARSE DE LAS LIMITACIONES DE REEMPAQUE.

**INFORMACIÓN SOBRE EL PRODUCTO**

## 1.0 INGREDIENTES

INGREDIENTE ACTIVO:

*Glifosato, n-(fosfonometil) glicina, en la forma de su sal de isopropilamina .....53.8%
OTROS INGREDIENTES: ..... 46.2%
100.0%

*Contiene 648 gramos por litro o 5.4 libras por galón americano del ingrediente activo glifosato, en forma de su sal de isopropilamina. Equivalente a 480 gramos por litro o 4.0 libras por galón americano del ácido, glifosato.

No se han otorgado licencias de uso bajo ninguna patente que no sea de los Estados Unidos de América.

## 2.0 NÚMEROS DE TELÉFONO IMPORTANTES

PARA INFORMACIÓN SOBRE EL PRODUCTO O AYUDA PARA UTILIZAR ESTE PRODUCTO, LLAME GRATIS AL, **1-800-332-3111.**
EN CASO DE **EMERGENCIA** CON RESPECTO A ESTE PRODUCTO O PARA SOLICITAR ASISTENCIA MÉDICA, LLAME CON CARGO REVERTIDO, LAS 24 HORAS, AL, **(314)-694-4000.**

## 3.0 DECLARACIONES PREVENTIVAS

### 3.1 Riesgos para seres humanos y animales domésticos

Manténgase Fuera del Alcance de los Niños.

¡PRECAUCIÓN!

ANIMALES DOMÉSTICOS: Se considera que este producto es relativamente no tóxico para perros y otros animales domésticos, sin embargo, la ingestión de este producto o de abundantes cantidades de vegetación rociada recientemente puede causar irritación gastrointestinal temporal (vómitos, diarrea, cólicos, etc.). Si observa estos síntomas, dé de beber al animal abundante cantidad de líquido para evitar su deshidratación. Llame a un veterinario si los síntomas persisten más de 24 horas.

**Equipo de protección personal (PPE)**

**Los usuarios y personas que manipulan este producto deben usar:** camisas de mangas largas y pantalones largos, además de zapatos y calcetines. Respete las instrucciones del fabricante para limpiar y mantener el equipo de protección personal (PPE). En caso de que no haya instrucciones, lave el equipo protector con detergente y agua caliente. Mantenga el PPE apartado del resto de la ropa, y lávelo por separado.

Declaraciones de control de ingeniería: Cuando las personas que manipulan el producto emplean sistemas cerrados, cabinas encerradas o avionetas de acuerdo con los requisitos de las Normas de Protección para Trabajadores (WPS) para pesticidas agrícolas [40 CFR 170.240 (d) (4-6)], los requisitos con respecto a los equipos de protección personal de esas personas pueden reducirse o modificarse como se especifica en esas normas.

**Recomendaciones de seguridad para el usuario:**

Los usuarios deben:

- Lavarse las manos antes de comer, beber, masticar cicle, usar tabaco o usar el baño.
- Quitarse la ropa contaminada y lavarla antes de volver a usarla.

### 3.2 Riesgos para el medio ambiente

No contamine el agua al lavar el equipo o al tirar el agua de lavado. El tratamiento de la maleza acuática puede causar disminución o pérdida de oxígeno debido a la descomposición de las plantas muertas. Esta pérdida de oxígeno puede sofocar a los peces.

En caso de DERRAME o PÉRDIDA, seque el producto y deseche en un relleno.

### 3.3 Riesgos Físicos o Químicos

Para mezclar, almacenar y aplicar la solución de rocío de este producto, se deben usar solamente envases de acero inoxidable, fibra de vidrio, plástico o envases de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O LAS SOLUCIONES DE ROCÍO DE ESTE PRODUCTO EN ENVASES DE ACERO GALVANIZADO O SIN REVESTIMIENTO (EXCEPTO ACERO INOXIDABLE) O EN TANQUES DE ROCÍO. Si se utiliza en estos envases o tanques, este producto o las soluciones de rocío de este producto reaccionan y producen gas hidrógeno que puede formar una mezcla de gases altamente inflamable. Esta mezcla de gases podría resultar inflamable o explotar y causar lesiones graves si está en contacto con fuego, chispas, sopletes para soldar, cigarrillos encendidos o cualquier otra fuente de ignición.

## MODO DE EMPLEO

Se considera una violación a la ley federal usar este producto de una manera que no sea la indicada en la etiqueta. Este producto solo puede utilizarse de acuerdo con las instrucciones de modo de empleo que figuran en esta etiqueta, en etiquetas

complementarias separadas o fichas técnicas publicadas por Monsanto. Puede consultar las etiquetas adicionales en Internet en www.cdms.net, www.agrian.com o www.greenbook.net, pero puede que su uso no esté aprobado en todos los estados. También puede solicitarlas a su vendedor minorista autorizado de Monsanto o a su representante de Monsanto Company.

No aplique este producto de alguna manera que entre en contacto con los trabajadores u otras personas, ya sea directamente o por arrastre. Solamente las personas que manipulan este producto y usan protección personal podrán estar en el área durante su aplicación. Para verificar requisitos específicos de su tribu o estado, consulte con la agencia responsable de la regulación del uso de pesticidas.

### Requisitos para uso agrícola

Utilice este producto solo de acuerdo con la etiqueta y con las Normas de Protección para Trabajadores, 40 CFR Parte 170. Estas normas contienen los requisitos para la protección de trabajadores agrícolas en granjas, bosques, viveros e invernaderos y para las personas que manipulan pesticidas agrícolas. Contienen los requisitos para capacitar, descontaminar, notificar y ofrecer asistencia de emergencia. También contienen instrucciones específicas y excepciones relativas a las afirmaciones en esta etiqueta sobre equipos de protección personal (PPE) y los intervalos de acceso restringido. Los requisitos en esta caja se refieren solo a las aplicaciones de este producto cubiertas por las Normas de Protección para Trabajadores.

No entre ni permita la entrada de personal a las áreas tratadas durante el intervalo de entrada restringida (REI) de 4 horas.

Los equipos de protección personal (PPE) requeridos para el acceso anticipado a zonas tratadas que se permite en las Normas de Protección para Trabajadores y que significan contacto con material tratado, como plantas, tierra o agua, son: overoles, zapatos, calcetines y guantes resistentes a sustancias químicas confeccionados con cualquier tipo de material impermeable.

### Requisitos para uso no agrícola

Los requisitos en esta caja se refieren a las aplicaciones de este producto que NO cubren las Normas de Protección para Trabajadores para pesticidas agrícolas (40 CFR, Parte 170). Las regulaciones del WPS se aplican cuando el producto se usa para obtener productos agrícolas en granjas, bosques, viveros e invernaderos.

Mantenga a las personas y a los animales domésticos fuera del área tratada hasta que la solución rociada se haya secado.

## 4.0 ALMACENAMIENTO Y ELIMINACIÓN

El almacenamiento y la eliminación adecuados de los pesticidas son fundamentales para evitar la exposición de las personas y el medio ambiente como consecuencia de pérdidas y derrames del producto, excedentes o desechos y actos de vandalismo. No permita que este producto contamine el agua, ni los alimentos para personas ni animales, ni las semillas, por medio del almacenamiento o la eliminación.

**ALMACENAMIENTO DEL PESTICIDA:** GUARDE A UNA TEMPERATURA SUPERIOR A LOS 5°F (-15°C) PARA EVITAR LA CRISTALIZACIÓN. Los cristales se depositarán en el fondo. Si se cristaliza, colóquelo en una habitación cálida a 68°F (20°C) por varios días para volver a disolver y haga rodar o agite el envase, o bien haga recircular en envases tipo mini-bulk para mezclar bien antes de usarlo. Guarde los pesticidas lejos de los alimentos para personas, los alimentos para mascotas, los alimentos para animales, las semillas, los fertilizantes y los materiales de uso veterinario. Mantenga el envase bien cerrado para evitar derrames y contaminación.

**ELIMINACIÓN DEL PESTICIDA:** Para evitar desechos, utilice todo el material contenido en este envase, incluido los residuos del enjuague, aplicándolo según las indicaciones de la etiqueta. Si no se pueden evitar los desechos, ofrezca el producto restante a un centro de eliminación de desechos o a un programa de desecho de pesticidas. Estos programas suelen ser manejados por los gobiernos estatales o locales o por la industria. Toda eliminación debe seguir los reglamentos y procedimientos federales, estatales y locales que apliquen.

**MANEJO Y ELIMINACIÓN DEL ENVASE:** Consulte la etiqueta del envase para las instrucciones de manejo y eliminación del envase, así como las limitaciones para rellenarlo.

## 5.0 INFORMACIÓN SOBRE EL PRODUCTO

**Descripción del producto:** Este producto es un herbicida sistémico de aplicación post emergencia foliar, sin actividad residual en el suelo. Controla un amplio espectro de malezas anuales, malezas perennes, matorrales leñosos y árboles. Está formulado como un líquido soluble en agua y se puede aplicar utilizando equipos convencionales después de su dilución y mezclado con agua o con otros medios de transporte según las instrucciones de la etiqueta.

**Aparición de los síntomas:** Este producto se mueve dentro de la planta desde el punto de aplicación sobre el follaje hasta las raíces. Los efectos visibles incluyen que la planta se marchite y se vuelva amarilla gradualmente, hasta que su parte exterior se pone completamente marrón; mientras tanto, las partes de la planta que están bajo tierra se deterioran completamente. Los efectos visibles en la mayoría de las malezas anuales se pueden apreciar de 2 a 4 días después de la aplicación, pero en la mayoría de las malezas perennes es posible que no se observen hasta después de 7 días o más. El frío extremo o el cielo muy nublado después de la aplicación pueden retardar la actividad del producto y hacer que el efecto visual se demore.

**Etapas de malezas:** Resulta más fácil controlar las malezas anuales cuando son pequeñas. La mayoría de las malezas perennes se controla mejor cuando el tratamiento se realiza en las últimas etapas de crecimiento antes de la madurez. Vea en las secciones TIPOS DE MALEZAS CONTROLADAS de esta etiqueta las proporciones específicas para cada tipo de maleza.

Aplique siempre la mayor proporción de producto dentro del rango indicado cuando las malezas son muy densas o cuando crecen en áreas no tocadas (no cultivadas). Puede haber una disminución de los resultados cuando se traten malezas afectadas por enfermedades o dañadas por los insectos, malezas cubiertas con mucho polvo o malezas en malas condiciones de crecimiento.

**Modo de acción en las plantas:** El ingrediente activo de este producto inhibe una enzima en las plantas y microorganismos que es esencial para la formación de aminoácidos específicos.

**Prácticas culturales:** Se podrá observar una reducción en el efecto si se aplica el producto a malezas anuales o perennes que hayan sido segadas, que hayan servido de alimento para animales o hayan sido cortadas, y que no hubiesen crecido nuevamente hasta el nivel recomendado para el tratamiento.

**Resistencia a la lluvia:** Una lluvia intensa poco tiempo después de su aplicación puede lavar este producto del follaje y puede requerirse una nueva aplicación para el control adecuado de las malezas.

**Cobertura del rocío:** Para obtener mejores resultados, la cobertura del rocío debe ser completa y uniforme. No rocíe el follaje hasta el punto de escurrimiento.

**No actividad en el suelo:** Las malezas deben haber emergido en el momento de la aplicación para poder ser controladas por este producto. Las malezas que germinen de semillas después de la aplicación no serán controladas. Las plantas no emergidas con rizomas o raíces subterráneas de malezas perennes no conectadas no se verán afectadas por el herbicida y continuarán creciendo.

Proporciones de aplicación máximas: Las proporciones de aplicación o uso máximas recomendadas en toda esta etiqueta se indican en unidades de volumen (onzas líquidas o cuartos de galón) de este producto por acre. Sin embargo, las proporciones máximas permitidas se aplican a este producto combinado con todos y cada uno de los otros herbicidas que contienen el ingrediente activo glifosato, ya sea que se apliquen por separado o como mezclas de tanque, sobre la base de un total de gramos o libras de glifosato (equivalentes ácidos) por acre. Si se aplica más de un producto que contiene glifosato en el mismo terreno el mismo año, debe asegurarse de que el total de glifosato empleado (equivalentes de gramos o libras de ácido) no exceda el máximo permitido. El total combinado de todos los tratamientos no debe exceder 8 cuartos de galón de este producto (8 libras de ácido glifosato) por acre por año. Consulte en la sección **INGREDIENTES** de esta etiqueta la información necesaria sobre el producto.

**ATENCIÓN**

EVITE EL CONTACTO DEL HERBICIDA CON EL FOLLAJE, TALLOS VERDES, RAÍCES NO LEÑOSAS EXPUESTAS O FRUTOS EXPUESTOS DE LOS CULTIVOS, PLANTAS Y ÁRBOLES DESEABLES. EN CASO CONTRARIO ES PROBABLE QUE SUFRAN GRAVES DAÑOS O SEAN DESTRUIDOS TOTALMENTE.

EVITE EL ARRASTRE. TENGA MUCHO CUIDADO CUANDO APLIQUE ESTE PRODUCTO PARA EVITAR DAÑOS A PLANTAS Y CULTIVOS DESEABLES.

No permita que la solución herbicida se vaporice, gotee, arrastre o salpique sobre la vegetación deseable ya que incluso cantidades ínfimas de este producto pueden causar daños graves o destruir el cultivo, plantas u otras áreas que no se desean tratar. Las probabilidades de daño causado por el uso de este producto aumentan cuando hay viento con ráfagas, cuando la velocidad del viento aumenta, cuando la dirección del viento cambia constantemente o cuando hay otras condiciones meteorológicas que favorecen el arrastre por rocío. Al rociar, evite las combinaciones de presión y tipo de boquillas que resulten en salpicaduras o partículas finas (niebla) que es probable que se dispersen. EVITE APLICAR A UNA VELOCIDAD O PRESIÓN EXCESIVA.

**NOTA:** El uso de este producto de cualquier manera contraria a las indicaciones contenidas en esta etiqueta, puede resultar en lesiones a personas, animales o cultivos o pueden ocurrir otras consecuencias no deseadas.

## 5.1 Manejo de resistencia de malezas

| GROUP | 9 | HERBICIDE |
|---|---|---|

El glifosato, ingrediente activo en este producto, es un herbicida del Grupo 9 basado en el sistema de clasificación de efecto de Weed Science Society (La Asociación de la Ciencia de la Maleza) de los Estados Unidos. Todas las poblaciones de malezas pueden contener plantas naturalmente resistentes a los herbicidas del Grupo 9. Las especies de malezas resistentes a los herbicidas del Grupo 9 pueden tratarse con buenos resultados utilizando otro herbicida de un Grupo diferente o adoptando otras prácticas de cultivo o mecánicas.

Para reducir al mínimo la incidencia de biotipos resistentes al glifosato, respete las siguientes recomendaciones generales con respecto al manejo de malezas:

- Haga un reconocimiento del sitio de la aplicación antes y después de haber aplicado herbicidas.
- Controle las malezas cuanto antes, cuando sean todavía relativamente pequeñas.
- Incorpore otros herbicidas y prácticas de cultivo o mecánicas como parte de su sistema de control de malezas cuando sea adecuado.
- Utilice la proporción indicada en la etiqueta para las malezas más difíciles de controlar en el sitio. Evite las mezclas de tanque con otros herbicidas que reducen la eficacia de este producto (por antagonismo) o las recomendaciones de mezclas de tanque que alientan la utilización de cantidades de este producto inferiores a las recomendaciones de esta etiqueta.
- Controle las malezas omitidas e impida que echen semilla.
- Limpie los equipos antes de trasladarse de un sitio a otro para reducir al mínimo la propagación de semillas de malezas.
- Utilice semillas comerciales nuevas con la menor cantidad posible de semillas de malezas.
- Informe todo incidente por falta de rendimiento reiterado de este producto en una maleza determinada al representante de Monsanto, vendedor minorista de su localidad o agente de extensión del condado.

## 5.2 Manejo para biotipos resistentes al glifosato

**NOTA:** Es fundamental realizar las pruebas adecuadas para confirmar la resistencia de la maleza al glifosato. Póngase en contacto con su representante de Monsanto para determinar si se confirmó la resistencia de algún biotipo de maleza en particular en su región. Las recomendaciones de control para biotipos confirmados como resistentes al glifosato se dan a conocer con la publicación de etiquetas o fichas técnicas complementarias para este producto y puede solicitarlas al vendedor minorista o a su representante de Monsanto.

Debido a que no es posible determinar la existencia de nuevas malezas resistentes al glifosato hasta que se haya utilizado el producto y se cuente con la confirmación científica correspondiente, Monsanto Company no será responsable de ninguna pérdida que pudiera tener lugar en el caso de que este producto no lograra controlar de forma eficaz los biotipos de malezas resistentes al glifosato.

Siga las siguientes prácticas correctas de manejo de malezas para reducir la propagación de biotipos resistentes al glifosato confirmados:

- Si en su zona existe naturalmente un biotipo resistente, para lograr su control puede mezclar este producto en un tanque o aplicarlo secuencialmente con un herbicida debidamente aprobado con efecto diferente.
- También se pueden utilizar prácticas de control culturales y mecánicas según corresponda.
- Haga un reconocimiento de los lugares tratados después de las aplicaciones de herbicida y controle las omisiones de biotipos resistentes antes de que echen semilla.
- Limpie minuciosamente los equipos antes de abandonar los lugares que se saben que contienen biotipos resistentes.

# 6.0 MEZCLA

Para mezclar, almacenar y aplicar la solución de rocío de este producto, se deben usar solamente envases de acero inoxidable, fibra de vidrio, plástico o envases de acero recubiertos internamente con plástico.

NO MEZCLE, ALMACENE O APLIQUE ESTE PRODUCTO O LAS SOLUCIONES DE ROCÍO DE ESTE PRODUCTO EN ENVASES DE ACERO GALVANIZADO O SIN REVESTIMIENTO (EXCEPTO ACERO INOXIDABLE) O EN TANQUES DE ROCÍO.

Proceda con precaución para evitar el retorno del líquido a la fuente de transporte. Utilice aparatos aprobados contra el retorno en lugares donde lo exijan las normas locales o estatales.

Limpie las piezas del rociador inmediatamente después de usar este producto lavándolas bien con agua.

**NOTA:** EL RENDIMIENTO DEL PRODUCTO PODRÍA REDUCIRSE SI SE UTILIZA AGUA CON SEDIMENTOS DE TIERRA COMO SUSTANCIA PORTADORA O AGUA CON BARRO VISIBLE O AGUA DE ESTANQUES O ACEQUIAS QUE NO ESTÉ CLARA.

## 6.1 Mezcla con agua

Este producto se mezcla fácilmente con agua. Mezcle las soluciones de rocío de este producto de la siguiente manera: Ponga la cantidad correcta de agua limpia en el tanque en el cual se va a preparar la mezcla. Agregue la cantidad recomendada de este producto cuando ya está cerca de completarse el llenado con agua y mezcle con cuidado (bien). Durante la mezcla y aplicación, se puede formar espuma en la solución de rocío. Para prevenir o minimizar la formación de espuma, evite el uso de agitadores mecánicos, cierre las tuberías de retorno y de paso en la parte posterior del tanque y, en caso de que sea necesario, utilice un agente aprobado anti espuma o que elimine la espuma.

## 6.2 Mezclas de tanque

Este producto no proporciona control de malezas residuales. Este producto puede mezclarse en tanques con otros herbicidas para proporcionar control residual contra malezas, un espectro más amplio de control de malezas o un modo de acción alternativo. Siempre lea y siga las instrucciones de la etiqueta para todos los productos en la mezcla de tanque.

Cuando utilice este producto mezclado en tanque con otros, consulte las etiquetas de cada producto para los sitios y proporciones de aplicación aprobados. Lea y siga cuidadosamente las indicaciones y toda la información en las etiquetas de todos los herbicidas utilizados. Use conforme a las declaraciones preventivas más restrictivas de cada producto en la mezcla. Para la mezcla en tanque, puede utilizarse cualquier proporción de este producto que se encuentre dentro del rango indicado en la etiqueta.

Cuando esta etiqueta indique una mezcla de tanque con un ingrediente activo genérico como diurón, 2,4-D o dicamba, el usuario será responsable de asegurarse de que la etiqueta del producto de mezcla permita la aplicación específica.

El comprador y todos los usuarios son responsables por todas las pérdidas o daños en relación con el uso o el manejo de mezclas de este producto con herbicidas u otros materiales que no se recomiendan expresamente en esta etiqueta. La mezcla de este producto con herbicidas u otros materiales no recomendados en esta etiqueta puede dar como resultado una reducción en su rendimiento.

Este producto brinda control de las malezas emergidas indicadas en esta etiqueta. Cuando se aplican como mezcla de tanque, los herbicidas siguientes proporcionan control pre emergencia y/o post emergencia de las malezas indicadas en las etiquetas de los productos individuales.

Este producto puede ser mezclado en el tanque con los productos siguientes. Cualquier proporción de este producto que se encuentre dentro del rango recomendado en la etiqueta se puede utilizar en una mezcla de tanque con estos productos. El usuario será responsable de asegurarse de que el producto específico esté aprobado para el área de uso deseada. Consulte las etiquetas de estos productos para informarse sobre las áreas de uso y las proporciones de aplicación aprobadas. Lea y siga cuidadosamente las indicaciones y toda la información en las etiquetas de todos los herbicidas utilizados. Use conforme a las declaraciones preventivas más restrictivas de cada producto en la mezcla.

**Productos de mezcla de tanque**

Arsenal
Banvel
2,4-D
Garlon 3A
Garlon 4
diuron
diuron + 2,4-D
diuron + Garlon 3A
diuron + Garlon 4
Hyvar X
Hyvar X + 2,4-D
Hyvar X + Garlon 3A
Hyvar X + Garlon 4
Krovar I DF
Krovar I DF + 2,4-D
Krovar I DF + Garlon 3A
Krovar I DF + Garlon 4
Oust XP
Oust XP + 2,4-D
Oust XP + Garlon 3A
Oust XP + Garlon 4
Ronstar
Spike 80W
Spike 80W + 2,4-D
Spike 80W + Garlon 3A
Spike 80W + Garlon 4
Surflan

Cuando se usa en combinación según las recomendaciones de Monsanto Company, de ninguna manera la responsabilidad de Monsanto abarcará cualquier daño, pérdida o lesión que no sea causado directa y exclusivamente por la inclusión del producto de Monsanto en dicha aplicación combinada.

## 6.3 Procedimiento de mezcla de tanque

Cuando prepare mezclas de tanque, lea y siga cuidadosamente las instrucciones de la etiqueta, las declaraciones preventivas y toda la información contenida en las etiquetas de todos los productos utilizados. Agregue el producto al tanque de mezcla según las instrucciones de la etiqueta. Agite continuamente y agregue la cantidad recomendada de este producto.

Continúe agitando bien todo el tiempo durante el proceso de mezclado. Asegúrese de que los productos de la mezcla de tanque estén bien mezclados con la solución de rocío antes de agregar este producto.

Mezcle solo la cantidad de solución de rocío que puede usar el mismo día. El control de malezas puede ser inferior si las mezclas de tanque se dejan reposar toda la noche.

Continúe agitando bien todo el tiempo hasta que termine de rociar todo el contenido del tanque. Si se deja asentar la mezcla para rociar, agite bien para que la mezcla vuelva a estar en suspensión antes de continuar con el rocío.

A fin de minimizar la formación de espuma, mantenga las tuberías de retorno lo más cerca del fondo del tanque. La malla de la rejilla en la boquilla o en los coladores de las mangueras no debe ser de menos de 50 hilos.

Siempre determine con anticipación la compatibilidad de todos los productos de la mezcla de tanque indicados con el agua como sustancia portadora, mezclando antes pequeñas cantidades proporcionales. Asegúrese de que la mezcla de tanque específica esté aprobada para su aplicación en el área deseada.

## 6.4 Mezcla de soluciones en porcentaje

Prepare el volumen deseado de solución de rocío mezclando en agua la cantidad indicada de este producto, como se indica en la siguiente tabla:

**Solución de rocío**

| Volumen | Cantidad de Roundup Custom para uso acuático y terrestre | | | | | |
|---|---|---|---|---|---|---|
| Deseado | 0.5% | 0.75% | 1% | 1.5% | 4% | 8% |
| 1 gal | 2/3 oz | 1 oz | 1.3 oz | 2 oz | 5 oz | 10 oz |
| 25 gal | 1 pt | 1.5 pt | 1 qt | 1.5 qt | 4 qt | 2 gal |
| 100 gal | 2 qt | 3 qt | 1 gal | 1.5 gal | 4 gal | 8 gal |

2 cucharadas soperas = 1 onza líquida

Cuando se usen rociadores tipo mochila, o para bombeo, se recomienda que la cantidad indicada en la etiqueta de este producto se mezcle con agua en un envase grande. Llene el rociador con la solución de la mezcla.

## 6.5 Surfactante

Este producto requiere el uso de un surfactante no iónico a menos que se especifique lo contrario. Al usar este producto, a menos que se especifique lo contrario, mezcle 2 o más cuartos de galón de un surfactante no iónico por cada 100 galones de solución de rocío. Aumentar la proporción de surfactante puede mejorar el rendimiento. Algunos ejemplos de cuándo usar una proporción mayor de surfactante incluyen, pero no se limitan a: matorrales leñosos difíciles de controlar, árboles y enredaderas, volúmenes de mareas altas, condiciones ambientales adversas, malezas difíciles de controlar, malezas bajo estrés, surfactantes con menos de un 70 por ciento de ingrediente activo, mezclas de tanque, etc.

Siempre lea y siga las instrucciones de la etiqueta del fabricante del surfactante para obtener los mejores resultados. Cumpla cuidadosamente con todas las declaraciones preventivas y toda la información adicional que aparezca en la etiqueta del surfactante.

## 6.6 Colorantes o tinturas

A este producto se le pueden agregar colorantes o tinturas para marcar, que sean aprobados para uso agrícola. A bajas concentraciones o diluciones, los colorantes o tinturas usados en las soluciones de rocío de este producto pueden reducir su rendimiento. Utilice los colorantes o las tinturas según las instrucciones del fabricante.

## 6.7 Aditivos de reducción de arrastre

Se pueden utilizar aditivos para el control del arrastre en todos los tipos de equipo, a excepción de aplicadores con enjugador y barras de esponja. Cuando se use un aditivo para el control del arrastre, lea y cumpla cuidadosamente con las declaraciones preventivas y toda la información adicional que aparezca en la etiqueta del aditivo. El uso de aditivos para el control del arrastre puede afectar la cobertura del rocío, lo que puede dar como resultado una reducción en el rendimiento.

# 7.0 EQUIPOS Y TÉCNICAS PARA LA APLICACIÓN

No use ningún sistema de irrigación para aplicar este producto.

APLIQUE ESTAS SOLUCIONES DE ROCÍO UTILIZANDO EQUIPOS DEBIDAMENTE MANTENIDOS Y CALIBRADOS QUE SEAN CAPACES DE ROCIAR EL VOLUMEN DESEADO.

**MANEJO DEL ARRASTRE DEL ROCÍO**

EVITE EL ARRASTRE. TENGA MUCHO CUIDADO CUANDO APLIQUE ESTE PRODUCTO PARA EVITAR DAÑOS A PLANTAS Y CULTIVOS DESEABLES.
No permita que la solución herbicida se vaporice, gotee, arrastre o salpique sobre la vegetación deseable ya que incluso cantidades ínfimas de este producto pueden causar daños graves o destruir el cultivo, plantas u otras áreas que no se desean tratar.
Es responsabilidad del aplicador evitar el arrastre por rocío en el lugar de aplicación. La interacción de varios factores relacionados con el clima y el equipo determina la posibilidad de arrastre por rocío. El aplicador y/o el cultivador son responsables de considerar todos estos factores al tomar decisiones.

## 7.1 Equipos aéreos

NO APLIQUE ESTE PRODUCTO CON EQUIPOS AÉREOS EXCEPTO BAJO LAS CONDICIONES QUE SE ESPECIFICAN EN ESTA ETIQUETA.

EN CASO DE APLICACIÓN AÉREA EN ARKANSAS Y CALIFORNIA, O EN CONDADOS ESPECÍFICOS DE ESOS ESTADOS, CONSULTE EN LA ETIQUETA COMPLEMENTARIA FEDERAL LAS INSTRUCCIONES, RESTRICCIONES Y REQUISITOS ESPECÍFICOS PARA APLICACIONES AÉREAS EN ESE ESTADO O CONDADO.

Este producto, al ser mezclado en tanques con dicamba, no se puede aplicar por aire en el estado de California. Solo se pueden utilizar formulaciones de 2,4-D amina para la aplicación aérea en California.

Use las proporciones recomendadas de este producto en 3 a 25 galones de agua por acre.

PARA EVITAR DAÑAR LA VEGETACIÓN DESEABLE ADYACENTE, SE DEBEN MANTENER ZONAS DE TRANSICIÓN ADECUADAS.

Evite la aplicación directa en masas de agua. Pueden usarse aditivos para el control del arrastre. Al utilizar un aditivo para controlar el arrastre, lea y cumpla meticulosamente con las declaraciones preventivas y toda la demás información que aparece en la etiqueta del aditivo.

Asegúrese de que la aplicación sea uniforme. A fin de evitar que queden áreas sin tratar, que la aplicación no sea uniforme o que las aplicaciones se traslapen, se deben usar marcadores adecuados.

**Mantenimiento de aviones**

EL CONTACTO PROLONGADO DE ESTE PRODUCTO CON PARTES DE ACERO QUE NO ESTE RECUBIERTO CON ALGUN TIPO DE PROTECCIÓN, PUEDE CAUSAR CORROSIÓN Y POSIBLEMENTE QUE LAS PARTES FALLEN. Es posible prevenir la corrosión recubriendo las partes con pintura orgánica, que cumpla con las especificaciones aeroespaciales MIL-C-38413. Al final de cada día de trabajo, para evitar la corrosión de las partes expuestas, lave muy bien el avión a fin de remover los residuos de este producto que se acumulan durante el rocío o por derramamientos. El tren de aterrizaje es extremadamente susceptible.

**MANEJO DEL ARRASTRE DEL ROCÍO AEREO**

Deben seguirse los siguientes requisitos de manejo del arrastre para evitar el movimiento de éste fuera del objetivo en aplicaciones aéreas a campos de cultivo agrícola. Estos requisitos no incluyen las aplicaciones forestales ni los usos en salud pública.

1. La distancia de la boquilla más externa en el brazo no debe exceder 3/4 del largo de la envergadura o rotor.
2. Las boquillas deben siempre apuntar hacia atrás, paralelas a la corriente de aire, nunca hacia abajo más de 45 grados. En los estados con reglamentos más estrictos, éstos deben observarse.

**Importancia del tamaño de las gotas**

La forma más eficaz de reducir la posibilidad de arrastre es la aplicación de gotitas grandes. La mejor estrategia de manejo del arrastre es la aplicación de las gotitas más grandes que provean suficiente cobertura y control. La aplicación de gotitas más grandes reduce la posibilidad de arrastre, pero no la evitará si las aplicaciones se realizan inadecuadamente o bajo condiciones ambientales desfavorables (vea las secciones de Viento, Temperatura y humedad, e Inversiones de temperatura en esta etiqueta).

**Control del tamaño de las gotas**

**Volumen:** Use boquillas de velocidad de flujo alta para aplicar el mayor volumen de rocío práctico. Las boquillas con mayores velocidades de flujo producen gotitas más grandes.

**Presión:** Use las presiones de rocío más bajas recomendadas para la boquilla. La presión más alta reduce el tamaño de la gotita y no mejora la penetración de la superficie. Cuando sean necesarias velocidades de flujo mayores, use boquillas con velocidad de flujo mayor en lugar de aumentar la presión.

**Cantidad de boquillas:** Utilice la cantidad mínima de boquillas que brinden una cobertura uniforme.

**Orientación de las boquillas:** Si orienta las boquillas de modo que liberen el rocío hacia atrás, en sentido paralelo a la circulación del aire, producirán gotas más grandes que si las orienta de otro modo. Cuanto más desviadas estén del plano horizontal, tanto más pequeñas serán las gotas y tanto mayor el potencial de arrastre.

**Tipo de boquilla:** Utilice un tipo de boquilla diseñado para la aplicación deseada. Con la mayoría de los tipos de boquillas, cuanto menor sea el ángulo de rocío tanto mayor serán las gotas. Considere el uso de boquillas de poco arrastre. Las boquillas de caudal directo orientadas directamente hacia atrás producen gotas más grandes que otros tipos de boquillas.

**Longitud del brazo:** En algunos esquemas de uso, la reducción de la longitud efectiva del brazo a menos de 3/4 de la envergadura o de la longitud del rotor puede reducir el arrastre aún más sin reducir el ancho de la franja.

**Altura de la aplicación:** Las aplicaciones no deben realizarse a una altura mayor que 10 pies por encima de la copa de las plantas más grandes, a menos que se requiera mayor altura por razones de seguridad del aeroplano. Realizar las aplicaciones a la menor altura que sea segura reduce la exposición de las gotitas a la evaporación y el viento.

**Ajuste de franja**

Cuando las aplicaciones se lleven a cabo con viento lateral, la franja de aspersión se desplazará a favor del viento. Por ello, en los extremos con o contra el viento del campo, el aplicador debe compensar este desplazamiento ajustando la trayectoria del aeroplano contraria al viento. La distancia de ajuste de la franja debe aumentar, cuando aumenta la posibilidad de arrastre (mayor viento, gotitas más pequeñas, etc.).

**Viento**

El potencial de arrastre es menor cuando la velocidad del viento es de 2 a 10 millas por hora. Sin embargo, muchos factores, incluyendo el tamaño de las gotitas y el tipo de equipo determinan la posibilidad de arrastre a una velocidad determinada. Se debe evitar la aplicación a menos de 2 millas por hora debido a los cambios de dirección del viento y la posibilidad de inversión. NOTA: El terreno local puede influir en los patrones de viento. Las personas que aplican el producto deben estar familiarizadas con los modelos locales de vientos y saber cómo afectan el arrastre.

**Temperatura y humedad**

Cuando se realizan aplicaciones con humedad relativa baja, fije el equipo para que produzca gotitas más grandes para compensar por la evaporación. La evaporación de gotitas es más grave cuando las condiciones son calurosas y secas.

**Inversiones de temperatura**

No deben realizarse aplicaciones durante una inversión de temperatura debido a que la posibilidad de arrastre es alta. Las inversiones de temperatura restringen la mezcla de aire vertical, lo que causa que pequeñas gotitas suspendidas permanezcan en una nube concentrada. Esta nube puede moverse en direcciones no predecibles debido a los vientos variables leves que son comunes durante las inversiones. Las inversiones de temperatura están caracterizadas por temperaturas en aumento con altitud y son comunes en las noches con cobertura de nubes limitada y poco o ningún viento. Comienzan a formarse cuando se mete el sol y a menudo continúan en la mañana. Su presencia puede indicarse por neblina en el suelo; sin embargo, si la neblina no está presente, las inversiones también pueden identificarse por el movimiento del humo desde una fuente del suelo o por el generador de humo de un aeroplano. El humo en capas que se mueve lateralmente en una nube concentrada (bajo condiciones de poco viento) indica una inversión, mientras que el humo que se mueve hacia arriba y se disipa rápidamente indica buena mezcla de aire vertical.

**Áreas sensibles**

Este producto solo se debe aplicar cuando la posibilidad de arrastre hacia zonas adyacentes susceptibles (como por ejemplo, áreas residenciales, masas de agua, hábitat conocido de especies amenazadas o en peligro de extinción, cultivos que no sean el objetivo) sea mínima (como por ejemplo, cuando el viento sople lejos de las áreas susceptibles).

## 7.2 Equipo de aplicación al voleo terrestre

Para aplicaciones al voleo terrestre, a menos que se indique lo contrario en esta etiqueta, en etiquetas complementarias separadas o en las Fichas Técnicas publicadas por Monsanto, use este producto en una proporción de 1.5 a 3 pintas por acre para malezas anuales, de 3 a 7.5 pintas para malezas perennes y de 3 a 7.5 pintas por acre para matorrales leñosos y árboles. Cuando se usa de acuerdo con las instrucciones de la etiqueta, este producto brinda control total o parcial de las malezas herbáceas, matorrales leñosos y árboles mencionados en la sección **TIPOS DE MALEZAS CONTROLADAS** de esta etiqueta.
Use las proporciones indicadas en la etiqueta de este producto con 3 a 40 galones de agua por acre para aplicaciones al voleo, a menos que se especifique de otra manera en esta etiqueta, en etiquetas complementarias separadas o en las Fichas Técnicas publicadas por Monsanto. A medida que la densidad de las malezas aumenta, el volumen de rocío se debe aumentar también para conseguir una cobertura completa, pero siempre dentro de los límites recomendados. A fin de evitar una niebla muy fina, seleccione la boquilla cuidadosamente. Para obtener mejores resultados con equipo a

nivel del terreno, use boquillas tipo abanico plano. Asegúrese de que las gotas del rocío se distribuyan uniformemente.

## 7.3 Equipo de mano

Aplique al follaje de la vegetación a ser controlada. En aplicaciones de rocío para mojar, la cobertura del rocío debe ser completa y uniforme. No rocíe hasta el punto de escurrimiento. Utilizar sólo rociadores gruesos.

Para el control de las malezas enumeradas en la sección de **Malezas anuales** de la sección **TIPOS DE MALEZAS CONTROLADAS**, aplique una solución al 0.5 por ciento de este producto a las malezas de menos de 6 pulgadas de altura o largo de los tallos. Para malezas anuales de más de 6 pulgadas de altura utilice una solución al 1 por ciento, a menos que se especifique de otro modo. Haga la aplicación antes de la formación de semillas para el pasto, o la formación de brotes para las malezas de hoja ancha.

Para obtener los mejores resultados, utilice una solución al 1.5 por ciento en plantas perennes más difíciles de controlar, enredaderas leñosas, arbustos y árboles. Para obtener mejores resultados, realice aplicaciones en plantas perennes después de la emergencia de las semillas en pastos o la formación de brotes en las malezas de hoja ancha, matorrales leñosos y árboles.

En aplicaciones de rocío dirigido de bajo volumen, use una solución del 4 al 8 por ciento de este producto para el control total o parcial de malezas anuales, malezas perennes o matorrales leñosos y árboles. La cobertura del rocío debe ser uniforme y hacer contacto con al menos el 50 al 75 por ciento del follaje. Es importante lograr la cobertura de la mitad superior de la planta para lograr los mejores resultados. Si se utiliza una boquilla de caudal directo, comience la aplicación en la parte superior de la vegetación que sea el objetivo, y rocíe de arriba hacia abajo con un movimiento de zigzag lateral. Para boquillas cónicas y tipo abanico plano, y con sopladores de vaporización manuales, aplique la niebla sobre el follaje de la vegetación que sea el objetivo. Para asegurar una cobertura de rocío adecuada, rocíe ambos lados de los matorrales leñosos y de los árboles grandes o altos cuando el follaje es espeso y denso o cuando hay varios rebrotes. Para obtener resultados óptimos, aplique este producto a árboles y matorrales leñosos en crecimiento activo después de la expansión completa de las hojas y antes de que éstas adquieran color otoñal y se caigan.

Salvo que se especifique lo contrario, use las proporciones indicadas en la tabla siguiente para diversos métodos de aplicación foliar usando equipo de mano de alto volumen, tipo mochila y similares. Cuando se usa de acuerdo con las instrucciones de la etiqueta, este producto brinda control total o parcial de las malezas herbáceas, matorrales leñosos y árboles mencionados en la sección **TIPOS DE MALEZAS CONTROLADAS** de esta etiqueta.

**PROPORCIONES DE APLICACIÓN**

| APLICACIÓN | | VOLUMEN DE ROCÍO Galones/Acre |
|---|---|---|
| ROCÍO PARA MOJAR | | |
| Pistola de mano o mochila | 0.5 a 1.5% por volumen | rocío para mojar* |
| **ROCÍO DIRIGIDO DE BAJO VOLUMEN** | | |
| Mochila | 4 a 8% por volumen | 15 a 25** |
| Alto volumen modificado | 1.5 a 3% por volumen | 40 a 60** |

* En aplicaciones de rocío para mojar, la cobertura del rocío debe ser completa y uniforme. No rocíe hasta el punto de escurrimiento.

** Las aplicaciones con mochila de rocío dirigido de bajo volumen funcionan mejor para tratar malezas y matorrales de menos de 10 pies de altura. Para malezas y matorrales más altos, las pistolas de mano de alto volumen se pueden modificar reduciendo el tamaño de la boquilla y la presión del rocío para producir un rocío dirigido de bajo volumen.

## 7.4 Equipo selectivo

Este producto puede ser diluido con agua, mezclado bien y aplicado usando rociadores de recirculación, aplicadores con pantalla, rociadores con capucha, aplicadores con enjugador o barras de esponja, sobre las malezas indicadas que crecen en cualquier zona acuática o lugar no cultivado indicado en esta etiqueta.

Los rociadores de recirculación dirigen la solución de rocío hacia los tipos de malezas que crecen sobre vegetación deseable, mientras que la solución de rocío que no ha sido interceptada por las malezas se recoge y retorna al tanque para volverla a usar.

EVITE EL CONTACTO DE ESTE HERBICIDA CON LA VEGETACIÓN DESEABLE, YA QUE ES PROBABLE QUE OCURRA DAÑO GRAVE O MUERTE DE LA VEGETACIÓN.

El equipo de aplicación que se utilice por encima de la vegetación deseable debe ajustarse de manera que el chorro de rocío o punto de contacto del enjugador esté al menos 2 pulgadas por encima de la vegetación deseable. Es probable que las gotas, niebla, espuma o salpicaduras de la solución de herbicida sobre la vegetación deseable provoquen decoloración, atrofia o destrucción.

Se pueden obtener mejores resultados cuando se expone una mayor cantidad de la maleza a la solución de herbicida. Las malezas sin contacto con la solución de herbicida no serán afectadas. Esto puede ocurrir en lugares donde las malezas están muy concentradas, cuando la infestación es grave o donde la altura de las malezas es variada, lo que no permite que todas sean tocadas por el herbicida. En estos casos puede ser necesario repetir el tratamiento.

**Aplicadores con pantalla y con capucha**

Los aplicadores con pantalla o con capucha aplican la solución de herbicida directamente sobre las malezas, al mismo tiempo que protegen la vegetación deseable, para que no sea tocada por el herbicida. Use boquillas que aseguren una cobertura uniforme en toda el área tratada. En los rociadores con pantalla, mantenga las pantallas debidamente colocadas a fin de proteger la vegetación deseada. DEBE TENER SUMO CUIDADO PARA EVITAR EL CONTACTO DE ESTE HERBICIDA CON LA VEGETACIÓN DESEABLE.

**Aplicadores con enjugador y barras de esponja**

Los aplicadores con enjugador son dispositivos que pasan físicamente este producto directamente a la maleza.

El equipo debe ser diseñado, mantenido y operado de manera que la solución de herbicida no haga contacto con la vegetación deseable. Opere este equipo a velocidades inferiores a las 5 millas por hora. En áreas donde la infestación de malezas es grave, se puede mejorar la eficacia reduciendo la velocidad, así se asegura que el enjugador esté siempre adecuadamente saturado. Se obtienen mejores resultados si hacen 2 aplicaciones en direcciones opuestas.

Evite las filtraciones o el goteo en la vegetación deseable. Ajuste la altura de los aplicadores a fin de asegurar un contacto adecuado con las malezas. Mantenga limpias las superficies de enjugado. Tenga en cuenta que, en terreno en declive, la solución de herbicida puede cambiar de lugar, goteando en el extremo inferior y secando las mechas en el extremo superior del aplicador con enjugador.

No use aplicadores con enjugador cuando las malezas estén mojadas.

Mezcle solamente la cantidad de solución que se usará durante el período de un día, debido a que el uso de soluciones de días anteriores puede reducir la eficacia. Inmediatamente después de usar este producto, lave bien las partes del aplicador usando bastante agua.

Se recomienda surfactante no iónico en una proporción del 10 por ciento por volumen de la solución total de herbicida para todas las aplicaciones con enjugador.

**Para aplicadores de cordón o de mecha de esponja** — Pueden emplearse soluciones que oscilen entre 33 al 75 por ciento de este producto en agua.

**Para aplicadores de panel** — Pueden emplearse soluciones que oscilen entre 33 al 100 por ciento de este producto en agua en aplicadores con enjugador de papel.

## 7.5 Sistemas por inyección

Este producto puede usarse con sistemas de rocío por inyección, ya sean aéreos o a nivel del terreno. Puede usarse como concentrado líquido o diluido antes de la inyección en el chorro de rocío. No mezcle este producto con concentraciones de otros productos sin diluir cuando use los sistemas por inyección, a menos que se recomiende de manera específica.

## 7.6 Equipo de aplicación por goteo controlado (CDA)

La proporción de este producto aplicada por acre con el equipo de aplicación por goteo controlado (CDA) no debe ser menos que la cantidad indicada en esta etiqueta cuando se aplica con un equipo al voleo convencional. Cuando se usa el equipo aplicador por goteo controlado montado en un vehículo, use de 2 a 15 galones de agua por acre.

**Para controlar malezas anuales con aplicadores por goteo controlado de mano** — Aplique una solución de este producto al 15 por ciento (19.25 oz de producto por galón) a razón de 2 onzas líquidas por minuto y una velocidad de caminata de 1.5 millas por hora (1 cuarto de galón por acre). Para controlar malezas perennes, aplique una solución de este producto de 15 a 30 por ciento a razón de 2 onzas líquidas por minuto y una velocidad de caminata de 0.75 milla por hora (2 a 4 cuartos de galón por acre).

Los equipos de CDA producen un patrón de rocío que es difícil de ver. Se debe tener especial cuidado para evitar que el rocío o el arrastre entre en contacto con el follaje o cualquier otra parte verde de la vegetación deseable, ya que en caso contrario, es probable que ésta sea dañada o destruida.

# 8.0 RECOMENDACIONES SEGÚN ÁREAS Y USO

Este producto se puede usar para controlar las malezas, los matorrales leñosos y árboles en zonas acuáticas, lugares no cultivados y cultivados mencionados en esta etiqueta.

Los lugares no cultivados incluyen aeropuertos, complejos de viviendas, centros comerciales, acequias, acequias secas, canales secos, cercas, bosques, campos de golf, áreas de restauración y manejo de hábitats, terrenos industriales, depósitos de madera, zonas de manufactura, solares municipales, zonas naturales, complejos de oficinas, áreas públicas, parques, áreas de estacionamiento, pasturas, zonas con tanques de petróleo e instalaciones de bombeo, vías de ferrocarril, tierras de pastoreo, áreas recreativas, áreas residenciales, bordes de carreteras, escuelas, áreas de almacenamiento, subestaciones, derechos de paso de servicios públicos, zonas de servicios públicos, zonas de almacenes y zonas de manejo de vida silvestre.

Cultivos incluye cítricos, caña de azúcar, césped, tepes y barbecho vegetal.

A menos que se especifique de otra manera en esta etiqueta, en etiquetas complementarias separadas o en las Fichas Técnicas publicadas por Monsanto, pueden realizarse aplicaciones para controlar cualquier maleza indicada en las tablas de proporciones de **Malezas anuales, Malezas perennes, Matorrales leñosos** y **árboles**. Consulte también la sección sobre **Equipo selectivo**.

## 8.1 Zonas acuáticas

Este producto se puede aplicar a malezas emergidas en todas las masas de agua fresca o salobre, que pueden ser fluyentes, no fluyentes o intermedias. Esto incluye lagos, ríos, arroyos, estanques, estuarios, diques de arroz, filtraciones, acequias de irrigación y drenaje, canales, embalses, instalaciones de tratamiento de aguas residuales, zonas de restauración y manejo de hábitats de vida silvestre.

Si hay zonas acuáticas en el área y éstas son parte del tratamiento deseado, lea y siga estas instrucciones:

**Este producto no proporciona control de plantas completamente sumergidas o que tengan la mayor parte de su follaje bajo agua.**

No hay restricciones sobre el uso de agua tratada con propósitos domésticos, de irrigación o recreación.

Consulte su agencia local de caza y pesca y las autoridades de control de aguas antes de aplicar el producto en aguas públicas. Pueden requerirse permisos para tratar estas aguas.

**NOTA:** No aplique este producto **directamente al agua** dentro de 0.5 millas aguas arriba de una entrada activa de agua potable en agua fluyente (ej., río, arroyo, etc.) o dentro de 0.5 millas aguas arriba de una entrada de agua potable en una masa de agua estancada como un lago, estanque o embalse. Para hacer aplicaciones acuáticas alrededor y dentro de 0.5 millas de las entradas activas de agua potable, hay que cerrar la entrada de agua por un período mínimo de 48 horas después de la aplicación. La entrada de agua puede abrirse antes de las 48 horas si el nivel de glifosato en el agua de entrada es menos de 0.7 partes por millón según se determine por análisis de laboratorio. Estas aplicaciones acuáticas SOLAMENTE pueden hacerse si existen fuentes de aguas alternas o estanques de retención que permitan el cierre de una entrada activa de agua potable por un período mínimo de 48 horas después de la aplicación. Esta restricción **NO** aplica al rocío excesivo intermitente e involuntario de agua en aplicaciones terrestres.

Para aplicaciones después de interrumpir el suministro de agua o en acequias secas, espere 7 días o más después del tratamiento antes de restaurar el agua para obtener un control máximo de las malezas. Aplique este producto 1 día después de interrumpir el suministro de agua para asegurar la aplicación en las malezas con crecimiento activo.

Puede ser necesario repetir las aplicaciones en las masas flotantes de vegetación. Evite que la lluvia o la estela de barcos fumigadores o recreativos laven el follaje tratado hasta después de 6 horas de la aplicación. No repita la aplicación antes de 24 horas de la aplicación inicial.

La aplicación a masas de agua en movimiento deberá hacerse mientras se viaja corriente arriba para evitar la concentración de este herbicida en el agua. Al hacer aplicaciones en las riberas, no traslape más de 1 pie en aguas abiertas. No rocíe en masas de agua donde no existan malezas. No se puede exceder la proporción máxima de aplicación de 7.5 pintas por acre en una aplicación al voleo sobre agua, con las siguientes excepciones, donde se puede aplicar cualquier cantidad indicada en la etiqueta:

- Cruces de arroyos en servidumbres de servicios públicos.
- Si las aplicaciones se limitan a menos del 20 por ciento del área total de agua tratada.

Cuando las infestaciones emergidas requieren tratamiento de la superficie total del agua embalsada, hacer las aplicaciones por franjas puede evitar la disminución de oxígeno debido a la descomposición de la vegetación. La disminución de oxígeno puede causar la muerte de los peces.

**Para controlar el cordgrass (*espartina*)**

La presencia de desechos y cieno en la superficie de las plantas de cordgrass (espartina) reducirá el rendimiento del producto. Puede ser necesario lavar las plantas que sean el objetivo antes de la aplicación para mejorar la absorción del herbicida. Donde el cordgrass haya sido cortado o segado antes de la aplicación, permita que vuelva a crecer bastante antes de aplicar para asegurar una intercepción y absorción adecuadas de la solución herbicida. La lluvia antes de transcurridas 2 horas o la inmersión antes de transcurridas 4 horas de la aplicación pueden reducir la eficacia.

Antes de la aplicación, inspeccione las zonas a tratar para determinar si existen bancos de mariscos dentro de la zona de tratamiento deseado. Espere hasta la recolección de los mariscos para hacer la aplicación o no recolecte los mariscos hasta pasados 14 días después de la aplicación.

Agregue de 1 a 2 cuartos de galón o más de surfactante no iónico u otro adyuvante para usar en zonas acuáticas y que sea compatible con este producto, por 100 galones de solución de rocío para aplicaciones al voleo (terrestres o aéreas) y cuando use equipo de aplicación con sensores ópticos.

No use ningún sistema de irrigación para aplicar este producto.

**APLICACIÓN**

En condiciones ideales de aplicación, esto es, cuando no haya desechos ni cieno en la superficie de las plantas, se pueda lograr una buena cobertura de rocío, las plantas que sean el objetivo estén en crecimiento activo y se usen los volúmenes de aplicación y las proporciones recomendadas en la etiqueta, permita un tiempo de secado de por lo menos 4 horas antes de que la marea cubra las plantas. Si no se cumple alguna de estas condiciones, programe las aplicaciones para permitir un tiempo de secado de por lo menos 5 horas antes de que la marea cubra las plantas. No lo aplique cuando la velocidad del viento en el lugar de la aplicación exceda las 10 millas por hora.

Aplicación al voleo (Terrestre): Aplique de 2 a 8 cuartos de galón de este herbicida en 5 a 100 galones de solución de rocío por acre. Para obtener los mejores resultados, se requiere cubrir por completo las concentraciones de cordgrass.

Aplicación al voleo (Terrestre/Equipo de aplicación con sensor óptico): Aplique de 2 a 8 cuartos de galón de este producto en 5 a 100 galones de solución de rocío por acre usando equipo diseñado y calibrado para solución de rocío solo cuando existan plantas de cordgrass y se detecten con los sensores ópticos. Para obtener los mejores resultados, se requiere cubrir por completo las concentraciones de cordgrass.

Mochila de mano o equipo de alto volumen: Aplique una solución de 5 a 8 por ciento de este producto. Asegúrese de obtener una cobertura completa de las concentraciones de cordgrass. No rocíe hasta el punto de escurrimiento.

Aplicación al voleo (Aérea): Aplique de 2 a 8 cuartos de galón de este herbicida en 5 a 10 galones de solución de rocío por acre. Mantenga una zona de transición de por lo menos 50 pies entre los bancos comerciales de mariscos y las zonas tratadas. La posibilidad de arrastre del rocío depende de factores relacionados con el clima y con el equipo. Las personas que aplican el producto deben estar familiarizadas con los modelos locales de vientos, observar y registrar la temperatura y la velocidad del viento antes de la aplicación y periódicamente durante la misma. Programe la aplicación para permitir por lo menos 5 horas antes de que la marea cubra las plantas tratadas.

**Para aplicación foliar y al voleo en knotweed (polígono) japonés**

Para controlar el knotweed (*polígono*) japonés (*Polygonum cuspidatum*), este producto puede aplicarse como una solución de rocío para mojar al 2.0% v/v con 0.5 a 2.0% v/v de un surfactante no iónico que contenga por lo menos 70% de ingrediente activo. Asegúrese de lograr una cobertura completa cuando efectúe tratamientos de rocío para mojar mediante un equipo de mano.

Para aplicaciones al voleo, aplique 3 cuartos de galón de este producto con un sistema surfactante acuático aprobado que contenga 0.1% v/v de organosilicona no iónica y 0.25% v/v de surfactante no iónico adhesivo dispersante en 3 a 40 galones por acre como aplicación al voleo.

Deje pasar por lo menos 3 días antes de remover la vegetación tratada. Este producto no proporciona control de plantas completamente sumergidas o que tengan la mayor parte de su follaje bajo agua.

**Para aplicación foliar y al voleo en Oriental bittersweet**

Para controlar el Oriental bittersweet (*Celastrus orbiculatus*), este producto puede aplicarse como una solución de rocío para mojar al 2.0% v/v con 0.5 a 2.0% v/v de un surfactante no iónico que contenga por lo menos 70% de ingrediente activo. Asegúrese de lograr una cobertura completa cuando efectúe tratamientos de rocío para mojar mediante un equipo de mano.

Para aplicaciones al voleo, aplique 2.25 cuartos de galón de este producto con un sistema surfactante acuático aprobado que contenga 0.1% v/v de organosilicona no iónica y 0.25% v/v de surfactante no iónico adhesivo dispersante en 3 a 40 galones por acre como aplicación al voleo.

Deje pasar por lo menos 3 días antes de remover la vegetación tratada. Este producto no proporciona control de plantas completamente sumergidas o que tengan la mayor parte de su follaje bajo agua.

**Mezclas de tanque**

Se pueden usar mezclas de tanque de este producto más 2,4-D amina para aumentar el espectro de vegetación controlada en zonas acuáticas. Use de 1.5 a 2 pintas de este producto más 1 a 2 cuartos de galón de 2,4-D amina (4 libras de ingrediente activo por galón, aprobado para zonas acuáticas) para controlar las malezas anuales. Use de 3 a 7.5 pintas de este producto más 2 a 4 cuartos de galón de 2,4-D amina (4 libras de ingrediente activo por galón, aprobado para zonas acuáticas) para controlar total o parcialmente las malezas perennes, matorrales leñosos y árboles.

Cuando haga mezclas de tanque, lea y siga cuidadosamente las instrucciones de la etiqueta, las declaraciones preventivas y toda la información contenida en las etiquetas de todos los productos utilizados. Use conforme a las precauciones más restrictivas de cada producto en la mezcla. Mezcle en el orden siguiente: Llene de agua hasta la mitad el tanque rociador, agregue Roundup Custom para uso acuático y terrestre, luego 2,4-D amina y finalmente el surfactante. Termine de llenar con agua el tanque rociador hasta el volumen final.

**NOTA:** NO MEZCLE LOS CONCENTRADOS DE ROUNDUP CUSTOM PARA USO ACUÁTICO Y TERRESTRE Y 2,4-D AMINA SIN AGUA COMO SUSTANCIA PORTADORA. NO MEZCLE LOS CONCENTRADOS DE ROUNDUP CUSTOM PARA USO ACUÁTICO Y TERRESTRE Y 2,4-D AMINA EN EL EQUIPO ROCIADOR TIPO INYECTOR DE RETORNO.

## 8.2 Tocones cortados

El tratamiento de tocones cortados puede hacerse en cualquier área que se indique en esta etiqueta. Este producto controla muchas especies de matorrales leñosos y árboles. Aplique este producto utilizando el equipo apropiado para asegurar la cobertura total del cámbium. Corte los árboles o sus brotes cerca de la superficie del suelo. Aplique una solución de este producto de 50 a 100 por ciento a la superficie recientemente cortada **inmediatamente después** del corte. La demora en la aplicación puede causar un rendimiento inferior. Para obtener los mejores resultados, las aplicaciones deben realizarse durante los períodos de crecimiento activo y de expansión completa de las hojas.

Para controlar el (Árbol del cielo) *Ailanthus altissima*, haga una aplicación sobre tocones cortados de acuerdo con las instrucciones en esta sección usando una mezcla de rocío de 50% de Roundup Custom para uso acuático y terrestre y 10% de Arsenal.

NO HAGA LAS APLICACIONES SOBRE TOCONES CORTADOS CUANDO LAS RAICES DE LOS MATORRALES LEÑOSOS O ÁRBOLES DESEABLES PUEDEN ESTAR INJERTADAS A LAS RAICES DE LOS TOCONES CORTADOS. Algunos retoños, tallos o árboles pueden compartir el mismo sistema de raíces. Los árboles adyacentes de edad, altura y espaciado similares pueden tener raíces compartidas. Ya sean injertados o compartidos, es probable que se dañen tallos/árboles no tratados cuando se tratan uno o más árboles que comparten raíces entre sí.

## 8.3 Zonas de liberación herbácea y de coníferas

Este producto se puede usar para liberación de coníferas como rocío al voleo para control total o parcial o supresión de malezas herbáceas y árboles de madera dura indicados en la sección **TIPOS DE MALEZAS CONTROLADAS** de esta etiqueta. Úselo solamente en áreas donde se han establecido coníferas por más de un año, a menos que se indique lo contrario abajo. Este producto se puede aplicar como rocío directo o usando equipo

selectivo en lugares de coníferas y árboles de madera dura para forestación, incluyendo plantaciones de árboles de Navidad y viveros dedicados a la silvicultura.

Utilice un surfactante no iónico que esté indicado para aplicaciones desde arriba en liberación de coníferas. Consulte las dosis y otras declaraciones preventivas en la etiqueta del fabricante del surfactante. Si utiliza este producto sin un surfactante se reducirá el rendimiento del herbicida.

**LA APLICACIÓN SE DEBE REALIZAR DESPUÉS DE LA FORMACIÓN DE LOS BROTES FINALES DE LAS CONIFERAS EN OTOÑO O ANTES DE COMENZAR LA HINCHAZÓN DE LOS BROTES EN PRIMAVERA.**

Puede ocurrir daño a las coníferas tratadas para liberación, particularmente donde se superponen los patrones de rocío o se aplican las dosis más altas. El daño puede agravarse si se hacen las aplicaciones cuando las coníferas están en crecimiento activo, o cuando están en condiciones de estrés por sequía, inundaciones, siembra incorrecta, insectos, enfermedades o daño por animales.

**Para liberación de las siguientes especies de coníferas fuera del sudeste de los Estados Unidos:**

**Douglas Fir, Abeto (Fir), Hemlock, Pinos*, Secuoya (Redwood) de California, Spruce**

* Incluye todas las especies, con excepción de los pinos Loblolly, de hoja larga, de hoja corta o Slash.

Utilice de 1.5 a 3 pintas de este producto por acre como rocío al voleo.

Para liberación de Douglas Fir y especies de pino y spruce (abeto falso) al finalizar la primera temporada de crecimiento (excepto en California), este producto se puede usar en las proporciones más bajas indicadas de 1.5 a 2.5 pintas por acre. Antes de aplicar, asegúrese de que las coníferas se hayan endurecido bien. Antes de usarlo, asegúrese de que se haya probado bien el uso seguro del surfactante no iónico en el Douglas Fir.

Para liberación del Spruce (*especies de abeto falso*) en Maine, Michigan, Minnesota, New Hampshire y Wisconsin, se pueden usar hasta 4.5 pintas por acre de este producto para el control de especies de árboles y matorrales leñosos difíciles de controlar, y se debe aplicar después de la formación de los brotes finales de las coníferas en el otoño.

No se recomienda el uso de un surfactante para la liberación de especies de Hemlock o de Secuoyas de California. Si se usa un surfactante en grupos mezclados de coníferas se puede causar daño a estas especies.

**Para liberación de las siguientes especies de coníferas en el sudeste de los Estados Unidos:**

**Pino Loblolly, pino Slash, pino blanco del este, pino de Virginia, pino de hoja corta, pino de hoja larga**

Aplique de 2.25 a 3.75 pintas de este producto por acre como rocío al voleo durante finales del verano o comienzos de otoño después que los pinos se hayan endurecido.

Si realiza aplicaciones a finales de la primera temporada de crecimiento, use 1.5 pintas por acre de este producto.

MEZCLAS DE TANQUE: Este producto se puede mezclar en tanque con los siguientes productos para liberación herbácea y de coníferas. Cuando prepare mezclas de tanque, lea y siga cuidadosamente las instrucciones de la etiqueta, las declaraciones preventivas y toda la información contenida en las etiquetas de todos los productos utilizados. Utilice conforme con las declaraciones preventivas más restrictivas de cada producto en la mezcla.

Cuando se aplica según las instrucciones, este producto más los herbicidas residuales indicados brindan control post emergencia de las malezas anuales y control o supresión de las malezas perennes indicadas en esta etiqueta, y control residual de las malezas indicadas en la etiqueta del herbicida residual. Úselo solamente en las especies de coníferas indicadas en la etiqueta de ambos productos para rocío desde arriba.

atrazine
Arsenal Applicator Concentrate
Oust XP

**Finales de verano y otoño, después de la formación de brotes latentes**

Para la liberación de pino jack, pino blanco y spruce blanco, aplique de 1.5 a 3 pintas de este producto, más de 1 a 3 onzas de Oust XP por acre. Para pino blanco, prepare una mezcla de tanque con 1 a 1.5 onzas de Oust XP por acre.

Para liberación de coníferas de Douglas fir, utilice de 1.5 a 2.25 pintas de este producto, más de 2 a 6 onzas de concentrado para aplicadores Arsenal por acre. Para liberación de coníferas de balsam fir (abeto de Navidad) y red spruce, utilice 3 pintas de este producto, más de 1 a 2.5 onzas de concentrado para aplicadores Arsenal por acre.

**Liberación herbácea**

Para liberación herbácea en primavera y principios de verano de pino loblolly, pino de Virginia y pino de hoja larga, aplique de 12 a 18 onzas líquidas de este producto con 2 a 4 onzas de Oust XP.

Para liberación de Douglas fir a comienzos de primavera, antes de la hinchazón de los brotes, aplique 1.5 pintas de este producto, más 4 libras del ingrediente activo de atrazine por acre. Deje pasar una temporada de crecimiento completa antes de la aplicación. No agregue surfactantes a este tratamiento.

## 8.4 Preparación del lugar para forestación

Este producto puede ser utilizado para controlar total o parcialmente matorrales leñosos, árboles y malezas herbáceas en forestaciones, y preparar o crear claros para la vida silvestre en estos lugares y para mantener los caminos de las explotaciones forestales.

Este producto puede ser utilizado para preparar el lugar antes de plantar cualquier especie de árbol, como árboles de Navidad, eucaliptos, cultivos de árboles híbridos y viveros dedicados a la silvicultura.

Para aplicaciones usando diferentes tipos de equipos, consulte la tabla de PROPORCIONES DE APLICACIÓN en la sección **EQUIPO DE MANO** de esta etiqueta.

MEZCLAS DE TANQUE: Se pueden usar mezclas de tanque de este producto para aumentar el espectro de vegetación controlada en la preparación del lugar para forestación. Cuando prepare mezclas de tanque, lea y siga cuidadosamente las instrucciones de la etiqueta, las declaraciones preventivas y toda la información contenida en las etiquetas de todos los productos utilizados. Use conforme a las precauciones más restrictivas de cada producto en la mezcla.

**NOTA:** Para la preparación del lugar para forestación, asegúrese de que el producto para mezclar en tanque esté aprobado antes de plantar las especies deseadas. Respete las restricciones del intervalo de plantación.

Todas las proporciones recomendadas de este producto se pueden utilizar en una mezcla de tanque con los siguientes productos para la preparación de sitios de forestación.

| | |
|---|---|
| Arsenal Applicators Concentrate | Garlon 3A |
| Chopper | Garlon 4 |
| Chopper GEN2 | Oust XP |
| Escort | |

Para el control de malezas herbáceas, use las proporciones de mezcla de tanque más bajas. Para controlar grupos densos o difíciles de matorrales leñosos y árboles, utilice las proporciones de mayor concentración recomendadas en mezcla de tanque.

**A menos que se especifique de otra manera en esta etiqueta, en etiquetas complementarias separadas o fichas técnicas publicadas por Monsanto, no aplique este producto como rocío desde arriba para liberación herbácea y de coníferas para forestación.**

## 8.5 Áreas no cultivadas y áreas industriales

Aplique en áreas como aeropuertos, complejos de viviendas, centros comerciales, acequias, acequias secas, canales secos, cercas, bosques, campos de golf, terrenos industriales, depósitos de madera, zonas de manufactura, complejos de oficinas, parques, áreas de estacionamiento, zonas con tanques de petróleo e instalaciones de bombeo, vías de ferrocarril, áreas recreativas, áreas residenciales, bordes de carreteras, granjas de semillas de césped o tepes, escuelas, áreas de almacenamiento, subestaciones, zonas de servicios públicos, zonas de almacenes y zonas de manejo de vida silvestre.

**Control general de malezas, recortado de bordes y suelo limpio de malezas**

Este producto se puede usar en lugares no cultivados. Puede aplicarse con cualquiera de los equipos descritos en esta etiqueta. Este producto puede usarse para el recortado de bordes alrededor de objetos, para tratamiento localizado de vegetación no deseable y para eliminar las malezas no deseables que crecen en lechos de arbustos establecidos y plantaciones ornamentales. Este producto puede usarse antes de plantar un área con plantas ornamentales, flores, césped (tepes o semillas), o antes de colocar asfalto o de comenzar un proyecto de construcción.

Repita las aplicaciones de este producto según emerjan las malezas para mantener el suelo vacío.

MEZCLAS DE TANQUE: Este producto puede ser mezclado en el tanque con los productos siguientes.

| | | |
|---|---|---|
| Arsenal | Garlon 3A | Ronstar 50WP |
| atrazine* | Garlon 4 | simazine* |
| Barricade 65WG | Goal 2XL | Surflan AS |
| Certainty | Krovar I DF | Surflan WDG |
| Crossbow L | Landmark II | Telar DF |
| dicamba* | Landmark II MP | Transline |
| diuron* | Outrider | Velpar DF |
| Endurance | Oust XP | Velpar L |
| Escort XP | Plateau | 2,4-D* |
| Gallery 75DF | Poast | |

*El usuario es responsable de asegurarse de que las mezclas de tanque con productos que contienen este ingrediente activo genérico pueden realizarse siempre y cuando dichos productos estén aprobados para su aplicación.

No aplique mezclas con dicamba por aire en California. Solo se pueden utilizar formulaciones de 2,4-D amina para la aplicación aérea en California.

**Mezclas de tanque para control de matorrales**

MEZCLAS DE TANQUE: Se pueden usar mezclas de tanque de este producto para aumentar el espectro de control para malezas herbáceas, matorrales leñosos y árboles. Cuando prepare mezclas de tanque, lea y siga cuidadosamente las instrucciones de la etiqueta, las declaraciones preventivas y toda la información contenida en las etiquetas de todos los productos utilizados. Use conforme a las declaraciones preventivas más restrictivas de cada producto en la mezcla. Para la mezcla de tanque, puede utilizarse cualquier cantidad de este producto que se encuentre dentro del rango indicado en la etiqueta.

Para el control de malezas herbáceas, use las proporciones dosis más bajas de mezcla de tanque. Para controlar grupos densos o difíciles de matorrales leñosos y árboles, utilice las proporciones más altas recomendadas.

**NOTA:** Para el tratamiento de recorte lateral, este producto puede utilizase solo o en una mezcla de tanque con Garlon 4.

| | |
|---|---|
| Arsenal | Garlon 3A |
| Escort XP | Garlon 4 |

**Segado químico – Perennes**

Este producto inhibe los pastos perennes indicados en esta sección y sirve como sustituto de la siega. Utilice 6 onzas líquidas de este producto por acre para el tratamiento de festuca alta, festuca fina, orchardgrass, quackgrass o reed canarygrass. Utilice 5 onzas líquidas de este producto por acre para el tratamiento del Kentucky bluegrass. Aplique los tratamientos en 10 a 40 galones de solución de rocío por acre. Aplique después que los pastos hayan alcanzado el 75 por ciento del color verde en primavera o de 7 a 10 días después de cortado cuando haya suficiente recrecimiento para proporcionar una altura deseable para regular el crecimiento.

Use solo en lugares donde se puede tolerar cierto daño o decoloración temporal en pastos perennes.

**Segado químico – Plantas anuales**

Para suprimir el crecimiento de algunos pastos anuales, tales como ryegrass, cebada silvestre y avena silvestre que crecen en céspedes agrestes al borde de las carreteras u otras áreas industriales, aplique de 3 a 4 onzas líquidas de este producto en 10 a 40 galones de solución de rocío por acre. Las aplicaciones se deben realizar cuando los pastos anuales crezcan activamente y antes de que las cabezuelas se encuentren en la etapa de bota del desarrollo. Los tratamientos pueden perjudicar los pastos deseables.

**Césped latente (durmiente)**

Use este producto para controlar o suprimir muchas malezas anuales de invierno y festuca alta para la liberación eficaz de céspedes de bermudagrass y bahiagrass durmientes. Trate solamente cuando el césped esté durmiente y antes de reverdecer en la primavera.

Aplique de 6 a 48 onzas líquidas de este producto por acre. Aplique las proporciones recomendadas en 10 a 40 galones de agua por acre. Úselo solamente en áreas donde el bermudagrass o bahiagrass son deseables y en las que puede tolerarse un poco de daño o decoloración.

Los tratamientos en exceso de 12 onzas líquidas por acre, pueden dañar o retrasar el reverdecer en las áreas donde se hace mucho mantenimiento, como campos de golf y jardines. NO aplique mezclas de tanque de este producto más Oust XP u Outrider en áreas de césped donde se hace mucho mantenimiento. Para otros usos, vea la sección **BORDES DE LAS CARRETERAS** de esta etiqueta, que ofrece las proporciones para tratamientos de bermudagrass y bahiagrass latentes.

**Bermudagrass de crecimiento activo**

Este producto puede usarse para controlar total o parcialmente muchas malezas anuales y perennes para liberación eficaz de bermudagrass en crecimiento activo. NO aplique más de 12 onzas líquidas de este producto por acre en áreas de céspedes de alto mantenimiento. NO aplique mezclas de tanque de este producto más Oust XP u Outrider en áreas de césped donde se hace mucho mantenimiento. Para otros usos, vea la sección **BORDES DE LAS CARRETERAS** de esta etiqueta, que ofrece las proporciones para tratamientos de bermudagrass de crecimiento activo. Utilícelo solo en áreas donde puede tolerarse algún daño temporal o descoloración.

**Renovación del césped, producción de semillas o tepes**

Este producto controla la mayoría de la vegetación existente antes de la renovación del césped o de establecer céspedes cultivados para semilla o tepes. Para un control máximo de la vegetación existente, demore la siembra o cobertura de césped a fin de determinar si las partes de la planta que quedaron bajo tierra vuelven a crecer. Cuando sea necesario repetir el tratamiento, permita que las plantas se desarrollen lo suficiente antes de volver a tratar. Para controlar más eficientemente los pastos de estación cálida, como bermudagrass, se debe aplicar este producto en el verano o en el otoño. En lugares donde la vegetación existente esté creciendo y el césped esté bajo un programa de siega, aplique este producto después de omitir por lo menos un corte del césped para permitir un crecimiento suficiente a fin de que el rocío sea interceptado por las plantas.
No remueva la tierra ni las partes de la planta que estén bajo tierra antes del tratamiento. La labranza o las técnicas de renovación como corte vertical, perforación o rebanado deben esperar 7 días después de la aplicación a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra.
Pueden sembrarse los céspedes deseados siguiendo los procedimientos anteriormente mencionados.
Puede utilizarse equipo de mano para el tratamiento en sitio de vegetación no deseada que crezca en el césped existente. Puede utilizarse equipo al voleo o de mano para controlar los restos de tepes u otra vegetación no deseada después de cosechar el tepe. No utilice el césped que se cultiva para la producción de semillas o tepes para alimentar animales durante 8 semanas después de la aplicación.

## 8.6 Manejo del hábitat

**Restauración y mantenimiento de hábitats**

Utilice este producto para controlar la vegetación exótica y otro tipo de vegetación no deseada en zonas naturales y donde se realiza manejo del hábitat, incluyendo zonas de estuarios y riberas, tierras de pastoreo y refugios para la vida silvestre. Pueden hacerse aplicaciones para permitir la recuperación de las especies de plantas nativas, antes de plantar dichas especies nativas deseables, y para otros requisitos similares de control de la vegetación de amplia efectividad. A fin de eliminar selectivamente ciertas plantas indeseables, se pueden hacer aplicaciones localizadas para controlar y mejorar el hábitat.

**Parcelas para alimento de la vida silvestre**

Este producto se puede utilizar como tratamiento a fin de preparar el lugar antes de sembrar parcelas para alimento de la vida silvestre. Después de aplicar este producto se puede sembrar cualquier especie de alimento para la vida silvestre o se puede permitir la repoblación de la zona con especies nativas. Si debe labrar para preparar un semillero, deje transcurrir 7 días de la aplicación antes de hacerlo a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra.

## 8.7 Inyección de tallos huecos

Aplique este producto a través de dispositivos de inyección manuales para administrar las cantidades recomendables de este producto a las plantas con tallo hueco identificadas que crecen en cualquiera de los lugares acuáticos o no cultivados especificados en esta etiqueta. Para el control de las siguientes plantas de tallo hueco, utilice según las instrucciones más abajo:

**Castorbean** (*Ricinus communis*)
Inyecte 4 ml por planta de este producto en la parte inferior del tallo principal.

**Hemlock, Poison** (*Conium maculatum*)
Inyecte una caña de una hoja por planta 10 a 12 pulgadas por encima de la corona de la raíz con 5 ml de una solución al 5% v/v de este producto.

**Hogweed, Giant** (*Heracleum mantegazzianum*)
Inyecte una caña de una hoja por planta 12 pulgadas por encima de la corona de la raíz con 5 ml de una solución al 5% v/v de este producto.

**Horsetail, Field** (*Equisetum arvense*)
Inyecte un segmento por encima de la corona de la raíz con 0.5 ml de este producto por tallo. Use una jeringa pequeña que pueda medir esa dosis.

**Iris, Yellow Flag** (*Iris Pseudocorus*)
Use una tijera de podar para cortar los tallos de las flores de 8 a 9 pulgadas por encima de la corona de la raíz. Utilice una aguja hueca que se introduce en el centro del tallo y luego se extrae lentamente a medida que inyecta 0.5 ml de este producto en cada tallo.

**Knotweed, Bohemian** (*Polygonum bohemicum*), **Knotweed, Giant** (*Polygonum sachalinense*), and **Knotweed, Japanese** (*Polygonum cuspidatum*)
Inyecte 5 ml por tallo de este producto en el segundo o tercer entrenudo.

**Reed, Common** (*Phragmites australis*)
Inyecte 5 ml por tallo de una solución al 50% de este producto en el segundo o tercer internudo o en tallos recién cortados.

**Reed, Giant** (*Arundo donax*)
Inyecte 6 ml por tallo de este producto en el segundo o tercer entrenudo.

**Thistle, Canada** (*Cirsium arvense*)
Use una tijera de podar para cortar de 8 a 9 de las plantas más altas en la etapa de brotación. Utilice una aguja hueca que se introduce en el centro del tallo y luego se extrae lentamente a medida que inyecta 0.5 ml de este producto en cada tallo.

**NOTA:** Basándose en la dosis máxima de uso anual de glifosato para estas áreas no cultivadas, el total combinado para todas las aplicaciones no debe exceder los 8 cuartos de galón de este producto por acre. A razón de 5 ml por tallo, 8 cuartos de galón deben tratar aproximadamente 1500 tallos.

## 8.8 Inyección y chorro (matorrales leñosos y árboles)

Este producto puede aplicarse por inyección o chorro para el control total o parcial de matorrales leñosos y árboles. Aplique este producto usando equipo adecuado, que debe ser capaz de penetrar en el tejido viviente. Aplique el equivalente a 1 ml de este producto por cada 2 ó 3 pulgadas de diámetro del tronco a la altura del pecho (DBH en inglés). La mejor forma de hacerlo es aplicando una solución a una concentración del 50 al 100 por ciento de este producto, con un chorro continuo alrededor del árbol o en cortes espaciados uniformemente alrededor del árbol y por debajo del nivel de las ramas. A medida que el diámetro del árbol aumenta, se obtienen mejores resultados con el chorro continuo alrededor del árbol o en cortes espaciados muy cerca entre sí alrededor del árbol. Evite las aplicaciones que permiten el escurrimiento de material cuando se chorrea alrededor del árbol o sobre los cortes en árboles que tienen la facilidad de exudar savia de los cortes. En especies de este tipo, haga los cortes de manera oblicua a fin de producir el efecto de copa y use el producto a una concentración del 100 por ciento. Para obtener mejores resultados, la aplicación debe tener lugar durante períodos de crecimiento activo y después de la expansión completa de las hojas.

## 8.9 Plantas ornamentales, viveros y árboles de Navidad

**Post-dirigido y recortado de bordes**

Este producto se puede utilizar como un rocío post-dirigido alrededor de especies ornamentales leñosas establecidas, como arborvitae, azalea, boj, manzano silvestre, eucalipto, evónimo, abeto, douglas fir, jojoba, acebo (hollies), lilo, magnolio, arce, roble, álamo, alheña, pino, spruce y tejo. Este producto también se puede utilizar para

recortado de bordes alrededor de árboles, edificios, aceras y carreteras, plantas en macetas y otros objetos de viveros.

Las plantas deseables se pueden proteger de la solución de rocío usando pantallas o cubriéndolas con cartón o con algún otro material impermeable. ESTE PRODUCTO NO SE RECOMIENDA PARA ROCIARSE DESDE ARRIBA SOBRE PLANTAS ORNAMENTALES Y ÁRBOLES DE NAVIDAD. Se debe tener mucho cuidado para que el rocío, arrastre o niebla de este producto no hagan contacto con el follaje o la corteza de las especies ornamentales establecidas.

**Preparación del terreno**

Este producto puede usarse antes de plantar cualquier tipo de planta ornamental, de vivero o árboles de Navidad.

**Aplicaciones con enjugador**

Este producto se puede usar mediante aplicadores de mecha de esponja u otro tipo de aplicadores con enjugador adecuados, para controlar total o parcialmente la vegetación indeseable alrededor de eucaliptos o álamos establecidos. Consulte la sección **Equipo selectivo** de esta etiqueta para obtener mayor información sobre el uso adecuado de los aplicadores con enjugador.

**Invernaderos/cobertizos**

Este producto se puede usar para controlar las malezas que estén creciendo en o alrededor de los invernaderos y cobertizos. No debe haber vegetación deseable durante la aplicación y los equipos de ventilación deben estar apagados.

## 8.10 Parques, áreas recreativas y residenciales

Todas las instrucciones de la sección **Áreas no cultivadas y Áreas industriales** son válidas para los parques y áreas recreativas.

Este producto se puede usar en parques, áreas recreativas y residenciales. Puede aplicarse con cualquiera de los equipos descritos en esta etiqueta para recortado de bordes alrededor de árboles, cercas y caminos, alrededor de edificios, aceras y otros objetos en estos lugares. Este producto puede usarse para tratamiento localizado de vegetación no deseable o para eliminar las malezas no deseables que crecen en lechos de arbustos establecidos y plantaciones ornamentales. Este producto puede usarse antes de sembrar un área con plantas ornamentales, flores, césped (tepes o semillas), o antes de colocar asfalto o de comenzar un proyecto de construcción.

## 8.11 Vías de ferrocarril

Todas las instrucciones de la sección **Áreas no cultivadas y Áreas industriales** son válidas para las vías de ferrocarril.

**Suelo vacío, balastos y bordes, cruces y tratamiento localizado**

Este producto puede usarse para mantener el suelo limpio de malezas en balastos y bordes de las vías de ferrocarril. Repita las aplicaciones de este producto según emerjan las malezas para mantener el suelo vacío. Este producto puede usarse para controlar las malezas altas y mejorar la línea visual en los cruces de ferrocarril y reducir la necesidad de segar a lo largo de las servidumbres de vía. Para aplicaciones en los cruces, pueden usarse hasta 80 galones de solución de rocío por acre.

MEZCLAS DE TANQUE: Este producto se puede mezclar en un tanque con los siguientes productos para tratamientos en balasto, bordes, tratamiento cruzado y suelo limpio, siempre que éstos estén aprobados para el área de uso deseada.

| | | |
|---|---|---|
| Arsenal | Hyvar X-L | Spike 80DF |
| atrazine* | Krovar I DF | Telar DF |
| dicamba* | Oust XP | Transline |
| Escort XP | Outrider | Velpar DF |
| Garlon 3A | Sahara DG | Velpar L |
| Garlon 4 | simazine* | 2,4-D* |
| Hyvar X | | |

*Pueden realizarse mezclas de tanque con productos que contengan este ingrediente activo siempre y cuando dichos productos estén aprobados para su aplicación. El usuario es responsable de garantizar que en la etiqueta del producto utilizado en la mezcla estén permitidas las aplicaciones específicas cuando se realicen mezclas de tanque con un ingrediente activo genérico.

**Control de matorrales**

Este producto se puede usar para controlar matorrales leñosos y árboles en las servidumbres de vías de ferrocarril. Aplique de 3 a 8 cuartos de galón de este producto por acre para aplicaciones diseminadas, usando boquillas tipo brazo o sin brazo. Pueden usarse hasta 80 galones de solución de rocío por acre. Aplique una solución de 0.75 a 1.5 por ciento de este producto cuando haga aplicaciones de rocío para mojar del alto volumen. Aplique una solución de 4 a 8 por ciento de este producto cuando haga aplicaciones de rocío dirigido de bajo volumen para tratamientos localizados.

MEZCLAS DE TANQUE: Este producto se puede mezclar en un tanque con los siguientes productos para un mejor control de matorrales leñosos y árboles, siempre y cuando estos productos estén aprobados para el área de uso deseada.

| | | |
|---|---|---|
| Arsenal | Krenite | Transline |
| Escort XP | Telar DF | Vanquish |
| Garlon 3A | Tordon K | Velpar DF |
| Garlon 4 | Tordon 22K | Velpar L |

Puede obtener instrucciones adicionales en la sección **Áreas no cultivadas y Áreas industriales** bajo Mezclas de tanque para control de matorrales.

**Mantenimiento de Bermudagrass**

Este producto puede usarse para controlar total o parcialmente muchas malezas anuales y perennes para el mantenimiento eficaz de bermudagrass en crecimiento activo. Aplique de 12 a 36 onzas líquidas de este producto en un máximo de 80 galones de solución de rocío por acre. Para tratar malezas anuales que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

| | | |
|---|---|---|
| Bahiagrass | Fescue, tall | Trumpetcreeper |
| Bluestem, silver | Johnsongrass | Vaseygrass |

MEZCLAS DE TANQUE: Este producto puede ser mezclado con Oust XP. Si se mezcla en tanques, no use más de 12 a 36 onzas líquidas de este producto con 1 a 2 onzas de Oust XP por acre. Para tratar malezas anuales listadas en este etiqueta y en las etiqueta de Oust XP, que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas de cada producto. Use la proporción más alta a medida que las malezas anuales aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes malezas perennes:

| | | |
|---|---|---|
| Bahiagrass | Dock, curly | Trumpetcreeper |
| Blackberry | Dogfennel | Vaseygrass |
| Bluestem, silver | Fescue, tall | Vervain, blue |
| Broomsedge | Johnsongrass | |
| Dallisgrass | Poorjoe | |
| Dewberry | Raspberry | |

Úselo solamente en bermudagrass que esté bien establecido. Como resultado del tratamiento, el bermudagrass puede sufrir deterioro, pero volverá a crecer si se riega. No se recomienda repetir el tratamiento en la misma estación, ya que esto puede ocasionar daños graves al bermudagrass.

## 8.12 Bordes de carreteras

Todas las instrucciones de la sección **Áreas no cultivadas y Áreas industriales** son válidas para los bordes de las carreteras.

**Tratamiento de bordes**

Aplique este producto en los bordes de las carreteras como rociadores con brazos, rociadores con brazos y pantallas, boquillas concentradas de alto volumen, equipo de mano y equipos similares.

**Barandas y otros obstáculos para la siega**

Este producto puede ser usado para controlar las malezas que crecen debajo de las barandas y alrededor de la señalización y otros objetos en los bordes de las carreteras.

**Tratamiento localizado**

Este producto puede ser usado como tratamiento localizado para controlar la vegetación no deseada que crece a lo largo de los bordes de las carreteras.

MEZCLAS DE TANQUE: Este producto puede mezclarse en tanque con los siguientes productos para tratamientos de bordes, barandas, localizados y de suelo limpio siempre y cuando dichos productos estén aprobados para su uso en dichos sitios. Consulte las etiquetas de este producto y siga cuidadosamente las declaraciones preventivas y toda la información en las etiquetas de todos los herbicidas utilizados. Use conforme a las declaraciones preventivas más restrictivas de cada producto en la mezcla.

| | | |
|---|---|---|
| atrazine* | Landmark MP | Sahara DG |
| Crossbow L | Landmark XP | simazine* |
| dicamba* | Oust XP | Surflan AS |
| diuron* | Outrider | Surflan WDG |
| Escort XP | pendimethalin* | Telar DF |
| Endurance | Plateau | Velpar DF |
| Gallery 75 DF | Plateau DG | Velpar L |
| Krovar I DF | Poast | 2,4-D* |
| Landmark II MP | Ronstar 50 WSP | |

* Pueden realizarse mezclas en tanque con productos que contienen este ingrediente activo genérico siempre y cuando dichos productos estén aprobados para su aplicación. El usuario es responsable de asegurarse que la mezcla de productos permite la aplicación específica.

**Liberación de Bermudagrass y Bahiagrass**

**Aplicaciones cuando estén latentes (durmientes)**

Este producto puede usarse para controlar total o parcialmente muchas malezas anuales de invierno y festuca alta para el mantenimiento eficaz de bermudagrass y bahiagrass latentes. Trate solamente cuando el césped esté durmiente y antes de reverdecer en la primavera. Este producto puede mezclarse en tanque con el herbicida Outrider u Oust XP para el control residual. Las mezclas de tanque de este producto con Oust XP pueden retrasar el reverdecer.

Para obtener mejores resultados con malezas anuales de invierno, haga el tratamiento cuando las plantas estén en una etapa temprana de crecimiento (menos de 6 pulgadas de altura) después de que la mayoría haya germinado. Para obtener mejores resultados con festuca alta, haga el tratamiento cuando la festuca esté en o después de su etapa de 4 a 6 hojas.

Aplique de 6 a 48 onzas líquidas de este producto en una mezcla de tanque con 0.75 a 1.33 onzas de herbicida Outrider por acre. Lea y siga todas las instrucciones de la etiqueta del herbicida Outrider.

MEZCLAS DE TANQUE: Aplique de 6 a 48 onzas líquidas de este producto por acre, solo o en mezcla de tanque con 0.25 a 1 onza de Oust XP por acre. Aplique las dosis recomendadas en la etiqueta en 10 a 40 galones de agua por acre. Úselo solamente en áreas donde el bermudagrass o bahiagrass son deseables y en las que puede tolerarse un poco de daño o decoloración. Para evitar que el reverdecer se retrase y para minimizar el daño, no agregue más de 1 onza de Oust XP por acre sobre bermudagrass y no más de 0.5 onzas de Oust XP por acre sobre bahiagrass, y evite el tratamiento cuando estos pastos se encuentren en estado semilatente.

**Bermudagrass de crecimiento activo**

Este producto puede usarse para controlar total o parcialmente muchas malezas anuales y perennes para liberación eficaz de bermudagrass en crecimiento activo. Aplique de 12 a 36 onzas líquidas de este producto en 10 a 40 galones de solución de rocío por acre. Para tratar malezas anuales que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas. Use la proporción más alta a medida que las malezas aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes especies perennes:

| | | |
|---|---|---|
| Bahiagrass | Fescue, tall | Trumpetcreeper |
| Bluestem, silver | Johnsongrass | Vaseygrass |

MEZCLAS DE TANQUE: Este producto puede ser mezclado en tanque con el Outrider para el control total o parcial de Johnsongrass y otras malezas indicadas en la etiqueta del Outrider. Use de 6 a 24 onzas líquidas de este producto con 0.75 a 1.33 onzas de Outrider. Utilice las proporciones más altas de ambos productos para el control de malezas perennes o anuales que tengan una altura superior a 6 pulgadas.

Este producto puede ser mezclado con Oust XP. Si se mezcla en tanques, no use más de 12 a 24 onzas líquidas de este producto con 1 a 2 onzas de Oust XP por acre. Para tratar malezas anuales listadas en este etiqueta y en las etiqueta de Oust XP, que tengan menos de 6 pulgadas de altura (o el largo de los tallos), use las proporciones más bajas de cada producto. Use la proporción más alta a medida que las malezas anuales aumenten de tamaño o cuando estén cerca de la floración o de la formación de semillas. Estas proporciones también controlan parcialmente las siguientes malezas perennes:

| | | |
|---|---|---|
| Bahiagrass | Dock, curly | Poorjoe |
| Bluestem, silver | Dogfennel | Trumpetcreeper |
| Broomsedge | Fescue, tall | Vaseygrass |
| Dallisgrass | Johnsongrass | Vervain, blue |

Úselo solamente en bermudagrass que esté bien establecido. Como resultado del tratamiento, el bermudagrass puede sufrir deterioro, pero volverá a crecer si se riega. No se recomienda repetir el tratamiento de mezcla de tanque en la misma estación, ya que esto puede ocasionar daños graves al bermudagrass.

**Bahiagrass de crecimiento activo**

Para suprimir el crecimiento vegetativo e inhibir la formación de semillas de bahiagrass durante aproximadamente 45 días, aplique 4 onzas líquidas de este producto en 10 a 40 galones de agua por acre. Aplique de 1 a 2 semanas después de reverdecer completo o después de cortar a una altura uniforme de 3 a 4 pulgadas. Esta aplicación debe realizarse antes de la emergencia de las semillas.
Para suprimir hasta por 120 días, aplique 3 onzas líquidas de este producto por acre, y a continuación una aplicación de 2 a 3 onzas líquidas por acre unos 45 días más tarde. No haga más de 2 aplicaciones al año.
Este producto se puede utilizar para el control total o parcial de Johnsongrass y otras malezas indicadas en la etiqueta de Outrider, en bahiagrass en crecimiento activo. Use de 1.5 a 3.5 onzas líquidas de este producto con 0.75 a 1.33 onzas de Outrider. Utilice las proporciones más altas de ambos productos para el control de malezas perennes o anuales que tengan una altura superior a 6 pulgadas. Utilice solo en bahiagrass bien establecido.
Se puede utilizar la mezcla de tanque de este producto con Oust XP. Aplique 4 onzas líquidas de este producto con 1/4 onzas de Oust XP por acre, 1 a 2 semanas después de la primera siega de la primavera. Haga solamente una aplicación al año.

## 8.13 Sitios de servicios públicos

Este producto puede ser utilizado a lo largo de servidumbres de paso de energía eléctrica, conductos y teléfonos y en otros lugares asociados con estas servidumbres de paso, como subestaciones, bordes de carreteras, vías de ferrocarril o servidumbres de paso similares para servicios públicos. Úselo para preparar o establecer zonas de reserva de vida silvestre dentro de estos sitios, mantener los caminos de acceso y para el recorte lateral a lo largo de las servidumbres de paso.

MEZCLAS DE TANQUE: Se pueden usar mezclas de tanque de este producto para aumentar el espectro de control para malezas herbáceas, matorrales leñosos y árboles. Para la mezcla de tanque puede utilizarse cualquier cantidad de este producto que se encuentre dentro del rango indicado en la etiqueta.

Para el control de malezas herbáceas, use las proporciones más bajas de mezcla en tanque. Para controlar grupos densos o difíciles de matorrales leñosos y árboles, utilice las proporciones más altas recomendadas.

**NOTA:** Para el tratamiento de recorte lateral, este producto puede utilizase solo o en una mezcla de tanque con Garlon 4.

| | | |
|---|---|---|
| Arsenal | Krenite | Surflan AS |
| atrazine* | Krovar I DF | Surflan WDG |
| dicamba* | Oust XP | Telar DF |
| diuron* | Outrider | Transline |
| Endurance | pendimethalin* | Vanquish |
| Escort XP | Plateau | Velpar DF |
| Garlon 3A** | Sahara DG | Velpar L |
| Garlon 4 | simazine* | 2,4-D* |

* Pueden realizarse mezclas de tanque con productos que contienen este ingrediente activo genérico siempre y cuando dichos productos estén aprobados para su aplicación. El usuario es responsable de asegurarse que la mezcla de productos permita la aplicación específica.

** Asegúrese de mezclar bien el Garlon 3A con agua según las instrucciones antes de agregar este producto. Para evitar problemas de incompatibilidad de rocío, agite la mezcla del rocío en el momento que agregue este producto.

**Suelo limpio y recortado de bordes**

Este producto puede ser utilizado en áreas de servicios públicos y subestaciones para el mantenimiento del suelo limpio, el recortado de bordes alrededor de objetos, y el tratamiento localizado de vegetación no deseable, así como para eliminar las malezas no deseables que crecen en lechos de arbustos establecidos o plantaciones ornamentales. Este producto puede utilizarse antes de sembrar un área de servicios públicos con plantas ornamentales, flores y césped (panes de césped o semillas) o antes de comenzar un proyecto de construcción.
Repita las aplicaciones de este producto según emerjan las malezas para mantener el suelo vacío.

MEZCLAS DE TANQUE: Mezcle en tanque con los siguientes productos. Consulte las etiquetas de cada producto para los sitios y proporciones de aplicación aprobados. Lea y siga cuidadosamente las declaraciones preventivas toda la información en las etiquetas de todos los herbicidas utilizados. Use conforme a las declaraciones preventivas más restrictivas de cada producto en la mezcla.

| | | |
|---|---|---|
| Arsenal | Garlon 3A | Poast |
| atrazine* | Garlon 4 | Ronstar 50WP |
| Barricade 65WG | Goal 2XL | simazine* |
| Certainty | Krovar I DF | Surflan AS |
| Crossbow L | Landmark II MP | Surflan WDG |
| dicamba * | Landmark II | Telar DF |
| diuron* | Outrider | Transline |
| Endurance | Oust XP | Velpar DF |
| Escort XP | pendimethalin* | Velpar L |
| Gallery 75DF | Plateau | 2,4-D* |

* Pueden realizarse mezclas de tanque con productos que contienen este ingrediente activo genérico siempre y cuando dichos productos estén aprobados para su aplicación. El usuario es responsable de asegurarse que la mezcla de productos permita la aplicación específica.

# 9.0 PASTURAS Y TIERRAS DE PASTOREO

## 9.1 Pasturas

CULTIVOS CLASIFICADOS: Bahiagrass, Bermudagrass, Bluegrass, Brome, Fescue, Guineagrass, Kikuyugrass, Orchardgrass, Pangola grass, Ryegrass, Timothy, Wheatgrass.

**Antes de sembrar, pre emergencia, renovación de pasturas**

Este producto se puede aplicar antes de la siembra o emergencia de pastos para forraje. Además, este producto se puede utilizar para controlar especies de pasturas perennes indicadas en esta etiqueta antes de resembrar.

Si las proporciones de aplicación totales equivalen a 4.5 pintas por acre o menos, no se requiere período de espera entre el tratamiento y la utilización como alimento o pastoreo del ganado. Si la proporción es mayor de 4.5 pintas por acre, retire el ganado doméstico antes de aplicar y espere 8 semanas después de haber efectuado la aplicación para utilizar como pastura o para cosechar.

**Tratamiento localizado, aplicaciones de enjugado por encima**

Se puede aplicar este producto como tratamiento localizado o con aplicadores con enjugador en pasturas. Se pueden hacer aplicaciones en la misma área con intervalos de 30 días.

Para tratamientos localizados o métodos de aplicación de enjugado en los que se utilicen dosis de 4.5 pintas por acre o menos, se puede tratar todo el campo o una parte. Cuando se realicen tratamientos localizados o con aplicadores con enjugador utilizando dosis superiores a los 4.5 pintas por acre, no se podrá tratar más de 10 por ciento del total de la pastura cada vez. Para lograr el mejor rendimiento, retire el ganado doméstico antes de la aplicación y espere 7 días después de la aplicación antes de permitir el pastoreo del ganado o cosechar.

**Control de malezas post emergencia (Tratamientos al voleo)**

Este producto se puede aplicar en pasturas para suprimir el crecimiento competitivo y la producción de semillas de malezas anuales y vegetación no deseable. Para aplicaciones selectivas con equipo de rocío al voleo, aplique 9 a 12 onzas líquidas de este producto por acre al comenzar la primavera antes de que los pastos perennes deseables comiencen la actividad e inicien el crecimiento vegetativo. Se pueden efectuar aplicaciones al finalizar el otoño después de que los pastos perennes lleguen al período de inactividad.

Se producirá cierta atrofia de los pastos perennes si las aplicaciones al voleo se realizan cuando las plantas están activas. No se necesita período de espera entre la aplicación

y el pastoreo o para cosechar como alimento. El uso de proporciones mayores causará reducciones en el grupo de plantas. No aplique más de 4.5 pintas por acre por año en pastos de pastura, excepto en casos de renovaciones. Si debe resembrar debido a una severa reducción en el grupo de plantas, espere 30 días después de la aplicación para sembrar cualquier cultivo que no esté indicado en esta etiqueta.

## 9.2 Tierras de pastoreo

Este producto controla o inhibe muchas malezas anuales que crecen en tierras de pastoreo de pastos perennes de estaciones fría y cálida.

Para controlar satisfactoriamente e impedir la invasión de malezas de pastos anuales en tierras de pastoreo resulta imprescindible prevenir la producción de semillas de malezas. La repetición de aplicaciones en años subsiguientes debería eliminar la mayor parte de las semillas viables.

Se deberá demorar la utilización de las superficies tratadas como pastura para alentar el crecimiento de las plantas perennes deseables. Se alentará una transición satisfactoria si se permite la floración y el resembrado de las plantas perennes deseables en la zona tratada.

Aplique de 9 a 12 onzas líquidas de este producto por acre para controlar o inhibir muchas malezas, incluidas downy brome, cheatgrass, rye (centeno) para cereal y jointed goatgrass en tierras de pastoreo. Aplique cuando la mayoría de las plantas de brome se encuentren en la etapa de floración temprana y antes de que las plantas, incluidas las cabezuelas, cambien de color. Si permite el crecimiento secundario de malezas en la primavera después de las lluvias reducirá aún más la reserva de semillas y alentará la conversión del pasto perenne en lugares con malezas. Se recomienda realizar una aplicación en otoño en aquellas zonas donde la humedad en primavera es habitualmente limitada y la germinación de otoño permite el crecimiento de malezas.

En el caso de plantas de medusahead, aplique 12 onzas líquidas de este producto por acre en la etapa de 3 hojas. La demora de la aplicación después de esta etapa causará un control inferior o inaceptable. El quemado controlado puede ser útil para eliminar la capa seca superficial producida por tallos de gramíneas en descomposición lenta antes de la aplicación. Permita que las plantas broten nuevamente antes de rociar después de haber quemado. Puede ser necesario repetir las aplicaciones en años subsiguientes para eliminar el banco de semillas antes de restablecer los pastos perennes deseables en tierras de pastoreo dominadas por medusahead.

Se podría producir una ligera decoloración de los pastos deseables pero éstos reverdecerán y volverán a crecer en tierra húmeda a medida que desaparezcan los efectos de este producto. No utilice sulfato de amonio cuando rocíe pastos de tierras de pastoreo con este producto. No se requiere período de espera entre el tratamiento y la utilización como alimento o pastura para el ganado.

# 10.0 APLICACIONES EN CULTIVOS

## 10.1 CÍTRICOS

Para usarse en Florida y Texas en Calamondin, Chironja, Cidro (citron), Híbridos Cítricos, Toronja, Kumquat, Limón, Lima, Mandarina (tangerine), Naranjas (todas), Pummelo, Mandarina Satsuma, Tangelo (ugli), Tangor.

Este producto se puede aplicar como rocío al voleo antes de sembrar (preparación del lugar), en medios de hileras (entre árboles, arbustos o enredaderas), franjas (en las hileras de árboles, arbustos o enredaderas), rociadores con pantalla, aplicaciones con enjugadores, rocío dirigido o tratamiento localizado.

Se pueden realizar aplicaciones con equipo con brazos, aplicadores por goteo controlado (CDA), rociadores con pantalla, bastones de mano y de alto volumen, lanzas, pistolas para huertos o con aplicadores de enjugadores, excepto como se indique.

**Las siguientes instrucciones son específicas para Florida y Texas.**

Para quemar o controlar las malezas indicadas abajo, aplique las proporciones recomendadas de este producto en 3 a 30 galones de agua por acre. Cuando la maleza tiene follaje denso, utilice de 10 a 30 galones de agua por acre.

Para goatweed, aplique de 3 a 4.5 pintas de este producto por acre. Aplique en 20 a 30 galones de agua por acre cuando las plantas están en crecimiento activo. Use 3 pintas por acre cuando las plantas tengan menos de 8 pulgadas de altura, y 4.5 pintas por acre cuando las plantas tengan más de 8 pulgadas de altura. Si la goatweed tiene más de 8 pulgadas de altura, agregar Krovar I o Karmex puede mejorar el control. Consulte las etiquetas de los productos individuales para información específica sobre cultivos, dosis, restricciones geográficas y declaraciones preventivas.

Malezas perennes:

S = Supresión B = Quema PC = Control parcial C = Control

ROUNDUP CUSTOM PARA USO ACUÁTICO Y TERRESTRE PROPORCIÓN POR ACRE

| ESPECIES DE MALEZAS | 1.5 PT | 3 PT | 4.5 PT | 7.5 PT |
|---|---|---|---|---|
| Bermudagrass | B | -- | PC | C |
| Guineagrass | | | | |
| Texas y Florida Ridge | B | C | C | C |
| Florida Flatwoods | -- | B | C | C |
| Paragrass | B | C | C | C |
| Torpedograss | S | -- | PC | C |

Permita como mínimo 1 día entre la última aplicación y la cosecha de cultivos cítricos. Para huertos de cidro (citron), aplique solamente como rocíos dirigidos.

## 10.2 Caña de azúcar

Este producto puede aplicarse en barbecho, antes de sembrar, pre emergencia o al momento de sembrar usando rociadores con capucha, rociadores con pantalla o aplicación con enjugador en medios de hileras, como tratamiento después de la cosecha, como tratamiento localizado o tratamiento foliar para regular el crecimiento de las plantas.

**Antes de sembrar, pre emergencia, al momento de sembrar**

Aplique este producto en o alrededor de los cultivos de caña de azúcar o en los campos antes de la emergencia de las cañas. No aplique a la vegetación en o alrededor de acequias, canales o estanques que contengan agua para riego.

**Tratamiento localizado**

Aplique este producto como tratamiento localizado en caña de azúcar. Para el control de la caña de azúcar espontánea o enferma, prepare una solución de 0.75 por ciento de este producto en agua y rocíe hasta mojar el follaje de la vegetación a controlar. La caña de azúcar espontánea o enferma debe tener por lo menos 7 hojas nuevas. Evite el contacto del rocío con las plantas de caña sanas porque puede causar daños graves o destruirlas. No utilice el follaje de la caña de azúcar tratada para alimentar animales después de la aplicación.

**Tratamientos de barbecho**

Este producto se puede utilizar como sustituto de labranza en campos en barbecho entre cultivos de caña de azúcar. Este producto también puede utilizarse para eliminar el último rastrojo de retoños de caña. Para quitar los últimos rastrojos de retoños de caña aplique de 6 a 7.5 pintas de este producto por acre en 10 a 40 galones de agua por acre a los nuevos brotes de al menos 7 nuevas hojas. Para labrar, deje transcurrir un lapso de 7 o más días después de la aplicación. Puede usar equipo de aplicación aérea. Pueden hacerse aplicaciones de hasta 4.5 pintas por acre con aplicación aérea en zonas en barbecho cuando hay suficiente zona de transición para evitar lesiones debido al arrastre a cultivos adyacentes. Se pueden emplear mezclas de tanque con 2,4-D y dicamba.

**Rociadores con capucha**

Aplique este producto usando rociadores con capucha para controlar las malezas entre las hileras de caña de azúcar. Consulte la sección **EQUIPOS Y TÉCNICAS PARA LA APLICACIÓN** de esta etiqueta para obtener instrucciones de uso adicionales.

No permita el contacto de las malezas tratadas con el cultivo. Las gotas, la niebla, la espuma o las salpicaduras de la solución de herbicida que se depositan en la vegetación deseable pueden causar decoloración, atrofia o destrucción. Este daño es responsabilidad exclusiva de la persona encargada de la aplicación del producto.

**Tratamiento foliar para regular el crecimiento de las plantas**

No siembre en cultivos subsiguientes aparte de los siguientes durante 30 días después de la aplicación: Maíz (todos), soya, sorgo (millo), algodón, alfalfa, frijoles (todos), pasto para forraje, papas (irlandesas, dulces), trigo.

Cuando se aplica según las instrucciones en las condiciones descritas, este producto acelerará la maduración y extenderá el período de nivel alto de sacarosa en la caña de azúcar. Es eficaz en la caña de azúcar tanto de bajo tonelaje como de gran tonelaje. Como resultado de la desecación de la hoja, se puede esperar mejor quema de los desechos. De 2 a 3 semanas después de la aplicación, este producto puede causar que las hojas pasen de un ligero color amarillento a marrón pronunciado y se sequen, y los entrenudos superiores se acorten; puede morir el eje. La mayor parte del aumento de sacarosa se concentra en los nódulos superiores del tallo de la caña tratada. Para recuperar la mayor cantidad de azúcar donde se practica el descopado, durante la cosecha, pode en la base de la cuarta hoja. Antes de la aplicación, consulte con la autoridad de caña de azúcar en su estado o con su representante local de Monsanto acerca del grado de respuesta de sacarosa anticipado de la variedad de caña de azúcar a tratar.

Vea lo siguiente para las proporciones y los tiempos de aplicación en el estado donde se harán las aplicaciones. **NOTA:** Al tratar caña de azúcar bajo condiciones de maduración adversas, o cuando trate variedades menos receptivas, utilice la proporción más elevada dentro del rango recomendado.

**FLORIDA**—Aplique de 6 a 14 onzas líquidas de este producto por acre de 3 a 5 semanas antes de la cosecha de la ÚLTIMA CAÑA SOCA SOLAMENTE.

**HAWAII**—Aplique de 10 a 24 onzas líquidas de este producto por acre de 4 a 10 semanas antes de la cosecha.

**LOUISIANA**—Aplique de 4 a 14 onzas líquidas de este producto por acre de 3 a 7 semanas antes de la cosecha de CAÑA SOCA SOLAMENTE.

**PUERTO RICO**—Aplique 6 onzas líquidas de este producto por acre de 3 a 5 semanas antes de la cosecha de CAÑA SOCA SOLAMENTE.

**TEXAS**—Aplique de 6 a 14 onzas líquidas de este producto por acre de 3 a 5 semanas antes de la cosecha de CAÑA SOCA SOLAMENTE.

La aplicación de este producto puede iniciar el desarrollo de los ojos en los retoños. Este producto no puede aumentar el contenido de sacarosa de la caña de azúcar en condiciones de buena maduración natural. No aplique a la caña de azúcar que se cosechará para la semilla. No utilice el forraje de la caña de azúcar tratada para alimentar animales después de la aplicación.

## 10.3 Tratamientos de barbecho químico

Aplique este producto durante intervalos de barbecho que preceden a la siembra, antes de sembrar o trasplantar, al momento de sembrar o pre emergencia de los cultivos vegetales.

Al aplicar este producto antes de trasplantar o de la siembra directa de cultivos vegetales en mantillo plástico, hay que asegurarse de eliminar los residuos de este producto del

plástico antes de sembrar para evitar daños al cultivo. Los residuos se pueden eliminar con una sola aplicación de agua de 0.5 pulgadas, ya sea por lluvia o con un sistema de riego por aspersión. Asegúrese de que el agua del enjuague salga del mantillo plástico y no entre en los agujeros para trasplantar. Las aplicaciones realizadas en la emergencia provocarán daños o serán fatales para las plántulas emergidas.

Evite el contacto de este herbicida con follaje, brotes verdes o tallos, cortezas, raíces expuestas (incluidas las que emergen del mantillo plástico) o frutos de cultivos, ya que podría ocasionar daños severos o destrucción de los cultivos. Las aplicaciones después de la cosecha o en barbecho deberán realizarse por lo menos 30 días antes de sembrar cualquier cultivo que no se mencione en la etiqueta.

## 10.4 Producción de panes de césped o panes de césped comercial

**Antes de sembrar, pre emergencia, al momento de sembrar, renovación, preparación del lugar**

Este producto controla la mayoría de la vegetación existente antes de la renovación del césped o de establecer céspedes cultivados para semilla o tepes. Realice las aplicaciones antes, durante o después de sembrar o para renovación. Para lograr máximo control de la vegetación existente, demore la siembra para determinar si se produce algún crecimiento de partes de plantas subterráneas que no fueron alcanzadas por el tratamiento. En lugares donde la vegetación existente esté creciendo y el césped esté bajo un programa de siega, aplique este producto después de omitir por lo menos un corte del césped para permitir un crecimiento suficiente a fin de que el rocío sea interceptado por las plantas. Cuando sea necesario repetir el tratamiento, permita que las plantas se desarrollen lo suficiente antes de volver a tratar. Para pastos de estación cálida, como bermudagrass, las aplicaciones en verano u otoño brindan el mejor control. Se pueden utilizar equipos al voleo para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes.

No remueva la tierra ni las partes de la planta que estén bajo tierra antes del tratamiento. La labranza o las técnicas de renovación como corte vertical, perforación o rebanado deben esperar 7 días después de la aplicación a fin de permitir la absorción adecuada en las partes de la planta que estén bajo tierra. Si las dosis de aplicación ascienden a 72 onzas líquidas por acre o menos, no se requiere un período de espera entre el tratamiento y la alimentación o pastoreo del ganado. Si la proporción es mayor de 4.5 pintas por acre, retire el ganado doméstico antes de aplicar y espere 8 semanas después de haber efectuado la aplicación para utilizar como pastura o para cosechar. Para todos los cultivos no indicados en esta etiqueta, las aplicaciones se deben realizar al menos 30 días antes de sembrar. Las aplicaciones deben efectuarse antes de la emergencia del cultivo para evitar daños.

**Rociadores con pantalla**

Aplique de 1.5 a 4.5 pintas de este producto en 10 a 20 galones de agua por acre para controlar las malezas entre las hileras de semilla para pasto. La siembra uniforme en hileras rectas facilita las aplicaciones con rociador con pantalla. Se obtienen mejores resultados cuando el cultivo de semilla de pasto es suficientemente pequeño como para pasar con facilidad por las pantallas de protección. Para instrucciones adicionales, vea **Aplicadores con pantalla y con capucha** en la sección **Equipo selectivo.**

Cualquier tipo de contacto de este producto con vegetación que no se desea incluir en el tratamiento podría causar daño. Este daño es responsabilidad exclusiva de la persona encargada de la aplicación del producto.

**Aplicaciones con enjugador por la parte superior**

Los aplicadores se deben ajustar de manera que el punto de contacto del enjugador esté al menos 2 pulgadas por encima de la vegetación deseable. Las malezas deben tener al menos 6 pulgadas de altura más que la vegetación deseable. Se pueden obtener mejores resultados cuando se expone una mayor cantidad de la maleza a la solución de herbicida. Las malezas sin contacto con la solución de herbicida no serán afectadas. Esto puede ocurrir en lugares donde las malezas están muy concentradas, cuando la infestación es grave o donde la altura de las malezas es variada, lo que no permite que todas entren en contacto con el herbicida. En estas instancias, tal vez sea necesario repetir el tratamiento. Para instrucciones adicionales, vea **Aplicadores con enjugador** en la sección **Equipo selectivo**.

El contacto de la solución de herbicida con vegetación deseable puede provocar daño o destrucción.

**Tratamiento localizado**

Aplique este producto como una solución al 1 por ciento antes del despunte de los pastos cultivados para semilla. Los cultivos que reciban el rocío en el área tratada morirán. Intente evitar el arrastre o rocío fuera del área que no sea el objetivo por la misma razón. Se pueden utilizar equipos de mano para controlar restos de tepes o de otra vegetación no deseada después de cosechar los tepes.

**Creación de hileras en ryegrass anual**

Utilice de 12 a 24 onzas líquidas de este producto por acre. Use proporciones superiores cuando el ryegrass tiene una altura de más de 6 pulgadas. Se obtienen mejores resultados cuando las aplicaciones se realizan antes de que las plantas de ryegrass alcancen 6 pulgadas de alto.

Configure las alturas de las boquillas de modo que permita el espacio deseado entre hileras y al mismo tiempo evite que gotas, rocíos finos o arrastre del rocío entre en contacto con las plantas de ryegrass no tratado. Se recomienda utilizar boquillas de baja presión o boquillas de goteo diseñadas para concentrar la aplicación en una franja estrecha.

El cultivador asume toda la responsabilidad por la pérdida de cultivos a causa de la aplicación indebida de este producto.

# 11.0 APLICACIONES ALREDEDOR DEL ESTABLECIMIENTO

## 11.1 Control general de malezas y recortes y bordes

Este producto se puede utilizar para controlar malezas anuales, perennes y matorrales leñosos que se encuentran en todo el establecimiento, incluidos cimientos de edificaciones, en y a lo largo de cercas, en acequias y canales secos, a lo largo de bordes de acequias, caminos de la granja, barreras de protección, antes de sembrar ornamentos paisajistas y en zonas donde se guardan equipos.

Este producto se puede mezclar en tanque con los siguientes productos, siempre y cuando el producto específico utilizado esté registrado para el uso en estos lugares no cultivados. Consulte las etiquetas de estos productos para informarse sobre las áreas de uso y las dosis de aplicación aprobadas. Para malezas anuales, utilice 1.5 pintas de este producto por acre cuando las malezas tienen menos de 6 pulgadas de altura, 2.25 pintas por acre cuando las malezas tienen 6 a 12 pulgadas de altura y 3 pintas por acre cuando las malezas tienen más de 12 pulgadas de altura. Para las malezas perennes, aplique de 3 a 7.5 pintas por acre en estas mezclas de tanque. Para mezclas de tanque con estos productos con rociadores de mochila, pistolas de mano y otras aplicaciones de rocío para mojar de alto volumen, vea las proporciones específicas en la sección **MALEZAS ANUALES** para equipo de mano o de alto volumen de esta etiqueta.

| | | |
|---|---|---|
| Arsenal | Krovar I DF | Ronstar 50 WP |
| Banvel/Clarity | Oust XP | Sahara |
| Barricade 65WG | Pendulum 3.3 EC | simazine |
| diuron | Pendulum WDG | Surflan |
| Endurance | Plateau | Telar |
| Escort | Princep DF | Vanquish |
| Karmex DF | Princep Liquid | 2,4-D |

Este producto más las mezclas de tanque de dicamba no se pueden aplicar por rocío aéreo en California.

## 11.2 Invernaderos/Cobertizos

Este producto se puede usar para controlar las malezas que estén creciendo en o alrededor de los invernaderos y cobertizos. No debe haber vegetación deseable durante la aplicación y los equipos de ventilación deben estar apagados.

## 11.3 Segado Químico

Este producto inhibe los pastos perennes indicados en esta sección para servir como sustituto de la siega. Utilice 4.5 onzas líquidas de este producto por acre para el tratamiento de Kentucky bluegrass. Utilice 6 onzas líquidas de este producto por acre para el tratamiento de festuca alta, festuca fina, orchardgrass, quackgrass o reed canarygrass. Aplique 12 onzas líquidas por acre de este producto para el tratamiento de bermudagrass. Aplique 48 onzas líquidas de este producto por acre para el tratamiento de torpedograss o paragrass. Aplique los tratamientos en 10 a 20 galones de solución de rocío por acre. Se puede efectuar una aplicación de segado químico junto a acequias de la granja y en otros lugares del establecimiento.

Use solo en los lugares donde se puede tolerar cierto daño o decoloración temporal en pastos perennes.

# 12.0 TIPOS DE MALEZAS CONTROLADAS

Use siempre la proporción más alta de este producto por acre, dentro de las proporciones, cuando las malezas son densas o cuando crecen en un área no tocada (no cultivada).

Puede haber un resultado inferior cuando se traten malezas cubiertas con mucho polvo. Para las malezas que han sido segadas, pastadas o cortadas, permita que vuelvan a crecer antes del tratamiento.

Consulte las secciones siguientes para conocer las proporciones recomendadas para el control de malezas anuales y perennes, matorrales leñosos y árboles. Para las malezas perennes, matorrales leñosos y árboles difíciles de controlar, donde las plantas crecen en condiciones de estrés, o donde la infestación es densa, use de 4.5 a 8 cuartos de galón por acre de este producto para obtener mejores resultados.

## 12.1 Malezas anuales

Aplique a pastos anuales en crecimiento y malezas de hoja ancha.

Deje pasar por lo menos 3 días antes de remover la vegetación tratada. Después de este período las malezas se pueden cortar, labrar o quemar. Vea los usos recomendados y las instrucciones específicas de aplicación en **MODO DE EMPLEO, INFORMACIÓN SOBRE EL PRODUCTO, INSTRUCCIONES de MEZCLA y APLICACIÓN.**

Use 1.5 pintas por acre si las malezas tienen menos de 6 pulgadas de altura o largo de los tallos y 1 a 4 cuartos de galón por acre si las malezas tienen más de 6 pulgadas de altura o largo de los tallos o cuando las malezas crecen en condiciones de estrés.

Para aplicaciones de rocío para mojar, aplique una solución de 0.5 por ciento de este producto a las malezas que tengan menos de 6 pulgadas de altura o largo de los tallos. Haga la aplicación antes de

la formación de semillas para el pasto, o la formación de brotes para las malezas de hoja ancha. Para las malezas anuales que tienen más de 6 pulgadas de altura o las malezas más pequeñas que crecen en condiciones de estrés, use una solución de 0.75 a 1.5 por ciento. Use la dosis más alta para las especies difíciles de controlar o las malezas de más de 24 pulgadas de altura.

**ESPECIES DE MALEZAS**

Anoda, spurred
Balsamapple**
Barley*
Barley, little*
Barnyardgrass*
Bassia, fivehook
Bittercress*
Bluegrass, annual*
Bluegrass, bulbous*
Brome, downy*
Brome, Japanese*
Broomsedge
Buttercup*
Castorbean
Cheatgrass*
Cheeseweed (Malva parviflora)
Chervil*
Chickweed*
Geranium, Carolina
Goatgrass, jointed*
Goosegrass
Groundsel, common*
Henbit
Horseweed/Marestail(Conyza canadensis)
Itchgrass*
Johnsongrass, seedling
Junglerice
Knotweed
Kochia
Lamb's-quarters*
Lettuce, prickly*
Mannagrass, eastern*
Mayweed
Medusahead*
Morningglory (Ipomoea spp)
Mustard, blue*
Mustard, tansy*
Mustard, tumble*
Mustard, wild*
Nightshade, black*
Oats
Panicum, browntop*
Panicum, fall*
Panicum, Texas*
Pennycress, field*
Pepperweed, Virginia*
Pigweed*
Puncturevine
Purslane, common
Pusley, Florida
Ragweed, common*
Cocklebur*
Copperleaf, hophornbeam
Copperleaf, Virginia
Coreopsis, plains/tickseed*
Corn*
Crabgrass*
Cupgrass, woolly*
Dwarfdandelion*
Eclipta*
Falsedandelion*
Falseflax, smallseed*
Fiddleneck
Filaree
Fleabane, annual*
Fleabane, hairy *(Conyza bonariensis)**
Fleabane, rough*
Foxtail*
Foxtail, Carolina*
Ragweed, giant
Rice, red
Rocket, London*
Rocket, Yellow
Rye*
Ryegrass*
Sandbur, field*
Sesbania, hemp
Shattercane*
Shepherd's-purse*
Sicklepod
Signalgrass, broadleaf*
Smartweed, ladysthumb*
Smartweed, Pennsylvania*
Sorghum, grain (milo)*
Sowthistle, annual
Spanishneedles***
Speedwell, Corn*
Speedwell, purslane*
Sprangletop*
Spurge, annual
Spurge, prostrate*
Spurge, spotted*
Spurry, umbrella*
Starthistle, yellow
Stinkgrass*
Sunflower*
Teaweed / Prickly sida
Thistle, Russian
Velvetleaf
Wheat*
Wild oats*
Witchgrass*

*Cuando use equipos de aplicación al voleo en el terreno (aplicaciones aéreas o rociadores con brazos que usen boquillas tipo abanico plano), estas especies serán controladas total o parcialmente usando 12 onzas líquidas de este producto por acre. Las aplicaciones deben hacerse usando de 3 a 10 galones de volumen de la sustancia portadora por acre. Use boquillas que garanticen una cobertura completa del follaje y aplique el tratamiento cuando las malezas estén en su etapa temprana de crecimiento.

** Aplique con equipo de mano solamente.

*** Aplique 3 pintas de este producto por acre.

## 12.2 Malezas perennes

Se obtienen mejores resultados cuando las malezas perennes son tratadas después de alcanzar la etapa reproductiva de su crecimiento (formación de las semillas para pastos y formación de brotes para malezas de hoja ancha). En las plantas sin flores, los mejores resultados se obtienen cuando las plantas alcanzan la madurez. En muchas situaciones, es necesario realizar tratamientos antes de esas etapas. En esas condiciones, use la dosis de aplicación más alta dentro del rango.

- Aplique cuando las plantas que sean el objetivo estén en crecimiento activo. No aplique cuando las plantas estén en condiciones de estrés por sequía.
- Asegúrese de lograr una cobertura completa cuando efectúe tratamientos de rocío para mojar mediante un equipo de mano.
- Cuando se utilice equipo manual para tratamientos puntuales localizados de bajo volumen, aplique una solución de 4 al 8 por ciento de este producto.
- Para labrar o segar, deje transcurrir un lapso de 7 días o más después de haber aplicado el producto. Si las malezas han sido labradas o segadas, no aplique el tratamiento hasta que el crecimiento alcance las etapas especificadas.
- El tratamiento otoñal debe aplicarse antes de una helada agresiva.
- Tal vez sea necesario repetir los tratamientos para controlar malezas que se regeneran de partes subterráneas o semillas.

| Especies de malezas | Proporción (cuartos por acre) | % de solución de mano |
|---|---|---|
| Alfalfa* | 0.7 | 1.5 |
| Alligatorweed* | 3 | 1.3 |
| Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración. Será necesario repetir las aplicaciones para mantener el control. | | |
| Anise (fennel) | 1.5 – 3 | 1 – 1.5 |
| Bahiagrass | 2.3 – 3.75 | 1.5 |
| Beachgrass, European *(Ammophila arenaria)* | – | 3.5 |
| Aplique una solución al 8 por ciento de este producto, más de 0.5 a 1.5 por ciento de un surfactante no iónico en una base de rocío para mojar de bajo volumen. Se obtienen mejores resultados si las aplicaciones se realizan cuando la planta beachgrass europea está en crecimiento activo alcanzando las etapas de desarrollo de bota a despunte completo. Realice las aplicaciones antes de que pierda más del 50% del color verde de las hojas en el otoño. Puede ser necesario repetir las aplicaciones para tratar los rezagos. Observe las zonas tratadas antes de volver a sembrar vegetación deseable. Para el control selectivo de beachgrass europea mediante aplicación con enjugador, aplique una solución al 33.3 por ciento de este producto, más de 1 a 2.5 por ciento de un surfactante no iónico durante el crecimiento activo. Evite el contacto de la solución herbicida con la vegetación deseable. Se puede mejorar el rendimiento enjugando las plantas en direcciones opuestas. El mejor rendimiento se obtiene procurando el máximo contacto del equipo de enjugado con las hojas individuales. | | |
| Bentgrass* | 1 | 1.5 |
| Bermudagrass | 4 | 1.5 |
| Aplique a las plantas que sean el objetivo cuando aparezcan las cabezuelas. | | |
| Bermudagrass, de agua (knotgrass) | 1 | 1.5 |
| Bindweed, de campo | 2.3 – 3.75 | 1.5 |
| Aplique de 3 a 3.75 cuartos de galón de este producto por acre como rocío al voleo al oeste del Río Mississippi y de 2.3 a 3 cuartos de galón de este producto por acre al este del Río Mississippi. Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. El desarrollo de nuevas hojas indica crecimiento activo. Para obtener los mejores resultados, aplique al finalizar el verano o en otoño. | | |
| Bluegrass, Kentucky | 1.5 – 2.3 | 0.75 |
| Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones. | | |
| Blueweed, Texas | 2.3 – 3.75 | 1.5 |
| Aplique de 3 a 3.75 cuartos de galón de este producto por acre como rocío al voleo al oeste del Río Mississippi y de 2.3 a 3 cuartos de galón de este producto por acre al este del Río Mississippi. Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. El desarrollo de nuevas hojas indica crecimiento activo. Para obtener los mejores resultados, aplique al finalizar el verano o en otoño. | | |
| Brackenfern | 2.3 – 3 | 0.75 – 1 |
| Aplique a las frondas completamente extendidas que tengan por lo menos 18 pulgadas de longitud. | | |
| Bromegrass, smooth | 1.5 – 2.3 | 0.75 |
| Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones. | | |
| Bursage, woolly-leaf | – | 1.5 |
| Canarygrass, reed | 1.5 – 2.3 | 0.75 |
| Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones. | | |
| Cattail | 2.3 – 3.75 | 0.75 |
| Aplique cuando las plantas que sean el objetivo estén en crecimiento activo y en la etapa de floración temprana a completa. Se obtienen mejores resultados cuando la aplicación se realiza durante los meses de verano u otoño. | | |
| Clover; (trébol); rojo, blanco | 2.3 – 3.75 | 1.5 |
| Cogongrass | 2.3 – 3.75 | 1.5 |
| Aplique cuando el cogongrass tenga por lo menos 18 pulgadas de altura y esté en crecimiento activo a finales de verano o en otoño. Debido a la naturaleza densa de la vegetación que puede impedir la correcta cobertura del rocío, o a las etapas de crecimiento irregulares, pueden ser necesarios varios tratamientos para lograr el control. | | |
| Cordgrass | Vea Sección 8.1 | 2–8 |
| Programe las aplicaciones para permitir por lo menos 6 horas antes de que la marea cubra las plantas tratadas. Al aplicar rocío para mojar con equipo de mano, use una solución de 2 a 8 por ciento de este producto. Asegúrese de cubrir completamente las concentraciones de plantas, pero no rocíe hasta el punto de escurrimiento. Siga las instrucciones específicas en la Sección 8.1 **Zonas acuáticas**. | | |
| Cutgrass, giant* | 3 | 1 |
| Será necesario repetir las aplicaciones para mantener el control, particularmente donde la vegetación esté parcialmente sumergida en agua. Permita un recrecimiento sustancial hasta la etapa de 7 a 10 hojas antes de repetir la aplicación. | | |
| Dallisgrass | 2.3 – 3.75 | 1.5 |

| | | |
|---|---|---|
| Dandelion | 2.3 – 3.75 | 1.5 |
| Dock, curly | 2.3 – 3.75 | 1.5 |
| Dogbane, hemp | 3 | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener los mejores resultados, aplique al finalizar el verano o en otoño.

| | | |
|---|---|---|
| Fescue (excepto alta) | 2.3 – 3.75 | 1.5 |
| Fescue, alta | 2.3 | 1 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado.

| | | |
|---|---|---|
| Guineagrass | 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de crecimiento de por lo menos 7 hojas.

| | | |
|---|---|---|
| Hemlock, poison | 1.5 – 3 | 0.75 – 1.5 |

Vea también la sección Inyección de tallos huecos de esta etiqueta.

| | | |
|---|---|---|
| Horsenettle | 2.3 – 3.75 | 1.5 |
| Horseradish | 3 | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener los mejores resultados, aplique al finalizar el verano o en otoño.

| | | |
|---|---|---|
| Iceplant | 1.5 | 1.5 |
| Ivy; German, cape | 1.5 – 3 | 0.75 – 1.5 |
| Jerusalem artichoke | 2.3 – 3.75 | 1.5 |
| Johnsongrass | 1.5 – 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones.

| | | |
|---|---|---|
| Kikuyugrass | 1.5 – 2.3 | 0.75 |
| Knapweed | 3 | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Para obtener los mejores resultados, aplique al finalizar el verano o en otoño.

Knotweed; Bohemian, Giant, Japanese (*Polygonum bohemicum, P. sachalinense and P. cuspidatum*)
Inyección de tallos: Vea la sección Inyección de tallos huecos de esta etiqueta.
Corte de tallos: Corte los tallos limpiamente justo debajo del segundo o tercer nódulo sobre la tierra. Aplique inmediatamente 0.36 onzas líquidas (10 ml) de una solución al 50 por ciento de este producto en el "pozo" o entrenudo restante. Asegúrese de que el material eliminado de la parte superior de la planta se recoja y deseche con cuidado para evitar que tenga contacto con el suelo y regenere plantas de los brotes. Se recomienda el uso de una barrera biológica como cartón, plywood o una lámina de plástico.
El total combinado para todos los tratamientos no debe exceder 8 cuartos de galón por acre. A razón de 10 ml de una solución al 50%, puede cubrir aproximadamente 1500 tallos por acre.

| | | |
|---|---|---|
| Lantana | – | 0.75 – 1 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. Utilice dosis más altas para plantas que han alcanzado la etapa de crecimiento leñoso.

| | | |
|---|---|---|
| Lespedeza | 2.3 – 3.75 | 1.5 |
| Loosestrife, purple | 2 | 1 – 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. Se obtienen mejores resultados cuando la aplicación se realiza durante los meses de verano u otoño. El tratamiento otoñal debe aplicarse antes de una helada agresiva.

| | | |
|---|---|---|
| Lotus, American | 2 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. Se obtienen mejores resultados cuando la aplicación se realiza durante los meses de verano u otoño. El tratamiento otoñal debe aplicarse antes de una helada agresiva. Puede ser necesario repetir el tratamiento para controlar plantas que se regeneran de partes subterráneas y semillas.

| | | |
|---|---|---|
| Maidencane | 3 | 0.75 |

Será necesario repetir las aplicaciones, particularmente a la vegetación parcialmente sumergida en agua. En estas condiciones, permita el recrecimiento hasta la etapa de 7 a 10 hojas antes de repetir la aplicación.

| | | |
|---|---|---|
| Milkweed, common | 2.3 | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración.

| | | |
|---|---|---|
| Muhly, wirestem | 1.5 – 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo tengan por lo menos 8 pulgadas de altura (etapa de crecimiento de 3 a 4 hojas) y estén creciendo activamente.

| | | |
|---|---|---|
| Mullein, common | 2.3 – 3.75 | 1.5 |
| Napiergrass | 2.3 – 3.75 | 1.5 |
| Nightshade, silverleaf | 2.3 – 3.75 | 1.5 |

Aplique de 3 a 3.75 cuartos de galón de este producto por acre como rocío al voleo al oeste del Río Mississippi y de 2.3 a 3 cuartos de galón de este producto por acre al este del Río Mississippi. Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. Se pueden obtener resultados óptimos si se aplica después de formadas las bayas. El desarrollo de nuevas hojas indica crecimiento activo. Para obtener los mejores resultados, aplique al finalizar el verano o en otoño.

| | | |
|---|---|---|
| Nutsedge; purple, yellow | 2.3 | 0.75 |

Aplique este producto para controlar las plantas existentes de nutsedge y nutlets inmaduros adjuntos a las plantas tratadas. Aplique cuando las plantas que sean el objetivo estén en floración o cuando se puedan ver nuevas nueces pequeñas en las puntas de los rizomas. No se podrán controlar las nueces que todavía no germinaron y estas podrán germinar después del tratamiento. Puede ser necesario repetir las aplicaciones para mantener el control a largo plazo.

| | | |
|---|---|---|
| Orchardgrass | 1.5 – 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones.

| | | |
|---|---|---|
| Pampasgrass | 2.3 – 3.75 | 1.5 |
| Para grass | 3 | 0.75 |

Puede ser necesario repetir las aplicaciones. Permita el recrecimiento hasta la etapa de 7 a 10 hojas antes de repetir la aplicación.

| | | |
|---|---|---|
| Pepperweed, perennial | 3 | 1.5 |
| Phragmites* | 2 – 3.75 | 0.75 – 1.5 |

Para el control parcial de phragmites en Florida y los condados de otros estados que bordean el Golfo de México, aplique 3.75 cuartos de galón por acre como rocío al voleo o aplique una solución al 1.5 por ciento con equipo de mano. Para el control parcial en otras áreas de los EE.UU., aplique de 2 a 3 cuartos de galón por acre como rocío al voleo o aplique una solución al 0.75 por ciento con equipo de mano. Para obtener los mejores resultados, realice el tratamiento al final del verano o en el otoño, cuando las plantas están creciendo activamente y en floración completa. Debido a la naturaleza densa de la vegetación que puede impedir la correcta cobertura del rocío, o a las etapas de crecimiento irregulares, pueden ser necesarios varios tratamientos para lograr el control. Los efectos visuales del control pueden demorar.

| | | |
|---|---|---|
| Quackgrass | 1.5 – 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo tengan por lo menos 8 pulgadas de altura (etapa de crecimiento de 3 a 4 hojas) y estén creciendo activamente.

| | | |
|---|---|---|
| Redvine* | 1.5 | 1.5 |
| Reed, giant | 3 – 3.75 | 1.5 |

Se obtienen mejores resultados cuando las aplicaciones se realizan entre el final del verano y el otoño. Vea también la sección Inyección de tallos huecos de esta etiqueta.

| | | |
|---|---|---|
| Ryegrass, perennial | 1.5 – 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones.

| | | |
|---|---|---|
| Salvinia, giant | 3 – 3.75 | 2 |

Aplique como una solución de rocío para mojar al 2.0% v/v con 0.5 a 2.0% v/v de surfactante no iónico que contenga por lo menos 70% de ingrediente activo. Para aplicaciones al voleo, aplique de 3 a 3.75 cuartos de galón de este producto con un sistema surfactante acuático aprobado que contenga 0.1% v/v de organosilicona no iónica y 0.25% v/v de surfactante no iónico adhesivo dispersante en 3 a 40 galones por acre como aplicación al voleo. Deje pasar por lo menos 3 días antes de remover la vegetación tratada. Este producto no proporciona control de plantas completamente sumergidas o que tengan la mayor parte de su follaje bajo agua.

| | | |
|---|---|---|
| Smartweed, swamp | 2.3 – 3.75 | 1.5 |
| Spatterdock | 3 | 0.75 |

Aplique cuando la mayoría de las plantas estén en floración completa. Para obtener resultados óptimos, aplique durante los meses de verano u otoño.

| | | |
|---|---|---|
| Spurge, leafy* | – | 1.5 |
| Starthistle, yellow | – | 1.5 |
| Sweetpotato, wild* | – | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de floración o después de ella. Será necesario repetir las aplicaciones. Permita que la planta alcance la etapa de crecimiento específica antes de repetir la aplicación.

| | | |
|---|---|---|
| Thistle, artichoke | 1.5 – 2.3 | 2 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de brotación o después de ella.

| | | |
|---|---|---|
| Thistle, Canada | 1.5 – 2.3 | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de brotación o después de ella. Vea también la sección Inyección de tallos huecos de esta etiqueta.

| | | |
|---|---|---|
| Timothy | 1.5 – 2.3 | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones.

| | | |
|---|---|---|
| Torpedograss* | 3 – 3.75 | 0.75 – 1.5 |

Use las proporciones más bajas recomendadas en condiciones terrestres y las proporciones más altas en condiciones de inmersión parcial o masa flotante. Será necesario repetir las aplicaciones para mantener el control.

| | | |
|---|---|---|
| Trumpetcreeper* | 1.5 – 2.3 | 1.5 |
| Tules, common | – | 1.5 |

Aplique cuando la mayoría de las plantas que sean el objetivo se encuentren en la etapa de brotación o después de ella. Después de la aplicación, el efecto visual tardará en aparecer y puede que no ocurra por 3 semanas o más.

| | | |
|---|---|---|
| Vaseygrass | 2.3 – 3.75 | 1.5 |
| Velvetgrass | 2.3 – 3.75 | 1.5 |
| Waterhyacinth | 2.5 – 3 | 0.75 – 1 |

Aplique cuando las plantas que sean el objetivo se encuentren en la etapa de brotación o después de ella. Después de la aplicación, puede ser que los efectos visuales tarden 3 semanas o más en aparecer, y generalmente ocurre la necrosis completa y descomposición dentro de 60 a 90 días. Use las proporciones más altas recomendadas cuando se deseen efectos visuales más rápidos.

| | | |
|---|---|---|
| Waterlettuce | – | 0.75 – 1 |

Use las proporciones más altas recomendadas donde la infestación de malezas sea grave. Se obtienen mejores resultados si se aplica de mediados de verano a invierno. Si se aplica en primavera puede ser necesario repetir las aplicaciones.

| | | |
|---|---|---|
| Waterprimrose | – | 0.75 |

Aplique cuando las plantas se encuentren en la etapa de brotación o después de ella, pero antes del cambio de color del otoño. Para lograr el control óptimo es necesaria una completa cobertura.

| | | |
|---|---|---|
| Wheatgrass, western | 1.5 – 2.3 | 0.75 |

Aplique cuando la mayoría de las plantas que sean el objetivo hayan alcanzado la etapa de desarrollo de brotación tardía a floración. Si lo aplica antes de la etapa de bota, puede obtener menor control del deseado. En el otoño, aplique antes de que las plantas se pongan marrones.

*Control parcial

**Otras plantas perennes indicadas en esta etiqueta** – Aplique de 2.3 a 3.75 cuartos de galón de este producto por acre como rocío al voleo o como solución de 0.75 a 1.5 por ciento con equipo de mano. Aplique cuando las plantas que sean el objetivo estén creciendo activamente y deben haber alcanzado la etapa de crecimiento temprano de cabeza o brote temprano.

## 12.3 Matorrales leñosos y árboles

Aplique este producto después de la expansión completa de las hojas, a menos que se indique lo contrario. Utilice una proporción mayor para plantas más grandes y/o zonas de crecimiento más densas. En enredaderas, utilice la proporción máxima para plantas que han alcanzado la etapa de crecimiento leñoso. Se obtienen mejores resultados cuando la aplicación se realiza a finales del verano o en otoño, después de la formación de frutos. Aplique cuando las plantas estén en crecimiento activo. Para lograr el mejor control es necesario una completa cobertura. Evite aplicar a plantas afectadas por la sequía.
En zonas áridas, se obtienen los mejores resultados cuando las aplicaciones se realizan entre primavera y comienzos de verano, cuando las especies de matorrales tienen gran contenido de humedad y están en floración.
Asegúrese de lograr una cobertura completa cuando realice tratamientos de rocío para mojar con un equipo de mano.
Cuando use equipos de mano para tratamientos localizados con rocío dirigido de bajo volumen, aplique una solución del 4 al 8 por ciento de este producto.
Es posible que los síntomas no aparezcan antes de las heladas o del envejecimiento con tratamientos de otoño.
Para labrar, segar o eliminar, deje transcurrir un lapso de 7 días o más después de haber aplicado el producto. Tal vez sea necesario repetir el tratamiento para controlar plantas que se regeneran de partes subterráneas o semillas. Se aceptan algunos colores otoñales en especies de hoja caduca no deseables siempre y cuando no se haya producido una importante caída de las hojas. El rendimiento será inferior si se realizan tratamientos en otoño, después de una helada.

| Especies de malezas | Proporción por difusión (cuarto de galón por acre) | % Solución Rocío para mojar a mano |
|---|---|---|
| Alder | 2.3 – 3 | 0.75 – 1.2 |
| Ash* | 1.5 – 3.75 | 0.75 – 1.5 |
| Aspen, quaking | 1.5 – 2.3 | 0.75 – 1.2 |
| Bearclover (Bearmat)* | 1.5 – 3.75 | 0.75 – 1.5 |
| Beech* | 1.5 – 3.75 | 0.75 – 1.5 |
| Birch | 1.5 | 0.75 |
| Blackberry | 2.3 – 3 | 0.75 – 1.2 |
| Blackgum | 1.5 – 3.75 | 0.75 – 1.5 |
| Bracken | 1.5 – 3.75 | 0.75 – 1.5 |
| Broom; French, Scotch | 1.5 – 3.75 | 1.2 – 1.5 |
| Buckwheat, California* | 1.5 – 3 | 0.75 – 1.5 |
| Cascara* | 1.5 – 3.75 | 0.75 – 1.5 |
| Castorbean | 1.5 – 3.75 | 1.5 |
| Vea también la sección Inyección de tallos huecos de esta etiqueta. | | |
| Catsclaw* | – | 1.2 – 1.5 |
| Para control parcial, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas. | | |
| Ceanothus* | 1.5 – 3.75 | 0.75 – 1.5 |
| Chamise* | 1.5 – 3.75 | 0.75 |
| Cherry; bitter, black, pin | 1.5 – 3.75 | 1– 1.5 |
| Cottonwood, eastern | 1.5 – 3.75 | 0.75 – 1.5 |
| Coyote brush | 2.3 – 3 | 1.2 – 1.5 |
| Para control, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas. | | |
| Cypress; swamp, bald | 1.5 – 3.75 | 0.75 – 1.5 |
| Deerweed | 1.5 – 3.75 | 0.75 – 1.5 |
| Dewberry | 2.3 – 3 | 0.75 – 1.2 |
| Dogwood* | 3 – 3.75 | 1 – 2 |
| Elderberry | 1.5 | 0.75 |
| Elm* | 1.5 – 3.75 | 0.75 – 1.5 |
| Eucalyptus, bluegum | – | 1.5 |
| Para control de los rebrotes de eucalipto, aplique este producto con equipo de mano cuando los brotes tengan una altura de 6 a 12 pies. Asegúrese de conseguir una cobertura completa. | | |
| Gallberry | 1.5 – 3.75 | 0.75 – 1.5 |
| Gorse* | 1.5 – 3.75 | 0.75 – 1.5 |
| Hackberry, western | 1.5 – 3.75 | 0.75 – 1.5 |
| Hasardia* | 1.5 – 3 | 0.75 – 1.5 |
| Hawthorn | 1.5 – 2.3 | 0.75 – 1.2 |
| Hazel | 1.5 | 0.75 |
| Hickory* | 3 – 3.75 | 1 – 2 |
| Honeysuckle | 2.3 – 3 | 0.75 – 1.2 |
| Hornbeam, American* | 1.5 – 3.75 | 0.75 – 1.5 |
| Huckleberry | 1.5 – 3.75 | 0.75 – 1.5 |
| Ivy, poison | 3 – 3.75 | 1.5 |
| Kudzu | 3 | 1.5 |
| Locust, black* | 1.5 – 3 | 0.75 – 1.5 |
| Madrone resprouts* | – | 1.5 |
| Magnolia, sweetbay | 1.5 – 3.75 | 0.75 – 1.5 |
| Manzanita* | 1.5 – 3.75 | 0.75 – 1.5 |
| Maple, red | 1 – 3.75 | 0.75 – 1.2 |
| Para control, aplique una solución de 0.75 a 1.2 por ciento con equipo de mano cuando las hojas estén completamente desarrolladas. Para control parcial, aplique de 1 a 3.75 cuartos de galón de este producto por acre como rocío al voleo. | | |
| Maple, sugar | – | 0.75 – 1.2 |
| Para control, aplique una solución de 0.75 a 1.2 por ciento con equipo de mano cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas. | | |
| Maple, vine* | 1.5 – 3.75 | 0.75 – 1.5 |
| Monkey flower* | 1.5 – 3 | 0.75 – 1.5 |
| Oak; black, white* | 1.5 – 3 | 0.75 – 1.5 |
| Oak; northern pin | 1.5 – 3 | 0.75 – 1.2 |
| Para control, aplique este producto cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas. | | |
| Oak, poison | 3 – 3.75 | 1.5 |
| Puede requerirse repetir las aplicaciones para mantener el control. Los tratamientos otoñales deben aplicarse antes de que las hojas pierdan su color verde. | | |
| Oak, post | 2.3 – 3 | 0.75 – 1.2 |
| Oak, red | – | 0.75 – 1.2 |
| Para control, aplique una solución de 0.75 a 1.2 por ciento con equipo de mano cuando por lo menos el 50 por ciento de las hojas nuevas estén completamente desarrolladas. | | |
| Oak, scrub* | 1.5 – 3 | 0.75 – 1.5 |
| Oak, southern red | 1.5 – 3.75 | 1 – 1.5 |
| Orange, Osage | 1.5 – 3.75 | 0.75 – 1.5 |
| Peppertree, Brazilian (Florida holly)* | 1.5 – 3.75 | 1.5 |
| Persimmon* | 1.5 – 3.75 | 0.75 – 1.5 |
| Pine | 1.5 – 3.75 | 0.75 – 1.5 |
| Poplar, yellow* | 1.5 – 3.75 | 0.75 – 1.5 |
| Prunus | 1.5 – 3.75 | 1– 1.5 |
| Raspberry | 2.3 – 3 | 0.75 – 1.2 |
| Redbud, eastern | 1.5 – 3.75 | 0.75 – 1.5 |
| Redcedar, eastern | 1.5 – 3.75 | 0.75 – 1.5 |
| Rose, multiflora | 1.5 | 0.75 |
| Debe aplicarse antes de que las hojas se deterioren por los insectos que se alimentan de hojas. | | |
| Russian olive* | 1.5 – 3.75 | 0.75 – 1.5 |
| Sage, black | 1.5 – 3 | 0.75 |
| Sage, white* | 1.5 – 3 | 0.75 – 1.5 |
| Sagebrush, California | 1.5 – 3 | 0.75 |
| Salmonberry | 1.5 | 0.75 |
| Saltbush | – | 1 |
| Saltcedar | 3 – 3.75 | 1 – 2 |
| Para control parcial, aplique una solución de 1 a 2 por ciento de este producto con equipo de mano o de 3 a 3.75 cuartos de galón por acre como rocío al voleo. Para control, aplique una solución de 1 a 2 por ciento de este producto mezclado con 0.25 por ciento de Arsenal con equipo de mano. Para control usando aplicaciones al voleo, aplique 1.5 cuartos de galón de este producto en una mezcla de tanque con 1 pinta de Arsenal a las plantas de con menos de 6 pies de altura. Para control del saltcedar mayor de 6 pies de altura usando aplicaciones al voleo, aplique 3 cuartos de galón de este producto en una mezcla de tanque con 2 pintas de Arsenal. | | |
| Sassafras* | 1.5 – 3.75 | 0.75 – 1.5 |
| Sea Myrtle | – | 1 |
| Sourwood* | 1.5 – 3.75 | 0.75 – 1.5 |
| Sumac; laurel, poison, smooth, sugarbush, winged* | 1.5 – 3 | 0.75 – 1.5 |
| Sweetgum | 1.5 – 2.3 | 0.75 – 1.5 |
| Swordfern* | 1.5 – 3.75 | 0.75 – 1.5 |
| Tallowtree, Chinese | – | 0.75 |
| Tanoak resprouts* | – | 1.5 |
| Thimbleberry | 1.5 | 0.75 |
| Tobacco, tree* | 1.5 – 3 | 0.75 – 1.5 |
| Toyon* | – | 1.5 |
| Trumpetcreeper | 1.5 – 2.3 | 0.75 – 1.2 |
| Vine maple* | 1.5 – 3.75 | 0.75 – 1.5 |
| Virginia creeper | 1.5 – 3.75 | 0.75 – 1.5 |
| Waxmyrtle, southern* | 1.5 – 3.75 | 1.5 |
| Willow | 2.3 | 0.75 |
| Yerba Santa, California* | – | 1.5 |

* Control parcial

**Otros matorrales leñosos y árboles indicados en esta etiqueta** – Para control parcial, aplique de 1.5 a 3.75 cuartos de galón de este producto por acre como rocío al voleo o como solución de 0.75 a 1.5 por ciento con equipo de mano.

## 13.0 LÍMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD

Monsanto Company garantiza que este producto concuerda con la descripción química de la etiqueta y es razonablemente adecuado para los propósitos descritos en el folleto titulado Instrucciones de Uso Completas ("Instrucciones") cuando se usa de acuerdo con dichas Instrucciones y las condiciones que allí se detallan. NO SE HACE NINGUNA OTRA GARANTÍA EXPRESA O IMPLÍCITA ACERCA DE LA IDONEIDAD PARA UN USO PARTICULAR O COMERCIABILIDAD. Esta garantía está sujeta también a las condiciones y limitaciones que aquí se indican.

El comprador y todos los usuarios deberán reportar con prontitud a esta compañía acerca de cualquier reclamo que se base en un contrato, negligencia, estricta responsabilidad, u otros actos ilícitos.

Hasta el grado máximo permitido por la ley, el comprador y todos los usuarios son responsables por todas las pérdidas o daños que resultasen por el uso o manejo en condiciones que estén más allá del control de esta Compañía, incluyendo pero no limitándose a: incompatibilidad con productos que no sean los señalados en las Instrucciones, aplicación o contacto con vegetación que no se quiera destruir, condiciones climáticas inusuales, condiciones climáticas que estén fuera de los límites que se consideran normales en el lugar de la aplicación y para el período de tiempo en el cual se aplica, así como condiciones climáticas que estén fuera de los límites indicados en las Instrucciones, aplicaciones que no estén explícitamente aconsejadas en las Instrucciones, condiciones de humedad que estén fuera de los límites establecidos en las Instrucciones, o la presencia de productos en la tierra o sobre ella, en las plantas o en la vegetación que se está tratando, diferentes a los indicados en las Instrucciones.

Esta Compañía no garantiza ninguno de los productos reformulados o reempacados de este producto, excepto de acuerdo a los requisitos de la administración de esta Compañía y con el permiso escrito expreso de esta Compañía.

LA ÚNICA Y EXCLUSIVA COMPENSACIÓN AL USUARIO O COMPRADOR Y EL LÍMITE DE RESPONSABILIDAD DE ESTA COMPAÑÍA O DE CUALQUIER OTRO VENDEDOR POR CUALQUIER PÉRDIDA O POR TODAS LAS PÉRDIDAS, PERJUICIOS O DAÑOS QUE RESULTASEN DEL USO O MANEJO DE ESTE PRODUCTO (INCLUYENDO RECLAMOS QUE SE BASEN EN UN CONTRATO, NEGLIGENCIA, ESTRICTA RESPONSABILIDAD Y OTROS ACTOS ILÍCITOS) SERÁ EL PRECIO PAGADO POR EL USUARIO O EL COMPRADOR POR LA CANTIDAD INVOLUCRADA DE ESTE PRODUCTO, O A ELECCIÓN DE ESTA COMPAÑÍA O DE OTRO VENDEDOR, EL REEMPLAZO DE DICHA CANTIDAD, O SI NO SE OBTUVO MEDIANTE COMPRA, EL REEMPLAZO DE DICHA CANTIDAD DEL PRODUCTO. HASTA EL GRADO MÁXIMO PERMITIDO POR LA LEY, EN NINGUN CASO ESTA COMPAÑÍA U OTRO VENDEDOR SERÁN RESPONSABLES POR DAÑOS INCIDENTALES, CONSECUENTES O ESPECIALES.

En el momento de abrir y usar el producto, se asume que el comprador y todos los usuarios han aceptado las condiciones de los LÍMITES EN LA GARANTÍA Y EN LA RESPONSABILIDAD que no pueden variar por medio de ningún acuerdo verbal o escrito. Si las condiciones son inaceptables, devuelva el producto inmediatamente sin abrir el envase.

Roundup Custom, Certainty, Outrider, Monsanto y el símbolo de la enredadera son marcas comerciales de Monsanto Technology LLC. Todas las demás son propiedad de sus respectivos dueños-

No se han otorgado licencias de uso bajo ninguna patente que no sea de los Estados Unidos de América.

Reg. EPA nro. 524-343

En caso de una emergencia originada por este producto o para solicitar asistencia médica, llame con cobro revertido las 24 horas al (314) 694-4000.

MONSANTO

Envasado por:
MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI 63167, EE.UU.
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032712

# MONSANTO COMPANY

Safety Data Sheet
Commercial Product

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**
**Roundup Custom[TM] for Aquatic & Terrestrial Use**

**EPA Reg. No.**
524-343
**Product use**
Herbicide
**Chemical name**
Not applicable.
**Synonyms**
None.
**Company**
MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167
**Telephone:** 800-332-3111, **Fax:** 314-694-5557
**E-mail:** safety.datasheet@monsanto.com
**Emergency numbers**
FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).
FOR MEDICAL EMERGENCY - Day or Night: +1 (314) 694-4000 (collect calls accepted).

## 2. HAZARDS IDENTIFICATION

**Emergency overview**
**Appearance and odour (colour/form/odour):** Colourless - Amber / Liquid, (viscous) / Odourless

CAUTION!

**Potential health effects**
**Likely routes of exposure**
Skin contact, eye contact, inhalation
**Eye contact, short term**
Not expected to produce significant adverse effects when recommended use instructions are followed.
**Skin contact, short term**
Not expected to produce significant adverse effects when recommended use instructions are followed.
**Inhalation, short term**
Not expected to produce significant adverse effects when recommended use instructions are followed.
**Single ingestion**
Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

**OSHA Status**
This product is not hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**

Isopropylamine salt of N-(phosphonomethyl)glycine; {Isopropylamine salt of glyphosate}

**Composition**

| COMPONENT | CAS No. | % by weight (approximate) |
|---|---|---|
| Isopropylamine salt of glyphosate | 38641-94-0 | 53.8 |
| Water | 7732-18-5 | 46.2 |

## 4. FIRST AID MEASURES

Use personal protection recommended in section 8.

**Eye contact**
If in eyes, hold eye open and rinse slowly and gently for 15-20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

**Skin contact**
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
Wash clothes and clean shoes before re-use.

**Inhalation**
If inhaled, move person to fresh air. If person is not breathing, call emergency number or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

**Ingestion**
Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison center or doctor. Do not give anything by mouth to an unconscious person.

**Advice to doctors**
This product is not an inhibitor of cholinesterase.

**Antidote**
Treatment with atropine and oximes is not indicated.

## 5. FIRE-FIGHTING MEASURES

**Flash point**
Does not flash.

**Extinguishing media**
Recommended: Water, foam, dry chemical, carbon dioxide (CO2)

**Unusual fire and explosion hazards**
None.
Minimise use of water to prevent environmental contamination.
Environmental precautions: see section 6.

**Hazardous products of combustion**
Carbon monoxide (CO), phosphorus oxides (PxOy), nitrogen oxides (NOx)

**Fire fighting equipment**
Self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.

## 6. ACCIDENTAL RELEASE MEASURES

**Environmental precautions**

SMALL QUANTITIES:
Low environmental hazard.
LARGE QUANTITIES:
Minimise spread.
Keep out of drains, sewers, ditches and water ways.

**Methods for cleaning up**

SMALL QUANTITIES:
Absorb only in non-combustible material.
Sweep, scoop or vacuum to remove.
LARGE QUANTITIES:
Absorb in earth, sand or absorbent material.
Dig up heavily contaminated soil.
Collect in containers for disposal.
Flush residues with small quantities of water.
Minimise use of water to prevent environmental contamination.
Refer to section 7 for types of containers.

Refer to section 13 for disposal of spilled material.
Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

## 7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

**Handling**

Avoid contact with eyes, skin and clothing.
When using do not eat, drink or smoke.
Wash hands thoroughly after handling or contact.
Wash contaminated clothing before re-use.
Thoroughly clean equipment after use.
Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
Refer to section 13 of the safety data sheet for disposal of rinse water.
Emptied containers retain vapour and product residue.

**Storage**

Minimum storage temperature: -15 °C
Maximum storage temperature: 50 °C
Compatible materials for storage: stainless steel, fibreglass, plastic
Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
Keep out of reach of children.
Keep away from food, drink and animal feed.
Keep only in the original container.
Keep container tightly closed in a cool, well-ventilated place.
Partial crystallization may occur on prolonged storage below the minimum storage temperature.
If frozen, place in warm room and shake frequently to put back into solution.
Minimum shelf life: 5 years.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Airborne exposure limits**

| Components | Exposure Guidelines |
|---|---|
| Isopropylamine salt of glyphosate | No specific occupational exposure limit has been established. |

| | |
|---|---|
| Water | No specific occupational exposure limit has been established. |

**Engineering controls**
No special requirement when used as recommended.

**Eye protection**
No special requirement when used as recommended.

**Skin protection**
No special requirement when used as recommended.

**Respiratory protection**
No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

| | |
|---|---|
| Colour/colour range: | Colourless - Amber |
| Odour: | Odourless |
| Form: | Liquid, (viscous) |
| Physical form changes (melting, boiling, etc.): | |
| Melting point: | Not applicable. |
| Boiling point: | No data. |
| Flash point: | Does not flash. |
| Explosive properties: | No data. |
| Auto ignition temperature: | No data. |
| Specific gravity: | 1.206 @ 20 °C / 15.6 °C |
| Vapour pressure: | No significant volatility; aqueous solution. |
| Vapour density: | No data. |
| Evaporation rate: | No data. |
| Dynamic viscosity: | No data. |
| Kinematic viscosity: | No data. |
| Density: | 1.206 g/cm3 @ 20 °C |
| Solubility: | Water: Completely miscible. |
| pH: | 4.6 - 4.8 @ 63 g/l |
| Partition coefficient: | log Pow: < 0.000 (active ingredient) |

## 10. STABILITY AND REACTIVITY

**Stability**
Stable under normal conditions of handling and storage.

**Oxidizing properties**
No data.

**Materials to avoid/Reactivity**

Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

**Hazardous decomposition**
Thermal decomposition: Hazardous products of combustion: see section 5.

**Self-accelerating decomposition temperature (SADT)**
No data.

## 11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on product, similar products and on components are summarized below.

**Mutagenicity**
**Micronucleus test(s)**:
Not mutagenic.
**Ames test(s)**:
Not mutagenic with and without metabolic activation.

**Isopropylamine salt of glyphosate (62%)**

Data obtained on product and components are summarized below.

**Acute oral toxicity**
**Rat, LD50 (limit test)**: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.
**Mouse, LD50 (limit test)**: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.
**Acute dermal toxicity**
**Rabbit, LD50 (limit test)**: > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.
**Skin irritation**
**Rabbit, 6 animals, Draize test**:
Days to heal: 3
Primary Irritation Index (PII): 0.0/8.0
Essentially non irritating.
FIFRA category IV.
**Eye irritation**
**Rabbit, 6 animals, OECD 405 test**:
Days to heal: 0
FIFRA category IV.
**Acute inhalation toxicity**
**Rat, LC50, 4 hours, aerosol**: > 4.24 mg/L
Practically non-toxic.
FIFRA category IV.
No mortality. Maximum attainable concentration.
**Skin sensitization**
**Guinea pig, 3-induction Buehler test**:
Positive incidence: 0 %

**N-(phosphonomethyl)glycine; { glyphosate}**

**Mutagenicity**
**In vitro and in vivo mutagenicity test(s)**:
Not mutagenic.
**Repeated dose toxicity**
**Rabbit, dermal, 21 days**:
NOAEL toxicity: > 5,000 mg/kg body weight/day
Target organs/systems: none
Other effects: none
**Rat, oral, 3 months**:
NOAEL toxicity: > 20,000 mg/kg diet
Target organs/systems: none
Other effects: none
**Chronic effects/carcinogenicity**
**Rat, oral, 24 months**:
NOAEL toxicity: ~ 8,000 mg/kg diet
Target organs/systems: eyes
Other effects: decrease of body weight gain, histopathologic effects
NOEL tumour: > 20,000 ppm
Tumours: none
**Toxicity to reproduction/fertility**
**Rat, oral, 2 generations**:
NOAEL toxicity: 10,000 ppm
NOAEL reproduction: > 30,000 mg/kg diet
Target organs/systems in parents: none
Other effects in parents: decrease of body weight gain
Target organs/systems in pups: none
Other effects in pups: decrease of body weight gain
Effects on offspring only observed with maternal toxicity.
**Developmental toxicity/teratogenicity**
**Rat, oral, 6 - 19 days of gestation**:
NOAEL toxicity: 1,000 mg/kg body weight
NOAEL development: 1,000 mg/kg body weight
Other effects in mother animal: decrease of body weight gain, decrease of survival
Developmental effects: weight loss, post-implantation loss, delayed ossification
Effects on offspring only observed with maternal toxicity.
**Rabbit, oral, 6 - 27 days of gestation**:
NOAEL toxicity: 175 mg/kg body weight
NOAEL development: 175 mg/kg body weight
Target organs/systems in mother animal: none
Other effects in mother animal: decrease of survival
Developmental effects: none

## 12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on components are summarized below.

**Isopropylamine salt of glyphosate (62%)**

**Aquatic toxicity, fish**
**Bluegill sunfish (Lepomis macrochirus):**
Acute toxicity, 96 hours, static, LC50: > 1,000 mg/L
Practically non-toxic.

**Rainbow trout (Oncorhynchus mykiss):**
Acute toxicity, 96 hours, static, LC50: > 1,000 mg/L
Practically non-toxic.

**Aquatic toxicity, invertebrates**

**Water flea (Daphnia magna):**
Acute toxicity, 48 hours, static, EC50: 930 mg/L
Practically non-toxic.

**Aquatic toxicity, algae/aquatic plants**

**Green algae (Scenedesmus subspicatus):**
Acute toxicity, 72 hours, static, EbC50 (biomass): 72.9 mg/L
Slightly toxic.

**Soil organism toxicity, invertebrates**

**Earthworm (Eisenia foetida):**
Acute toxicity, 14 days, LC50: > 5,000 mg/kg dry soil
Practically non-toxic.

**N-(phosphonomethyl)glycine; { glyphosate}**

**Avian toxicity**

**Bobwhite quail (Colinus virginianus):**
Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
No more than slightly toxic.

**Mallard duck (Anas platyrhynchos):**
Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet
No more than slightly toxic.

**Bobwhite quail (Colinus virginianus):**
Acute oral toxicity, single dose, LD50: > 3,851 mg/kg body weight
Practically non-toxic.

**Arthropod toxicity**

**Honey bee (Apis mellifera):**
Oral, 48 hours, LD50: 100 µg/bee

**Honey bee (Apis mellifera):**
Contact, 48 hours, LD50: > 100 µg/bee
Practically non-toxic.

**Bioaccumulation**

**Bluegill sunfish (Lepomis macrochirus):**
Whole fish: BCF: < 1
No significant bioaccumulation is expected.

**Dissipation**

**Soil, field:**
Half life: 2 - 174 days
Koc: 884 - 60,000 L/kg
Adsorbs strongly to soil.

**Water, aerobic:**
Half life: < 7 days

## 13. DISPOSAL CONSIDERATIONS

**Product**

Not classified as hazardous waste by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261.
Keep out of drains, sewers, ditches and water ways.
Recycle if appropriate facilities/equipment available.
Burn in proper incinerator.
Follow all local/regional/national/international regulations.

**Container**

Dispose of as non hazardous industrial waste.

See the individual container label for disposal information.
Emptied containers retain vapour and product residue.
Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.
Empty packaging completely.
Triple or pressure rinse empty containers.
Pour rinse water into spray tank.
Do NOT contaminate water when disposing of rinse waters.
Do NOT re-use containers.
Store for collection by approved waste disposal service.
Follow all local/regional/national/international regulations.

Use handling recommendations in Section 7 and personal protection recommendations in Section 8.

## 14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Not hazardous under the applicable DOT, ICAO/IATA, IMO, TDG and Mexican regulations.

## 15. REGULATORY INFORMATION

**TSCA Inventory**
All components are on the US EPA's TSCA Inventory

**SARA Title III Rules**
Section 311/312 Hazard Categories
Not applicable.
Section 302 Extremely Hazardous Substances
Not applicable.
Section 313 Toxic Chemical(s)
Not applicable.

**CERCLA Reportable quantity**
Not applicable.

## 16. OTHER INFORMATION

The information given here is not necessarily exhaustive but is representative of relevant, reliable data.
Follow all local/regional/national/international regulations.
Please consult supplier if further information is needed.
For more information refer to product label.
Please consult Monsanto if further information is needed.
In this document the British spelling was applied.
® Registered trademark of Monsanto Company or its subsidiaries.

| | Health | Flammability | Instability | Additional Markings |
|---|---|---|---|---|
| NFPA | 0 | 1 | 1 | |

0 = Minimal hazard, 1 = Slight hazard, 2 = Moderate hazard, 3 = Severe hazard, 4 = Extreme hazard

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary

Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value-Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

This Material Safety Data Sheet (MSDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABELING (attached to and accompanying the product container). This MSDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, MONSANTO Company or any of its subsidiaries makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for the purposes prior to use. In no event will MONSANTO Company or any of its subsidiaries be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR TO THE PRODUCT TO WHICH INFORMATION REFERS.

# Penoxsulam (Galleon SC) Label, Supplemental Label and MSDS

# Galleon® SC

## Aquatic Herbicide

SPECIMEN

SePRO

**A selective systemic aquatic herbicide for management of freshwater aquatic vegetation in: ponds; lakes; reservoirs; marshes; wetlands; bayous; drainage ditches; non-irrigation canals; and slow-moving or quiescent bodies of water; including shoreline and riparian areas within or adjacent to these and other aquatic sites.**

**Active Ingredient**

penoxsulam: 2-(2,2-difluoroethoxy)-6-(trifluoromethyl)-N-(5,8-dimethoxy[1,2,4]riazolo- [1,5c]pyrimidin-2-yl)-benzenesulfonamide.....21.7%

**Other Ingredients**.....78.3%

**TOTAL**.....100.0%

Contains 2 pounds of active ingredient (a.i.) per gallon.

**Keep Out of Reach of Children**

**CAUTION / PRECAUCIÓN**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

In case of emergency endangering health or the environment involving this product, call **INFOTRAC** at **1-800-535-5053**.

**Agricultural Chemical:** Do not ship or store with food, feeds, drugs or clothing.

**Refer to inside of label booklet for additional precautionary information and *Directions for Use* including *First Aid* and *Storage and Disposal*.**

**Notice:** Read the entire label before using. Use only according to label directions. **Before buying or using this product, read *Terms and Conditions of Use, Warranty Disclaimer, Inherent Risks of Use*, and *Limitations of Remedies* at the end of the label booklet. If terms are unacceptable, return unopened at once.**

**Shake well before using.**

® Galleon is a registered trademark of SePRO Corporation.

EPA Reg. 67690-47
FPL20120831
166905

Manufactured for: SePRO Corporation, 11550 North Meridian Street, Suite 600, Carmel, IN 46032

## Keep Out of Reach of Children

# CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

## PRECAUTIONARY STATEMENTS

### Hazards to Humans and Domestic Animals

**Harmful if inhaled. Avoid breathing spray mist.**

| FIRST AID | |
|---|---|
| **If inhaled** | • Move person to fresh air.<br>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.<br>• Call a poison control center or doctor for further treatment advice. |
| Have the product container or label with you when calling a poison control center or doctor, or going for treatment. In case of emergency endangering health or the environment involving this product, call **INFOTRAC** at **1-800-535-5053**. | |

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

**For all types of applications, mixers and loaders must wear:**
- Long-sleeved shirt and long pants;
- Shoes plus socks; and
- Chemical-resistant gloves made of any waterproof material.

**For in-water (i.e., subsurface) applications, applicators must wear:**
- Short-sleeved shirt and long pants;
- Shoes plus socks; and
- Chemical-resistant gloves made of any waterproof material.

**For non-water applications, applicators must wear:**
- Long-sleeved shirt and long pants;
- Shoes plus socks; and
- Chemical-resistant gloves made of any waterproof material.

Remove and wash contaminated clothing before reuse. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### USER SAFETY RECOMMENDATIONS

**Users should:**
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

### ENVIRONMENTAL HAZARDS

Drift and runoff may be hazardous to non-target plants in neighboring areas if not used in accordance to label directions.

Do not contaminate water when disposing of equipment washwaters or rinsate.

**For aquatic applications:** Do not apply to water except as specified on the label.

**For terrestrial applications:** Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from treated areas.

## DIRECTION FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read all Directions for Use carefully before applying.

**Shake Well Before Using**

**IMPORTANT:** Do not use water from any treated site for food crop irrigation until concentrations are determined to be less than or equal to 1 ppb (see exceptions under *Applications to Waters Used For Irrigation* section of this label). Concentrations in food-crop irrigation water must be monitored until concentrations are 1 ppb or less. Water samples must be collected and analyzed using FasTEST or other approved analytical methods. Please refer to all precautions and restrictions under the *Applications to Waters Used for Irrigation* section of this label.

**Do not make in-water applications** to areas subject to rapid dilution of treated water and/or where sufficient exposure with targeted vegetation cannot be maintained, such as small spot or shoreline treatments in larger bodies of water.

### PRODUCT INFORMATION

Galleon® SC herbicide is a selective systemic aquatic herbicide for management of freshwater aquatic vegetation in: ponds, lakes, reservoirs, marshes, wetlands, bayous, drainage ditches, canals, and slow-moving or quiescent bodies of water, including shoreline and riparian areas within or adjacent to these and other aquatic sites.

Galleon SC may be applied directly into water or sprayed onto emergent foliage of aquatic plants or exposed sediment after drawdown. Depending upon method of application and target plant, Galleon SC is absorbed by aquatic vascular plants through emergent or floating leaves, from water through submersed plant shoots, or from hydrosoil by roots. For in-water treatments, rapid water movement or any condition resulting in rapid dilution of Galleon SC in treated water will reduce its effectiveness. Herbicidal symptoms of Galleon SC include: immediate growth inhibition, a chlorotic growing point with some tissue reddening, necrosis of the terminal bud after 2 or more weeks of exposure, and slow plant death over a period of 60 to 120 days or longer depending upon conditions for in-water applications. The level of control will depend upon timing of initial application, application rate or concentration, exposure period, and weed species. Species susceptibility to Galleon SC may vary depending upon time of year, stage of growth, and water movement. For best results, apply Galleon SC immediately after weeds begin active growth. Application to mature target plants may require higher application rates and longer exposure periods to achieve control.

This label describes both required and recommended uses of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of High-Performance Liquid Chromatography (HPLC) for the determination of the active ingredient concentration in water. Contact SePRO Corporation for the incorporation of this analysis, known as a FasTEST, into your treatment program. Other proven chemical analysis for the active ingredient may also be used. The FasTEST is referenced in this label as the preferred method for the rapid determination of the concentration of the active ingredient in the water.

### Use Precautions and Restrictions

- Obtain Required Permits: Consult with appropriate state or local pesticide and/or water authorities before applying this product in or around pubic waters. Permits and posting or treatment notification may be required by state or local public agencies.
- There are no restrictions on consumption of treated water for potable use or by livestock, pets or other animals.
- There are no restrictions on the use of treated water for recreational purposes, including swimming and fishing.
- **Chemigation:** Do not apply Galleon SC through any type of irrigation system.

- For post-emergence foliar applications or exposed sediment treatments, Galleon SC should be mixed with a surfactant. Use only surfactants that are approved or appropriate for aquatic use. Use of organosilicone surfactants with Galleon SC is not recommended.
- For treatments out of water, do not permit spray mists containing Galleon SC to drift onto desirable broadleaf plants as injury may occur. Further information on spray drift management is provided in the *Spray Drift Management* section of this label.

## Application to Waters Used For Irrigation

**Irrigation Restrictions**

Irrigation using water treated with Galleon SC may result in injury to sensitive irrigated vegetation. The following restrictions are required for irrigation use of treated water:

- Do not use water treated with Galleon SC for hydroponic farming.
- Do not use water treated with Galleon SC for irrigating greenhouse or nursery plants.
- **Food crops:** Do not irrigate established food crops, other than rice, if concentrations of Galleon SC in irrigation source water exceed 1 ppb as determined using FasTEST or other analytical techniques.
- **Rice:** Do not irrigate established rice if concentrations in treated water exceed 30 ppb.
- **Turf Irrigation:** There is no restriction on use of water treated with Galleon SC for turf irrigation, if concentrations are less than 30 ppb.
- **Non-food crop irrigation:** For other non-food crop irrigation (e.g., landscape ornamentals) or for other irrigation uses not described above, confer with SePRO Corporation prior to commencing irrigation if concentrations in treated water exceed 1 ppb as determined using FasTEST or other analytical techniques.
- **Application to Exposed Sediments:** Galleon SC may be applied to exposed sediments of dewatered areas of aquatic sites. Upon inundation, all label restrictions apply to the use of water from these treated areas (Note: refer to section titled *Application to Exposed Sediments of Dewatered Irrigation Canals* for specific directions following application in dewatered irrigation canals).
- Areas previously irrigated with water treated with Galleon SC may be planted in rice or turf. For other food crops and in areas irrigated with Galleon SC at concentrations exceeding 1 ppb, consult with SePRO Corporation for site-specific risk evaluations before planting.
- Do not apply Galleon SC to actively moving or running waters (i.e. lotic waters) used for food-crop irrigation, including rivers and streams, unless the irrigation intake can be shut-off until concentrations are 1 ppb or less.
- When making applications near an active irrigation water intake, the intake must be shut-off until concentrations in the water are 1 ppb or less as determined using FasTEST or other analytical techniques, except when irrigating turf or rice or other non-food crops. The intakes must be shut off for a sufficient period of time to allow penoxsulam in *treated water to decrease to 1 ppb or less at* the intake before use can resume.

## Spray Drift Management

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. Make applications only when there is little or no hazard from spray drift. The applicator is responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance between the outer most nozzles on the boom must not exceed 70% of the wingspan of fixed-wing aircraft or 80% of the helicopter rotor width.
2. Nozzle set up must use a coarse spray quality category per ASABE S-572 Standard.

Where states have more stringent regulations, they must be followed.

The applicator should be familiar with and take into account the information covered in the *Aerial Drift Reduction Advisory*. In general, the best drift management strategy is to apply the largest droplets that provide sufficient coverage and control.

### *Aerial Drift Reduction Advisory*

**Information on Droplet Size:** For S-572 ASABE Standard compliance, see nozzle manufacturer catalogs, NAAA booklet, or USDA literature or website for nozzle and application conditions. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Larger droplets reduce drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see *Wind, Temperature and Humidity, and Temperature Inversions*).

### Controlling Droplet Size:

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the air stream produces larger droplets than other orientations and is the recommended practice.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

**Boom Length:** Reducing the effective boom length to 70% of the wingspan of fixed-wing aircraft or 80% of the helicopter rotor width may further reduce drift without reducing swath width.

**Application Height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

**Swath Adjustment:** When applications are made with a crosswind, the swath will be displaced downwind. Therefore, the applicator must compensate for this displacement by adjusting the path of the aircraft or boom on-off. Swath adjustment distance should increase, with increasing drift potential (higher wind, height, smaller drops, etc.).

**Wind:** Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift. NOTE: State and local regulations with regard to minimum and maximum wind speeds during aerial application may be more restrictive. Aerial applicators should be familiar with these regulations.

**Temperature and Humidity:** When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is greatest when conditions are both hot and dry.

**Temperature Inversions:** Applications should not occur during a local, low level temperature inversion because drift potential is high. Small droplets can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of the smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

**Sensitive Areas:** Galleon SC should only be applied to the intended treatment area when the potential for drift to adjacent sensitive areas (e.g., residential areas, known habitat for threatened or endangered species, non-target vegetation) is minimal (e.g., when wind is blowing away from the sensitive areas). Refer to the section of this label on *Wind* under *Spray Drift Management* for more specific details.

## AQUATIC PLANTS CONTROLLED BY GALLEON SC

Performance and selectivity of Galleon SC is dependent upon dosage, time of year, stage of growth, method of application, and water movement. The following categories — controlled and partially controlled — are provided in Table 1 to describe expected efficacy under ideal treatment conditions using typical treatment rates. Plants listed as partially controlled are less susceptible under most use conditions but may show herbicide stress or partial control during active treatment phase. Use of lower rates will increase selectivity on some species listed below. Consult with SePRO Corporation prior to applying Galleon SC to determine best treatment protocols for given target vegetation.

| TABLE 1: AQUATIC PLANTS CONTROLLED BY GALLEON SC | |
|---|---|
| **Vascular Aquatic Plants Controlled** | |
| **Common name** | **Scientific name** |
| ***Floating Plants*** | |
| duckweed | multiple including *Lemna* spp.[1] |
| frog's bit | *Limnobium spongia* |
| mosquito fern | *Azolla caroliniana* |
| water fern | *Salvinia minima* and *molesta* |
| water hyacinth | *Eichhornia crassipes* |
| water lettuce | *Pistia stratiotes* |
| ***Emersed Plants*** | |
| water pennywort | *Hydrocotyle umbellata* |
| floating heart | Nymphoides spp. |
| ***Submersed Plants*** | |
| baby's tears | *Micranthemum* spp. |
| cabomba | *Cabomba caroliniana* |
| egeria, Brazilian elodea | *Egeria densa* |
| Eurasian watermilfoil | *Myriophyllum spicatum* |
| hydrilla | *Hydrilla verticillata* |
| sago pondweed | *Stuckenia pectinatus* |
| curlyleaf pondweed | *Potamogeton crispus* |
| horned pondweed | *Zannichellia palustris* |
| **Vascular Aquatic Plants Partially Controlled** | |
| ***Floating Plants*** | |
| common watermeal | *Wolffia columbiana* |
| ***Emersed Plants*** | |
| alligatorweed | *Alternanthera philoxeroides* |
| arrowhead | *Sagittaria* spp.[1] |
| parrotfeather | *Myriophyllum aquaticum* |
| pickerelweed, lanceleaf | *Pontederia* spp. |
| soft-stem bulrush | *Scirpus validus* |
| smartweed | *Polygonum* spp.[1] |
| ***Submersed Plants*** | |
| bacopa | *Bacopa* spp.[1] |
| Illinois pondweed | *Potamogeton illinoensis*[1] |
| southern naiad | *Najas guadalupensis*[1] |
| spikerush | *Eleocharis* spp.[1] |

[1] Susceptibility will likely vary between species within this genus

## APPLICATION INFORMATION

### MIXING INSTRUCTIONS

**In-Water Application to Submersed or Floating Aquatic Weeds**
Galleon SC can be applied undiluted or diluted with water for in-water applications. To dilute with water, it is recommended to fill the spray tank to one-half full with water. Start agitation. Add correct quantity of Galleon SC. Continue agitation while filling spray tank to required volume and during application.

**Foliar Application to Floating and Emergent Weeds**
Dilute Galleon SC with water to achieve proper coverage of treated plants. To dilute with water, it is recommended to fill spray tank to one-half full with water. Start agitation. A surfactant must also be used with all post-emergent foliar applications of Galleon SC. Use only surfactants that are approved or appropriate for aquatic use. Based upon surfactant label recommendations, add appropriate volume of surfactant when adding Galleon SC to spray tank. Read and follow all use directions and precautions on aquatic surfactant label. After adding Galleon SC and surfactant, continue agitation while filling spray tank to required volume and during application.

**Exposed Sediment Application for Pre-Emergence Control of Aquatic Weeds**
Galleon SC must be diluted with water for pre-emergence, exposed sediment applications. To dilute with water, it is recommended to fill spray tank to one-half full with water. Start agitation. Add correct quantity of Galleon SC. When using a surfactant, add appropriate volume of surfactant (based upon surfactant label recommendations) when adding Galleon SC to spray tank. Read and follow all use directions and precautions on surfactant label. After adding Galleon SC and any surfactant, continue agitation while filling spray tank to required volume and during application.

### APPLICATION METHODS

**In-Water Application to Submersed or Floating Aquatic Weeds**
Galleon SC can be applied as an in-water application to control weeds such as hydrilla, Eurasian watermilfoil, water hyacinth, and other susceptible weed species.

**Do not make in-water applications** to areas subject to rapid dilution of treated water and/or where sufficient exposure with targeted vegetation cannot be maintained, such as small spot or shoreline treatments in larger bodies of water.

Where greater plant selectivity is desired such as when controlling hydrilla and Eurasian watermilfoil or when targeting more susceptible species, choose an application rate lower in the rate range. SePRO Corporation recommends contacting a SePRO Aquatic Specialist to determine when to choose application rates lower in the range to meet specific plant management goals.

- **Single In-Water Application to Treatment Zone:** Where single applications to whole ponds, lakes, and reservoirs are desired, under typical treatment conditions Galleon SC should be applied at a minimum effective concentration of 25 to 75 ppb. Choose an application rate to meet the aquatic plant management objectives. Application rates necessary to obtain these concentrations in treated water are shown below. It may be necessary to re-treat the body of water if mature or more tolerant vegetation is present in the target area or heavy rainfall has diluted the treatment concentration. If re-treatment is necessary, refer to the *Split or Multiple In-Water Applications to Treatment Zone* section of the label. NOTE: The concentration of any single application or sum of all applications must not exceed 150 ppb per annual growth cycle.
- **Split or Multiple In-Water Applications to Treatment Zone:** Split or multiple applications of Galleon SC may be desirable to ensure efficacy, maintain exposure, and enhance selectivity. Under typical treatment conditions or when targeting the most susceptible species, Galleon SC should be applied initially at the minimum effective dose of 10 to 30 ppb to the treatment zone and, through the use of water analysis, add additional Galleon SC to maintain the concentration to achieve specific plant management objectives. Retreat the water to maintain a sufficient concentration for a minimum of 60 days or until satisfactory weed control is achieved. Higher concentrations and longer exposure times may be necessary when targeting less susceptible species, mature plants, and/or under conditions favorable for slower plant growth. For water analysis, use FasTEST or other analytical techniques to determine the actual concentration of Galleon SC in the water over time. NOTE: The concentration of any single application or sum of all applications must not exceed 150 ppb per annual growth cycle.

Apply Galleon SC to the treatment area at the appropriate rate to achieve target concentration. Define both size (in acres) and mean water depth (in feet) of the treatment zone prior to treatment. For each part per billion (ppb) of final concentration of active ingredient in the treatment zone, apply 0.174 fl oz per acre-foot of water. For example, for a 50 ppb treatment of 5 acres with a mean depth of 5 ft (25 acre-ft):

0.174 fl oz x 50 ppb x 25 acre ft = 217.5 fl oz (6.8 quarts or 1.7 gallons) Galleon SC applied.

The rate needed to treat 1 surface acre of water should be selected according to Table 2.

| TABLE 2: TARGET CONCENTRATION OF PENOXSULAM IN WATER (PPB) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Average Water Depth (ft) | 5 | 10 | 20 | 25 | 50 | 75 | 100 | 150 |
| | Fl. oz. (Quarts) of Galleon SC per Surface Acre at Specified Depth | | | | | | | |
| 1 | 0.9 (0.03) | 1.7 (0.05) | 3.5 (0.11) | 4.4 (0.14) | 8.7 (0.27) | 13.1 (0.41) | 17.4 (0.54) | 26.1 (0.82) |
| 2 | 1.7 (0.05) | 3.5 (0.11) | 7.0 (0.22) | 8.7 (0.27) | 17.4 (0.54) | 26.1 (0.82) | 34.8 (1.09) | 52.2 (1.63) |
| 3 | 2.6 (0.08) | 5.2 (0.16) | 10.4 (0.33) | 13.1 (0.41) | 26.1 (0.82) | 39.2 (1.22) | 52.2 (1.63) | 78.3 (2.45) |
| 4 | 3.5 (0.11) | 7.0 (0.22) | 13.9 (0.44) | 17.4 (0.54) | 34.8 (1.09) | 52.2 (1.63) | 69.6 (2.18) | 104.4 (3.26) |
| 5 | 4.4 (0.14) | 8.7 (0.27) | 17.4 (0.54) | 21.8 (0.68) | 43.5 (1.36) | 65.3 (2.04) | 87.0 (2.72) | 130.5 (4.08) |
| 6 | 5.2 (0.16) | 10.4 (0.33) | 20.9 (0.65) | 26.1 (0.82) | 52.2 (1.63) | 78.3 (2.45) | 104.4 (3.26) | 156.6 (4.89) |
| 7 | 6.1 (0.19) | 12.2 (0.38) | 24.4 (0.76) | 30.5 (0.95) | 60.9 (1.90) | 91.4 (2.86) | 121.8 (3.81) | 182.7 (5.71) |
| 8 | 7.0 (0.22) | 13.9 (0.44) | 27.8 (0.87) | 34.8 (1.09) | 69.6 (2.18) | 104.4 (3.26) | 139.2 (4.35) | 208.8 (6.53) |
| 9 | 7.8 (0.24) | 15.7 (0.49) | 31.3 (0.98) | 39.2 (1.22) | 78.3 (2.45) | 117.5 (3.67) | 156.4 (4.89) | 234.9 (7.34) |
| 10 | 8.7 (0.27) | 17.4 (0.54) | 34.8 (1.09) | 43.5 (1.36) | 87.0 (2.72) | 130.5 (4.08) | 174.0 (5.44) | 261.0 (8.15) |

For in-water applications, the maximum target concentration in any treated area is 150 ppb active ingredient per annual growth cycle.

**Foliar Application to Floating and Emergent Weeds**
Galleon SC can be applied as a foliar application to control weeds such as water hyacinth, water lettuce, water pennywort and other susceptible floating and emergent species. Applications should be conducted in a manner to maximize spray interception by target weeds while minimizing the amount of overspray that inadvertently enters the water.

For all foliar applications, apply Galleon SC at the rate of 2 to 5.6 fl. oz. per acre. Use of a surfactant is required for all foliar applications of Galleon SC. Use only surfactants that are approved or appropriate for aquatic use. Use of organosilicone surfactants with Galleon SC is not recommended. Refer to the surfactant label for use directions. Apply Galleon SC to actively growing weeds only. Do not apply to emerged weeds that are not actively growing due to moisture stress or stress due to adverse weather conditions.

**Aerial Foliar Application to Floating and Emergent Weeds**
Apply Galleon SC in a spray volume of 10 gallons per acre (gpa) or more when making a post-emergence application by air. Apply with coarse droplet category per S-572 ASABE standard; see NAAA, USDA or nozzle manufacturer guidelines. Follow guidelines in the *Spray Drift Management* and *Aerial Drift Reduction Advisory* sections to minimize potential drift to off-target vegetation. Aircraft should be patterned per Operation Safe/PAASS program for calibration and uniformity to provide sufficient coverage and control.

**Boat or Ground Foliar Application to Floating and Emergent Weeds**
When applying Galleon SC by boat or with ground equipment to emergent or floating-leaved vegetation, use boom-type, backpack or hydraulic handgun equipment. Apply Galleon SC in a sufficient spray volume (up to 100 gpa) to provide accurate and uniform distribution of spray particles over the treated vegetation while minimizing runoff. Use higher spray volumes for medium to high density vegetation. For boom spraying, use coarse or coarser nozzle spray quality per S-572 ASABE standard; see USDA literature or nozzle manufacturer guidelines. Follow nozzle manufacturer's recommendations for nozzle pressure, spacing and boom height to provide a uniform spray pattern. Follow appropriate spray drift management information where drift potential is a concern.

**Exposed Sediment Application for Pre- and Post-emergence Control of Aquatic Weeds**
Galleon SC may be applied to exposed sediments of dewatered aquatic sites for post- and pre-emergent control of susceptible weed species. Apply Galleon SC at the rate of 5.6 to 11.2 fl. oz. per acre in a total spray volume of 20 to 100 gpa to the target area of exposed sediment using boom-type, backpack, or hydraulic handgun equipment for pre-emergence weed control. For boom spraying, use coarse or coarser nozzle spray quality per S-572 ASABE standard; see USDA literature or nozzle manufacturer guidelines. Follow nozzle manufacturer's recommendations for nozzle pressure, spacing and boom height to provide a uniform spray pattern. Follow appropriate spray drift management information where drift potential is a concern. Best treatment timing and rates will be based on various factors including current and historical rainfall, soil type, and timing of reflood, all of which should be discussed with SePRO Corporation prior to treatment. For post-emergent applications, use a surfactant according to its label instructions. When present, do not apply to target emerged weeds that are not actively growing due to moisture stress or stress due to adverse weather conditions.

Refer to *Applications to Waters Used for Irrigation* section of this label for irrigation restrictions following exposed sediment applications. Upon inundation, all label restrictions apply to the use of water from these treated areas. Consult with SePRO Corporation for site specific recommendations for sampling water upon inundation.

**Application to Exposed Sediments of Dewatered Irrigation Canals**
**Applications to dewatered irrigation canals are only for use by Irrigation Districts in the Western U.S. in canals that are seasonally filled and where the Irrigation District is aware of potential downstream use of water and can ensure water is not used for irrigation purposes during the recharge or refill process.** It is recommended that the Irrigation District consult with SePRO Corporation for site specific recommendations.

Galleon SC may be applied to exposed sediments of dewatered irrigation canals during the irrigation off-season when the canals are dewatered or drained. Applications of Galleon SC to dewatered irrigation canals is only for use by Irrigation Districts, Irrigation Water Suppliers or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the Irrigation District.

Applications to dewatered irrigation canals must be conducted a minimum of 14 days prior to re-flooding. The initial flush of water during recharge or refill must not be used for irrigation purposes unless the penoxsulam concentration has been determined by an acceptable method to be 1 ppb or less. After canals have been refilled with continuous flow for a minimum of 24 hours, canal water may then be used for irrigation purposes.

## TANK MIXES WITH OTHER AQUATIC HERBICIDES

Galleon SC may be mixed with other herbicides or algaecides registered for aquatic use provided that this label does not prohibit such mixing. When tank mixing, read and follow the labeled precautionary statements, directions for use, weeds controlled, and other restrictions for each tank mix product. **Use in accordance with the most restrictive label limitations and precautions of the products used in the tank-mix.** No labeled rate or dose should be exceeded. To ensure compatibility, a jar test is recommended before field application of any tank mix combination. Consult with SePRO Corporation for latest tank mix recommendations.

**NOTE:** Tank mixing or use of Galleon SC with any other product which is not specifically and expressly authorized by the label shall be at the exclusive risk of the user, applicator and/or application adviser, to the extent allowed by applicable law.

**Galleon SC plus endothall (e.g. Aquathol K®)**
Galleon SC plus endothall is a combination of two modes of herbicidal action for improved control of hydrilla and other submersed weeds. Use only the dipotassium salt of endothall as the active ingredient in a tank mix with Galleon SC.

For best results, apply Galleon SC at concentrations from 5 to 40 ppb (0.9 to 7.0 fl. oz./acre foot) in combination with the dipotassium salt of endothall at concentrations from 0.25 to 2.0 ppm a.i. (e.g. 0.15 to 1.3 gallons Aquathol K/acre foot). Higher concentrations of Galleon SC + endothall may be used, but do not exceed the maximum allowed rate for either product. Galleon SC + endothall may be mixed in a tank or directly metered individually via the application pump system. DO NOT MIX CONCENTRATES IN A TANK WITHOUT FIRST ADDING WATER. Add Galleon SC to the tank diluted with water prior to adding endothall.

Additional or multiple applications of Galleon SC may be conducted following the initial Galleon SC + endothall treatment to meet certain plant management objectives (refer to section on *Split or Multiple In-Water Applications to Treatment Zone*). Please consult with SePRO Corporation for site and plant specific recommendations.

NOTE: Application sequencing is important to maximize the positive interaction between these two modes of action. It is best to apply Galleon SC + endothall simultaneously in a tank mix or individually at the same time, or to apply Galleon SC following endothall treatment.

NOTE: For Drinking (Potable) Water

- The drinking (potable) water restrictions for applications of Galleon SC plus endothall are to ensure that consumption of water by the public is allowed only when the concentration of endothall in the water is less than the MCL (Maximum Contamination Level) of 0.1 ppm. Applicators should consider the unique characteristics of the treated waters to assure that endothall concentrations in potable drinking water do not exceed 0.1 ppm at the time of consumption.
- For applications of Galleon SC plus endothall, the drinking water setback distance from functioning potable water intakes is ≥ 600 feet. Note: Existing potable water intakes that are no longer in use, such as those replaced by a connection to a municipal water system or a potable water well, are not considered to be functioning potable water intakes.

Galleon SC + endothall is relatively fast acting, and susceptible plants generally collapse and start to decompose in 2 to 4 weeks following treatment. Fish breathe dissolved oxygen in the water and decaying weeds also use oxygen. Therefore, when treating continuous, dense weed masses, it may be appropriate to treat only part of the infestation at a time. Waters having limited and less dense weed infestations and applications during periods of cooler water temperatures may not require partial treatments.

## RESISTANCE MANAGEMENT

The mode of action of Galleon SC is the inhibition of the acetolactate synthase (ALS) enzyme. Weed populations may develop biotypes that are resistant to different herbicides with the same mode of action. If herbicides with the same mode of action are used repeatedly at the same site, resistant biotypes may eventually dominate the weed population and may not be controlled by these products.

## STEWARDSHIP GUIDELINES FOR USE

Apply this product in compliance with Best Management Practices (BMP) that include: site assessment, prescription, and implementation. BMP have been developed to maintain and/or monitor target concentrations over large areas, ensure accurate applications and maximize treatment performance, minimize resistance development, and to monitor concentrations in water used for potential irrigation. SePRO Corporation technical specialists will work with applicators and resource managers to ensure compatibility with potential uses of the water and management objectives.

The most effective use of Galleon SC, especially in larger treatment areas, requires knowledge of the concentration of Galleon SC in treated water. This knowledge provides critical information for maximum performance, resistance management, irrigation restrictions, and overall product stewardship. This label describes both required and recommended uses of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of High-Performance Liquid Chromatography (HPLC) for the determination of the active ingredient concentration in water. Contact SePRO Corporation for the incorporation of this analysis in your treatment program. Other proven chemical analysis for the active ingredient may also be used.

NOTE: For all forms of Galleon SC use, water sampling must be conducted as necessary to meet other label requirements for treated water use. Concentrations in food-crop irrigation water must be monitored until concentrations are 1 ppb or less before treated water may be used for irrigation.

In order to accurately determine the concentrations of Galleon SC in treated water, recommendations for the minimum number of water sampling locations per treated area are provided below. The number of sampling locations will vary by site based on site morphology, bathymetry, inflows, presence of irrigation intakes, and other plant management objectives. Site locations for such sampling should be geographically referenced (i.e., GPS coordinates) and evenly distributed throughout the treated water body. Consult with SePRO Corporation for site specific recommendations.

Depending upon the application method and site specific information, water sample(s) should be collected every 10 to 30 days. Sampling should be conducted more frequently as necessary to comply with any water use restrictions and to ensure efficacy.

**TABLE 3: WATER SAMPLING GUIDELINES**

| Size of Treated Area (acres) | Number of Water Sample Locations |
|---|---|
| <100 | 1 |
| 101 – 1,000 | 1 – 3 |
| 1,001 – 2,500 | 3 – 5 |
| 2,501 – 5,000 | 5 – 8 |
| 5,001 – 10,000 | 8 – 15 |
| >10,001 | 1 additional site for every 1,000 acres |

Best practices for use of any aquatic herbicide demand the highest level of environmental assessment and stewardship. Treatment prescriptions should be tailored to meet site-specific resource management plans. Implementation of treatment programs should be conducted with equipment and protocols designed to increase treatment success through precision and quick reaction to changing environmental conditions.

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage and disposal.
**Pesticide Storage:** Store in cool dry place in original container.
**Pesticide Disposal:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
**Container Disposal**
**Nonrefillable Container. DO NOT reuse or refill this container.** Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.
**Triple rinse containers small enough to shake (capacity ≤ 5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.
**Triple rinse containers too large to shake (capacity >5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.
**Pressure rinse as follows:** Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.
**Refillable Container.** Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.
**Triple rinse as follows:** To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.
When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

## TERMS AND CONDITIONS OF USE

If terms of the following *Warranty Disclaimer, Inherent Risks of Use,* and *Limitations of Remedies* are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, to the extent consistent with applicable law, use by the buyer or any other user constitutes acceptance of the terms under *Warranty Disclaimer, Inherent Risks of Use,* and *Limitations of Remedies.*

## WARRANTY DISCLAIMER

SePRO Corporation warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

## INHERENT RISKS OF USE

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label, such as unfavorable temperature, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation or the seller. To the extent consistent with applicable law, all such risks shall be assumed by Buyer.

## LIMITATIONS OF REMEDIES

To the extent consistent with applicable law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories), shall be limited to, at Sellers election, one of the following:

1. Refund of purchase price paid by buyer or user for product bought, or
2. Replacement of amount of product used.

To the extent consistent with applicable law, SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such loss or damage in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer, Inherent Risks of Use,* and *Limitations of Remedies* cannot be varied by any written or verbal statements or agreements. No employee or sales agent of the Seller or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or this *Limitations of Remedies* in any manner.

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® Aquathol K is a trademark of United Phosphorus, Inc.

**SePRO Corporation**
11550 North Meridian Street, Suite 600
Carmel, IN 46032 U.S.A.

# Supplemental Label

# Galleon* SC
## Aquatic Herbicide

**EPA Reg. No. 67690-47** This Supplemental label expires on June 23, 2014

**Application to Exposed Sediments of Dewatered Irrigation Canals**

This supplemental label is intended for products that have been distributed and sold or for products offered for sale to end-users by wholesalers or retailers.

**Directions for Use**

**ATTENTION**

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
- This labeling must be in the possession of the user at the time of application.
- Read the label affixed to the container for Galleon SC aquatic herbicide before applying. Carefully follow all precautionary statements and applicable use directions.
- Use of Galleon SC according to this supplemental labeling is subject to all use precautions and limitations imposed by the label affixed to the container for Galleon SC.

**Application to Exposed Sediments of Dewatered Irrigation Canals**

**Applications to dewatered irrigation canals are only for use by Irrigation Districts in the Western U.S. in canals that are seasonally filled and where the Irrigation District is aware of potential downstream use of water and can ensure water is not used for irrigation purposes during the recharge or refill process.** It is recommended that the Irrigation District consult with SePRO Corporation for site specific recommendations.

**Galleon SC** may be applied to exposed sediments of dewatered irrigation canals during the irrigation off-season when the canals are dewatered or drained. Applications of Galleon SC to dewatered irrigation canals is only for use by Irrigation Districts, Irrigation Water Suppliers or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the Irrigation District.

Applications to dewatered irrigation canals must be conducted a minimum of 14 days prior to re-flooding. The initial flush of water during recharge or refill must not be used for irrigation purposes unless the penoxsulam concentration has been determined by an acceptable method to be 1 ppb or less. After canals have been refilled with continuous flow for a minimum of 24 hours, canal water may then be used for irrigation purposes.

Refer to *Applications to Waters Used for Irrigation* section of this label for irrigation restrictions following exposed sediment applications. Upon inundation, all label restrictions apply to the use of water from these treated areas. Consult with SePRO Corporation for site specific recommendations for sampling water upon inundation.

## Keep Out of Reach of Children
## CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand this label, find someone to explain it to you in detail.)

In case of emergency endangering health or the environment involving this product, call **INFOTRAC** at **1-800-535-5053**.

*Trademark of SePRO Corporation
11550 North Meridian Street, Suite 600, Carmel, IN 46032

# Material Safety Data Sheet

Transportation and Medical Emergency Phone: **1-800-535-5053**
General Phone: 317-580-8282

EPA Reg. Number: 62719-546-67690
Revision Date: 01/15/2009

# Galleon* SC Aquatic Herbicide

**SePRO Corporation** Carmel, IN 46032-4565

## 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT:** Galleon* SC Aquatic Herbicide

**COMPANY IDENTIFICATION:**
SePRO Corporation
11550 North Meridian Street, Suite 600
Carmel, IN 46032-4565
**www.sepro.com**
**Information Phone:** 317-580-8282 (Mon – Fri, 8 am to 5 pm EST)

## 2. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW**
Tan liquid with a musty odor.
• CAUTION! Causes eye irritation
**Emergency Phone Number:** 1-800-535-5053

**OSHA HAZARD COMMUNICATION STANDARD:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**Potential Health Effects**

**Eye Contact:** May cause slight temporary eye irritation. Corneal injury is unlikely.
**Skin Contact:** Prolonged contact is essentially non-irritating to skin.
**Skin Absorption:** Prolonged skin contact is unlikely to result in absorption of harmful amounts.
**Inhalation:** No adverse effects are anticipated from single exposure to mist.
**Ingestion:** Harmful effects not anticipated from swallowing small amounts. Very low toxicity if swallowed.
**Effects of Repeated Exposure:** For the active ingredient(s), effects have been reported on the following organs: kidney and liver.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

| INGREDIENTS | CAS # | AMOUNT |
|---|---|---|
| Penoxsulam | 219714-96-2 | 21.7% |
| Propylene glycol | 57-55-6 | 4.5% |
| Balance | | 73.8% |

## 4. FIRST AID MEASURES

**EYE CONTACT:** Hold eyes open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

**SKIN CONTACT:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 - 20 minutes. Call a poison control center or doctor for treatment advice.

**INHALATION:** Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). Call a poison control center or doctor for treatment advice.

**INGESTION:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

**NOTE TO PHYSICIAN:** No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor or going for treatment.

## 5. FIRE FIGHTING MEASURES

**EXTINGUISHING MEDIA:** To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

**FIRE FIGHTING PROCEDURES:** Keep people away. Isolate fire and deny unnecessary entry. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the *Accidental Release Measures* and the *Ecological Information* sections of this MSDS.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS:** Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** This material will not burn until the water has evaporated. Residue can burn. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes.

**HAZARDOUS COMBUSTION PRODUCTS:** Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: sulfur oxides, nitrogen oxides, hydrogen fluoride, fluorinated hydrocarbons, carbon monoxide, carbon dioxide.

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## 6. ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Contain spilled material if possible. **Small spills:** Absorb with materials such as: clay, dirt, sand, Zorb-all®. Collect in suitable and properly labeled containers. **Large spills:** Contact **INFOTRAC** at **1-800-535-5053** for clean-up assistance.

**PERSONAL PRECAUTIONS:** Use appropriate safety equipment. For additional information, refer to Section 8, *Exposure Controls and Personal Protection*.

**ENVIRONMENTAL PRECAUTIONS:** Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, *Ecological Information*.

## 7. HANDLING AND STORAGE

**GENERAL HANDLING:** Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

**STORAGE:** Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE LIMITS:**
• Propylene glycol: WEEL / TWA, Aerosol = 10 mg/m$^3$

**RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.**

**PERSONAL PROTECTION**
**Eye/Face Protection:** Use safety glasses.

**Skin Protection:** No precautions other than clean body-covering clothing should be needed.

Hand Protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized.

**Respiratory Protection:** Atmospheric levels should be maintained below the exposure guideline. In dusty or misty atmospheres, use an approved particulate respirator. The following should be an effective type of air-purifying respirator: organic vapor cartridge with a particulate pre-filter.

**Ingestion:** Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

**Engineering Controls: Ventilation:** Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**PHYSICAL STATE:** Liquid
**COLOR:** Tan
**ODOR:** Musty
**FLASHPOINT (CC):** >100°C (>212°F) *Setaflash Closed Cup ASTMD3828*
**FLAMMABLE LIMITS IN AIR (lower/upper):** No test data available
**AUTOIGNITION TEMPERATURE:** No test data available
**VAPOR PRESSURE:** No test data available
**BOILING POINT (760 mmHG):** No test data available
**VAPOR DENSITY (Air = 1):** No test data available
**SPECIFIC GRAVITY ($H_2O$ = 1):** No test data available
**LIQUID DENSITY:** 1.11 g/cm$^3$ *Calculated* 1.104 g/cm$^3$ *Calculated*
**FREEZING POINT:** No test data available
**MELTING POINT:** No test data available
**SOLUBILITY IN WATER (by weight):** No test data available
**pH:** 4.7 *Electrode*
**DECOMPOSITION TEMPERATURE:** No test data available
**KINEMATIC VISCOSITY:** No test data available

## 10. STABILITY AND REACTIVITY

**STABILITY/INSTABILITY:** Thermally stable at typical use temperatures.

**Conditions to Avoid:** Some components of this product can decompose at elevated temperatures.

**Incompatible Materials:** Avoid contact with oxidizing materials.

**HAZARDOUS POLYMERIZATION:** Will not occur.
**THERMAL DECOMPOSITION:** Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

## 11. TOXICOLOGICAL INFORMATION

**ACUTE TOXICITY:**
**Ingestion:** $LD_{50}$, Rat >5,000 mg/kg
**Skin Absorption:** $LD_{50}$, Rat >5,000 mg/kg
**Inhalation:** Maximum attainable concentration. $LC_{50}$, 4-hour, Aerosol, Rat >0.74 mg/L

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**SENSITIZATION:**
**Skin:** Did not cause allergic skin reactions when tested in guinea pigs.
**REPEATED DOSE TOXICITY:** For the active ingredient(s): In animals, effects have been reported on the following organs: kidney and liver.
**CHRONIC TOXICITY AND CARCINOGENICITY:** Active ingredient did not cause cancer in laboratory animals.
**DEVELOPMENTAL TOXICITY:** Active ingredient did not cause birth defects in laboratory animals.
**REPRODUCTIVE TOXICITY:** In animal studies, active ingredient did not interfere with reproduction.
**GENETIC TOXICITY:** In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

## 12. ENVIRONMENTAL INFORMATION

**ENVIRONMENTAL FATE:**

***Data for Component: Penoxsulam***
**Movement and Partitioning**
Bioconcentration potential is low (BCF <100 or log Pow <3). Potential for mobility in soil is high (Koc between 50 and 150).

**Henry's Law Constant (H):** $1.66E^{-16}$ atm*m$^3$/mole; 25°C *Estimated*
**Partition Coefficient, n-octanol/water (log Pow):** -0.354 *Measured*
**Partition Coefficient, soil organic carbon/water (Koc):** 104 *Measured*

***Persistence and Degradability***
**Indirect Photodegradation with OH Radicals:**

| Rate Constant | Atmospheric Half-life | Method |
|---|---|---|
| $6.03E^{-11}$ cm$^3$/s | 2.1 hours | Estimated |

***Data for Component: Propylene glycol***
**Movement and Partitioning**
Bioconcentration potential is low (BCF <100 or log Pow <3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry's Constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

**Henry's Law Constant (H):** $1.2E^{-8}$ atm*m$^3$/mole *Measured*
**Partition Coefficient, n-octanol/water (log Pow):** -0.92 *Measured*
**Partition Coefficient, soil organic carbon/water (Koc):** < 1 *Estimated*

***Persistence and Degradability***
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Biodegradation may occur under anaerobic conditions (in the absence of oxygen).

**Indirect Photodegradation with OH Radicals:**

| Rate Constant | Atmospheric Half-life | Method |
|---|---|---|
| $1.28E^{-11}$ cm$^3$/s | 10 hours | Estimated |

**OECD Biodegradation Tests*:***

| Biodegradation | Exposure Time | Method |
|---|---|---|
| 81% | 28 days | OECD 301F Test |
| 95.8% | 64 days | OECD 306 Test |

**Biological Oxygen Demand (BOD):**

| BOD 5 | BOD10 | BOD20 | BOD28 |
|---|---|---|---|
| 69% | 70% | 86% | |

**Chemical Oxygen Demand:** 1.53 mg/mg
**Theoretical Oxygen Demand:** 1.68 mg/mg

**ECOTOXICITY:**

***Data for Component: Penoxsulam***
Material is very highly toxic to aquatic organisms on an acute basis ($LC_{50}$/$EC_{50}$ <0.1 mg/L in most sensitive species). Material is practically non-toxic to birds on an acute basis ($LD_{50}$ >2,000 mg/kg). Material is slightly toxic to birds on a dietary basis ($LC_{50}$ between 1,001 and 5,000 ppm).

**Fish Acute & Prolonged Toxicity:** $LC_{50}$, rainbow trout (*Oncorhynchus mykiss*), static, 96-hour is >100 mg/L
**Aquatic Invertebrate Acute Toxicity:** $EC_{50}$, water flea (*Daphnia magna*), static, 48-hour, immobilization is >100 mg/L
**Aquatic Plant Toxicity:** $EC_{50}$, green alga [*Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*)], static, biomass growth inhibition, 96-hour is 0.0864 mg/L
**Toxicity to Microorganisms:** $EC_{50}$, activated sludge, activated sludge test (OECD 209), respiration inhibition, 3-hour is >1,000 mg/L

**Fish Chronic Toxicity Value (ChV):**

| ChV Value (mg/l) | Species | Test Type | Endpoint | Exposure Time |
|---|---|---|---|---|
| >10.2 | Fathead minnow (*Pimephales promelas*) | Flow-through | Growth | 36 days |

**Aquatic Invertebrates Chronic Toxicity Value:**

| ChV Value (mg/l) | Species | Test Type | Endpoint | Exposure Time |
|---|---|---|---|---|
| 5.37 | Water flea (*Daphnia magna*) | Static renewal | Number of offspring | 21 days |
| 41.8 | Saltwater mysid (*Mysidopsis bahia*) | Flow-through | Survival | 28 days |

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**Toxicity to Non-mammalian Terrestrial Species:**
Dietary $LC_{50}$, mallard duck (*Anas platyrhynchos*) >4,310 ppm
Oral $LD_{50}$, bobwhite quail (*Colinus virginianus*) >2,025 mg/kg
Contact $LD_{50}$, Honey bee (*Apis mellifera*) >100 micrograms/bee
Oral $LD_{50}$, Honey bee (*Apis mellifera*) >110 micrograms/bee

**Toxicity to Soil Dwelling Organisms:**
NOEC, Earthworm (*Eisenia foetida*), adult, 56-day is 1,000 mg/kg
NOEC, Earthworm (*Eisenia foetida*), juvenile, 56-day is 250 mg/kg

***Data for Component: Propylene glycol***
Material is practically non-toxic to aquatic organisms on an acute basis ($LC_{50}$/$EC_{50}$$EL_{50}$/$LL_{50}$ >100 mg/L in most sensitive species tested).

**Fish Acute & Prolonged Toxicity:** $LC_{50}$, rainbow trout (*Oncorhynchus mykiss*), 96-hour is 44,000 – 51,600 mg/L

**Aquatic Invertebrate Acute Toxicity:** $EC_{50}$, water flea (*Daphnia magna*), 48-hour, immobilization is 4,850 - 34,000 mg/L
$LC_{50}$, Saltwater mysid (*Mysidopsis bahia*), static, 96-hour is 18,800 mg/L

**Aquatic Plant Toxicity:** $EC_{50}$, green alga [*Pseudokirchneriella subcapitata* (formerly known as *Selenastrum capricornutum*)], biomass growth inhibition is 19,000 mg/L

**Toxicity to Microorganisms:** $EC_{50}$, activated sludge (OECD 209 Test), respiration inhibition, 3-hour is >1,000 mg/L

## 13. DISPOSAL CONSIDERATIONS

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities.

This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated and to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws and regulations.

## 14. TRANSPORT INFORMATION

**DOT Non-Bulk:** Not Regulated
**DOT Bulk:** Not Regulated
**IMDG:** Not Regulated
**ICAO/IATA:** Not Regulated

*This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of this material.*

## 15. REGULATORY INFORMATION

**OSHA HAZARD COMMUNICATION STANDARD:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986) SECTIONS 311 AND 312:**
Immediate (Acute) Health Hazard: No
Delayed (Chronic) Health Hazard: Yes
Fire Hazard: No
Reactive Hazard: No
Sudden Release of Pressure Hazard: No

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986) SECTIONS 313:** To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

**PENNSYLVANIA (WORKERS AND COMMUNITY RIGHT-TO-KNOW ACT): Pennsylvania Hazardous Substances List and/ or Pennsylvania Environmental Hazardous Substance List:**

| Component | CAS # | Amount |
|---|---|---|
| Propylene glycol | 57-55-6 | 4.5% |

**U.S. TOXIC SUBSTANCES CONTROL ACT:** All components of this product are either on the TSCA Inventory, are exempt from TSCA Inventory Requirements under 40 CFR 720.30, or comply with the PMN Polymer Exemption 40 CFR 723.250.

## 16. OTHER INFORMATION

**HAZARD RATING SYSTEM**

**(NFPA):**
Health 1
Flammability 0
Reactivity 0

**MSDS STATUS:**
New: 07/24/07
Revised: 01/15/09 (DAS102108)
Sections: 2 - 12, 14 - 16

**LEGEND:**
TWA Time Weighted Average
WEEL Workplace Environmental Exposure Level

*The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial, or local laws. The information presented here pertains only to the product as shipped.*

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# Imazamox (Clearcast) Label, Supplemental Label and MSDS

# Clearcast®

**Herbicide**

SPECIMEN

SePRO

**For the control of vegetation in and around aquatic and non-cropland sites including areas that may be grazed or cut for hay.**

**Active Ingredient**

| | |
|---|---|
| ammonium salt of imazamox 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid† | 12.1% |
| **Other Ingredients** | 87.9% |
| **TOTAL** | 100.0% |

†Equivalent to 11.4% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol- 2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid

## Keep Out of Reach of Children

## CAUTION / PRECAUCIÓN

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

In case of emergency endangering life or property involving this product, call **INFOTRAC** at **1-800-535-5053.**

**Refer to inside of label booklet for additional precautionary information and directions for use, including storage and disposal.**

**Notice:** Read the entire label before using. Use only according to label directions. **Before buying or using this product, read *Terms and Conditions of Use, Warranty Disclaimer, Inherent Risks of Use* and *Limitation of Remedies* inside label booklet.**

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EPA Reg. No. 241-437-67690
FPL20120615
NVA 2011-04-299-0224

**Manufactured for:**
**SePRO Corporation** 11550 North Meridian Street, Ste. 600, Carmel, IN 46032 U.S.A.

## Keep Out of Reach of Children

# CAUTION/PRECAUCIÓN

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| FIRST AID | |
|---|---|
| **If on skin or clothing** | • Take off contaminated clothing.<br>• Rinse skin immediately with plenty of water for 15 to 20 minutes.<br>• Call a poison control center or doctor for treatment advice. |
| **If in eyes** | • Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes.<br>• Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eyes.<br>• Call a poison control center or doctor for treatment advice. |
| **If inhaled** | • Move person to fresh air.<br>• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth to mouth if possible.<br>• Call a poison control center or doctor for further treatment advice. |
| **HOTLINE NUMBER** | |
| Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact INFOTRAC for emergency medical treatment information: **1-800-535-5053**. | |

## PRECAUTIONARY STATEMENTS

### Hazards to Humans and Domestic Animals

**CAUTION.** Harmful if absorbed through skin or inhaled. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with skin, eyes or clothing.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemically resistant to this product are listed below. If you want more options, follow the instructions for **Category A** on an EPA chemical-resistance category selection chart.

**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants;
- Chemical-resistant gloves, such as butyl rubber ≥ 14 mils, natural rubber ≥ 14 mils, neoprene rubber ≥ 14 mils, or nitrile rubber ≥ 14 mils; and
- Shoes plus socks.

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### USER SAFETY RECOMMENDATIONS

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### ENVIRONMENTAL HAZARDS

This pesticide may be hazardous to plants outside the treated area. **DO NOT** apply to water except as specified in this label. **DO NOT** contaminate water when disposing of equipment washwaters and rinsate.

## DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. This labeling must be in the possession of the user at the time of pesticide application.

**DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Ensure spray drift to nontarget susceptible species does not occur.

**DO NOT** apply **Clearcast® Herbicide** in any manner not specifically described in this label.

Observe all cautions and limitations on this label and on the labels of products used in combination with **Clearcast**. **DO NOT** use **Clearcast** other than in accordance with the instructions set forth on this label. Keep containers closed to avoid spills and contamination.

## STORAGE AND DISPOSAL

**DO NOT** contaminate food, feed or water by storage or disposal.

**Pesticide Storage**

Keep from freezing. **DO NOT** store below 32°F.

**Pesticide Disposal**

Wastes resulting from the use of this product may be disposed of on-site or at an approved waste disposal facility.

**Container Handling**

**Nonrefillable Container. DO NOT** reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

**Triple rinse containers small enough to shake (capacity ≤ 5 gallons) as follows**: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

**Triple rinse containers too large to shake (capacity > 5 gallons) as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

*(Continued)*

## STORAGE AND DISPOSAL *(continued)*

**Pressure rinse as follows:** Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refillable Container.** Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

**Triple rinse as follows:** To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

## IN CASE OF EMERGENCY

In case of large-scale spillage regarding this product, call INFOTRAC at 1-800-535-5053.

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- INFOTRAC: 1-800-535-5053

**Steps to be taken in case material is released or spilled:**

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing, and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

## PRODUCT INFORMATION

**Clearcast®** is an aqueous formulation that may be diluted in water and either applied directly to water for the control/suppression of certain submerged aquatic vegetation or applied as a broadcast or spot spray to floating and emergent vegetation. Aquatic sites that may be treated include estuarine and marine sites, ponds, lakes, reservoirs, wetlands, marshes, swamps, bayous, arroyos, ditches, canals, streams, rivers, creeks and other slow-moving or quiescent bodies of water. **Clearcast** may also be used during drawdown conditions. **Clearcast** may also be applied for terrestrial and riparian vegetation control in industrial noncropland sites, and railroad, utility, and highway rights-of-way. Industrial noncropland sites include utility plant sites, tank farms, pumping installations, storage areas, fence rows and ditch banks. **Clearcast** may also be used for the establishment and maintenance of wildlife openings. **Clearcast** may also be used on those sites listed above that may be grazed or cut for hay.

**Clearcast** is quickly absorbed by foliage and/or plant roots and rapidly translocated to the growing points stopping growth. Susceptible plants may develop a yellow appearance or general discoloration and will eventually die or be severely growth inhibited.

**Clearcast** is herbicidally active on many submerged, emergent and floating broadleaf and monocot aquatic plants. The relative levels of control and selectivity can be manipulated by using a choice of rates and herbicide placement (water injected or floating/emergent foliar application).

To help maintain the utility of herbicide programs, the use of herbicides with different modes of action is effective in managing weed resistance.

### Spray Adjuvants

Applications of **Clearcast** to emergent, floating or shoreline species require the use of a spray adjuvant. Always use a spray adjuvant that is appropriate for aquatic sites.

- **Nonionic Surfactants** - Use a nonionic surfactant at 0.25% volume/volume (v/v) or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with an HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product (alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements).
- **Methylated Seed Oils or Vegetable Oil Concentrates** - Instead of a surfactant, a methylated seed oil or vegetable-based seed oil concentrate may be used at 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, mix methylated seed oil or vegetable-based seed oil concentrates at 1% of the total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in **Clearcast** deposition and uptake by plants under stress.
- **Silicone-based Surfactants** - See manufacturer's label for specific rate recommendations. Silicone-based surfactants may reduce the surface tension of the spray droplet allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.
- **Invert Emulsions – Clearcast** can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray runoff, resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.
- **Other** - An antifoaming agent, spray pattern indicator, sinking agent or drift-reducing agent may be applied at the product labeled rate if necessary or desired.

### Spray Drift Requirements for Aerial Application

- Applicators are required to use a coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet. Applicators are required to use a very coarse or coarser droplet size or, if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for release heights above 10 feet. Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.
- Applicators are required to use upwind swath displacement.
- The boom length must not exceed 60% of the fixed wingspan or 90% of the rotor blade diameter to reduce spray drift.
- **DO NOT** apply when wind speed is greater than 10 mph.
- If applying at wind speeds less than 3 mph, the applicator must determine if
  1. Conditions of temperature inversion exist **or**
  2. Stable atmospheric conditions exist at or below nozzle height.

**DO NOT** make applications into areas of temperature inversions or stable atmospheric conditions.

### Spray Drift Requirements for Ground Boom Application

- Applicators are required to use a nozzle height below 4 feet above the ground or plant canopy and coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
- Applications with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

**DO NOT** apply when wind conditions may result in drift, when temperature inversion conditions exist, or when spray may be carried to sensitive areas. See *Managing Off-target Movement* section for more drift reduction recommendations.

## AQUATIC USE DIRECTIONS

**Clearcast®** may be applied directly to the water for the control of submerged aquatic plant species and some emergent and floating species, or as a foliar application specifically for emergent and floating species.

**DO NOT exceed maximum use rate per application:**

- Water treatment - 500 parts per billion (ppb) (173 fl ozs of **Clearcast** per acre foot)
- Foliar broadcast application – 1 gallon per acre (1.0 lb ae/A)
- Foliar spot application - up to 5% **Clearcast** by volume

**Clearcast** may be applied by surface and aerial equipment including both fixed-wing aircraft and helicopter.

### Foliar Application

**Targeted Emergent and/or Floating Vegetation Application**

To make surface applications targeting emergent or floating vegetation, uniformly apply with properly calibrated broadcast or spot treatment equipment in 10 or more gallons of water per acre. Spot treatments can be made with up to 5% **Clearcast** by volume. To ensure thorough spray coverage, higher spray volumes may be required when treating areas with large and/or dense vegetation. Use an appropriate spray pressure to minimize the drift potential depending upon spray equipment, conditions and application objectives.

**Foliar Treatment of Emergent and Floating Vegetation Guidelines**

- Always use a surfactant for foliar applications of emergent and floating weeds.
- Foliar applications of **Clearcast** may be made as a broadcast spray or as a spot spray with a percent spray solution ranging from 0.25% to 5% **Clearcast** by volume.
- Control will be reduced if spray is washed off foliage by wave action.

In aquatic sites, those application techniques described in the *Terrestrial Use Directions* section may be used to treat emergent vegetation.

### Application to Water

**Water Application to Target Submerged and/or Emergent/Floating Vegetation**

**Clearcast** may be broadcast-applied to the water surface or injected below the water surface. **Clearcast** may be applied as undiluted product or diluted with water prior to application. Under surface-matted conditions, inject **Clearcast** below the water surface to achieve better product distribution.

Apply **Clearcast** to water to achieve a final concentration of the active ingredient of no more than 500 ppb. Multiple applications of **Clearcast** may be made during the annual growth cycle to maintain the desired vegetation response.

| Clearcast Herbicide Rates Per Treated Surface Acre | | | | |
|---|---|---|---|---|
| Average Water Depth of Treatment Site (feet) | Desired Active Ingredient Concentration (ppb)† | | | |
| | 50 | 100 | 200 | 500 |
| | Clearcast Rate per Treated Surface Acre (fl ozs) | | | |
| 1 | 17 | 35 | 69 | 173 |
| 2 | 35 | 69 | 138 | 346 |
| 3 | 52 | 104 | 207 | 518 |
| 4 | 70 | 138 | 277 | 691 |
| 5 | 87 | 173 | 346 | 864 |
| 6 | 104 | 207 | 415 | 1,037 |
| 7 | 122 | 242 | 484 | 1,210 |
| 8 | 139 | 277 | 553 | 1,382 |
| 9 | 157 | 311 | 622 | 1,555 |
| 10 | 174 | 346 | 691 | 1,728 |

† **Clearcast** contains 1.0 pound of active ingredient per gallon. There are 128 fl ozs in one gallon.

### Aerial Application

**Clearcast** may be applied by both fixed-wing aircraft and helicopter. There is no minimum spray volume when making applications directly to the water. For applications targeting emergent and/or floating vegetation, uniformly apply with properly calibrated equipment in 5 or more gallons of water per surface acre. For best results, make aerial applications using a minimum of 20 gallons per acre.

### Drawdown Application

**Clearcast** may be used in drawdown situations to provide postemergence and/or preemergence control/suppression of aquatic vegetation. Apply **Clearcast** as a broadcast spray at rates up to 1 gallon/A or as a spot spray treatment with up to 5% **Clearcast** by volume. Make applications when water has receded and exposed soil is moist to dry. For postemergence (foliar) applications, wait at least two weeks after application before reintroducing water. When treating irrigation canals, the initial flush of recharge water after application must not be used for irrigation purposes.

## RESTRICTIONS AND LIMITATIONS

- **DO NOT** apply **Clearcast** to achieve a total active ingredient concentration in the water greater than 500 ppb.
- **DO NOT** apply more than 1 gallon of **Clearcast** per surface acre for the control of emergent and floating vegetation.

### Irrigation Restrictions

- **DO NOT** use treated water to irrigate greenhouses, nurseries or hydroponics.
- **DO NOT** plant sugar beets, onions, potatoes or non-**CLEARFIELD®** canola in soils that have been previously irrigated with **Clearcast**-treated water until a soil bioassay successfully demonstrates acceptable levels of crop tolerance.
- **DO NOT** use **Clearcast**-treated waters resulting in a concentration > 50 ppb for irrigation until residue levels have been shown to be ≤ 50 ppb by an acceptable method.
- Wait 24 hours before irrigating from still or quiescent waters after making a **Clearcast**-treated application for submerged vegetation < 100 feet from an irrigation intake.
- Wait 24 hours before irrigating from still and quiescent waters after making a **Clearcast** application to emergent and/or floating vegetation if > 25% of the surface area of the water body has been treated or application was made < 100 feet from an irrigation intake.
- Flowing waters may be used to irrigate allowable sites with no restrictions when **Clearcast** is applied at ≤ 2 quarts per acre to waters with an average depth of ≥ 4 feet.
- After application of **Clearcast** to dry irrigation canals/ditches, the initial flush of water during recharge must not be used for irrigation purposes unless the imazamox concentration has been determined by an acceptable method to be < 50 ppb.

**Clearcast** applied at ≤ 2 quarts per acre in or on waters with a minimum average depth ≥ 4 feet will result in **Clearcast** concentrations < 50 ppb.

### Other Water Use Restrictions

There are no restrictions on livestock watering, swimming, fishing, domestic use, or use of treated water for agricultural sprays.

### Potable Water

**Clearcast** may be applied to potable water sources at concentrations up to 500 ppb to within a distance of ¼ mile from an active potable water intake. Within ¼ mile of an active potable water intake, **Clearcast** may be applied, but water concentrations resulting from injection and/or foliar applications may not exceed 50 ppb. If water concentrations greater than 50 ppb are required, the potable water intake must be shut and, if necessary, an alternate water supply be made available until the water concentration can be shown to be less than 50 ppb by an acceptable method.

### Endangered Plant Species

To prevent potential negative impacts to endangered plant species, **DO NOT** apply **Clearcast** in a way that adversely affects federally listed endangered and threatened species.

## WEEDS CONTROLLED OR SUPPRESSED BY CLEARCAST

Efficacy and selectivity of **Clearcast** is dependent upon many factors including: dose, time of year, stage of plant growth, plant susceptibility, method of application, and water movement. Rate selection will be partially dependent on characteristics of the treatment area and whether growth regulation or control is desired. Some areas may require a repeat application to control or suppress regrowth. Consult SePRO Corporation to determine best treatment protocols to manage individual species and to meet specific aquatic plant management objectives.

| Emergent, Floating, and Shoreline Species Controlled with Foliar Application | | | |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Rate (fl ozs/A)** | **Comments** |
| Alligatorweed | *Alternanthera philoxeroides* | 64 to 128 | Repeat applications may be necessary. Add 1 qt/A of **AquaPro™ herbicide** for quicker brownout. |
| American lotus | *Nelumbo lutea* | 64 to 128 | |
| Arrowhead | *Sagittaria* spp. | 32 to 64 | |
| Cattail | *Typha* spp. | 32 to 64 | Apply after full green up through killing frost. |
| Chinese tallowtree | *Sapium sebiferum* | 64 to 128 | |
| Common reed | *Phragmites* spp. | 96 to 128 | Use 1 qt/A methylated seed oil (MSO); apply in late vegetative stage up to killing frost. Also apply as a spot treatment using 1% to 2% **Clearcast® Herbicide** per spray volume. Older stands of phragmities and stands growing in water may be more difficult to control and will require follow-up applications. |
| Common salvinia | *Salvinia minima* | 32 to 64 | Apply with MSO or MSO + silicone-based surfactant; retreatment will be necessary. |
| Floating heart | *Nymphoides* spp. | 64 to 128 | Also apply as a spot treatment using 2% to 5% **Clearcast** and 1% MSO per spray volume. |
| Floating pennywort | *Hydrocotyle ranunculoides* | 32 to 64 | Repeat applications may be necessary. |
| Flowering rush | *Butomus umbellatus* | 64 to 128 | |
| Four-leaf clover | *Marsilea* spp. | 32 to 64 | |
| Frog's bit | *Lymnobium spongia* | 16 to 32 | |
| Giant cane | *Arundo donax* | 64 to 128 | |
| Japanese knotweed | *Polygonum cuspidatum* | 64 to 128 | |
| Mexican lily | *Nymphaea mexicana* | 32 to 64 | |
| Mosquito fern | *Azolla* spp. | — | Apply using 2% to 5% **Clearcast** and 1% MSO by volume. |
| Parrotfeather | *Myriophyllum aquaticum* | 64 to 128 | Apply only to emergent vegetation. |
| Pickerelweed | *Pontederia cordata* | 32 to 64 | |
| Saltcedar | *Tamarix* spp. | 64 to 128 | Also apply using 2% to 5% **Clearcast** and 1% MSO per spray volume. |
| Smartweed, ladysthumb<br>Smartweed, Pennsylvania<br>Smartweed, swamp | *Polygonum persicaria*<br>*Polygonum pensylvanicum*<br>*Polygonum coccineum* | 64 to 128 | |
| Spatterdock | *Nuphar lutea* | 64 to 128 | |
| Variable-leaf milfoil | *Myriophyllum heterophyllum* | 64 to 128 | Apply with MSO (1% v/v) as an emergent foliar treatment when plants have emerged on the surface. Also apply as a spot treatment using 1% to 3% **Clearcast** per spray volume. |
| Water chestnut | *Trapa natans* | 64 to 128 | Apply with MSO to emergent part of plant. Also apply as a spot treatment using 2% to 5% **Clearcast** per spray volume. |
| Water hyacinth | *Eichhornia crassipes* | 16 to 32 | |
| Water lettuce | *Pistia stratiotes* | 48 to 96 | |
| Water lily | *Nymphaea* spp. | 32 to 64 | |
| Water primrose | *Ludwigia* spp. | 32 to 64 | Add 1 qt/A of **AquaPro™ herbicide** for quicker brownout. |
| Watershield | *Brasenia schreberi* | 48 to 64 | |
| Wild taro | *Colocasia esculenta* | 96 to 128 | |

**Species Susceptible to Water-injected Applications**

The following categories are provided to define species that may be growth regulated or controlled with 50 to 500 ppb **Clearcast** following in-water applications: susceptible, moderately susceptible, and less susceptible. The rates associated with each susceptibility category, including the *Special Weed Control* section, are provided as guidance with the overriding allowance that an application rate from 50 to 500 ppb may be used depending on the aquatic vegetation management objective and the characteristics of the aquatic vegetation and water body being treated.

Some species that are susceptible to foliar applications of **Clearcast** may be less susceptible to in-water applications. Use of higher rates are necessary to achieve desired control/suppression in areas of greater water exchange; when treating more mature or less susceptible plants; when targeting more difficult-to-control aquatic species; and when treating small areas in larger bodies of water (partial or spot treatments). Lower concentrations are generally used when conducting early season large-scale treatments; when greater selectivity is desired; and treating larger areas, more immature or susceptible plants, and areas with less potential for rapid water exchange.

Use of lower rates may increase selectivity on some species within the same category. Effects on susceptible plants can range from control to growth regulation depending on treatment site characteristics, exposure time, and application rate. Susceptible plant species may exhibit herbicide stress or reduced growth during active treatment phases. Whole lake applications with lower rates may provide plant growth regulation or greater selectivity while higher rates will generally provide broader activity.

**Susceptible Vascular Aquatic Plants (50 to 200 ppb)**

| Common Name | Scientific Name |
|---|---|
| Curlyleaf pondweed | *Potamogeton crispus* |
| Eurasian watermilfoil | *Myriophyllum spicatum* |
| Hydrilla | *Hydrilla verticillata* |
| Sago pondweed | *Stuckenia pectinata* |
| Water hyacinth | *Eichhornia crassipes* |
| Water stargrass | *Heteranthera dubia* |

**Moderately Susceptible Vascular Aquatic Plants (100 to 300 ppb)**

| Common Name | Scientific Name |
|---|---|
| American pondweed | *Potamogeton nodosus* |
| Bladderwort | *Utricularia* spp. |
| Frog's bit | *Lymnobium spongia* |
| Illinois pondweed | *Potamogeton illinoensis* |
| Pickerelweed | *Pontederia cordata* |
| Salvinia | *Salvinia* spp. |
| Spikerush | *Eleocharis baldwinii* |
| Variable-leaf milfoil | *Myriophyllum heterophyllum* |
| Wigeon grass | *Ruppia maritima* |

**Less Susceptible Vascular Aquatic Plants (200 to 500 ppb)**

| Common Name | Scientific Name |
|---|---|
| Bulrush | *Schoenoplectus californicus* |
| Cattail | *Typha* spp. |
| Coontail | *Ceratophyllum demersum* |
| Egeria | *Egeria densa* |
| Flowering rush | *Butomus umbellatus* |
| Spatterdock | *Nuphar lutea* |
| Southern naiad | *Najas guadalupensis* |
| Water lily | *Nymphaea odorata* |
| Watershield | *Brasenia schreberi* |

**Special Weed Control**

**Eurasian Watermilfoil.** Apply **Clearcast®** at 100 to 200 ppb to actively growing plants early in the growing season. Applications made to mature Eurasian watermilfoil (vegetation topped out) may require multiple applications.

**Hydrilla.** Apply **Clearcast** at 150 to 200 ppb to actively growing plants early in the growing season. Applications made prior to topped-out hydrilla may require repeat application. A single application of 50 to 75 ppb can be used to suppress and growth-regulate hydrilla for up to 10 to 12 weeks. If desired, an additional 50 to 75 ppb can be applied to extend the period of growth suppression when normal hydrilla growth resumes.

**Sago Pondweed.** In dry ditches (drainage and irrigation), sago pondweed may be controlled or growth-suppressed with soil-applied **Clearcast** at 64 to 128 fl ozs/A. In irrigation canals, apply **Clearcast** after drawdown and prior to water recharge.

## TERRESTRIAL USE DIRECTIONS

**Clearcast** may be applied with ground and aerial equipment including both fixed-wing aircraft and helicopter. Applications may be made using foliar broadcast spray, foliar spot spray, injection (hack and squirt), frill and girdle, cut stump, or basal methods.

**Broadcast Spray Application**

**DO NOT** apply more than 1 gallon of **Clearcast** per acre.

**Foliar Spot Application**

Apply **Clearcast** as a percent solution, containing up to 5% **Clearcast** by volume.

**Injection (Hack and Squirt), Frill and Girdle, and Cut Stump Application**

Treatments may be made using up to 100% **Clearcast** by volume.

**Basal Application**

Treatments can be made using up to 25% **Clearcast** by volume. Basal applications require the use of a good emulsion system to maintain **Clearcast** in a stable emulsion with the penetrating agent being used.

All foliar applications of **Clearcast** require the use of a spray adjuvant. Refer to the *Spray Adjuvants* section for additional information.

**Managing Off-target Movement**

The following information is general guidance for managing and minimizing off-target exposure of this product. Specific use directions in this label may vary from these general guidelines depending on the application method and objectives and should supersede the general information provided below.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-related and weather-related factors determines the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outermost nozzles on the boom must not exceed ¾ the length of the fixed wingspan or 90% of the rotor blade diameter.
2. Nozzles must always point backward parallel with the airstream and never be pointed downward more than 45 degrees.
3. **DO NOT** apply if wind speed is greater than 10 mph, except when making injection or subsurface applications to water.

Where states have more stringent regulations, they must be observed.

The applicator must be familiar with and take into account the information covered in the following aerial drift reduction advisory information.

**Information on Droplet Size**

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly or under unfavorable environmental conditions (see *Wind; Temperature and Humidity*; and *Temperature Inversions*).

**Controlling Droplet Size:**

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure – DO NOT** exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provides uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is recommended practice. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid-stream nozzles oriented straight back produce the largest droplets and the lowest drift.

**Boom Length**

For some use patterns, reducing the effective boom length to less than ¾ of the fixed wingspan or 90% of rotor blade diameter may further reduce drift without reducing swath width.

**Application Height**

Applications must not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

**Swath Adjustment**

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the upwind and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller droplets, etc.).

**Wind**

Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application must be avoided below 2 mph due to variable wind direction and high inversion potential.

**NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

**Temperature and Humidity**

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

**Temperature Inversions**
Applications must not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing that causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light, variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light-to-no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

**Sensitive Areas**
The pesticide must only be applied when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, or crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

Applicator is responsible for any loss or damage which results from spraying **Clearcast® Herbicide** in a manner other than directed in this label. In addition, applicator must follow all applicable state and local regulations and ordinances in regard to spraying.

**Clearcast** may be used for the control of the following plant species. **Clearcast** may be effective for the control or suppression of additional plant species not listed below. The use of **Clearcast** for the control or suppression of undesirable plants not listed below may be done at the discretion of the user.

**To the extent consistent with applicable law, the user assumes responsibility for any lack of control or suppression associated with application to weeds not listed on this label.**

| Weeds Controlled | | | |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Rate Foliar** (fl ozs/A) | **Comments** |
| Alligator weed | *Alternanthera philoxeroides* | 64 to 128 | Addition of AquaPro™ herbicide will improve efficacy. |
| Annual ryegrass | *Lolium multiflorum* | 16 to 32 | |
| Artichoke, Jerusalem | *Helianthus tuberosus* | 64 to 128 | |
| Bedstraw | *Galium aparine* | 64 to 128 | |
| Beet, wild | *Beta procumbens* | 64 to 128 | |
| Brazilian pepper*<br>Christmasberry* | *Schinus terebinthifolius* | 96 to 128 | Also apply using 2% to 5% **Clearcast** per spray volume. |
| Buckwheat, wild | *Polygonum convolvulus* | 64 to 128 | |
| Buttercup | *Ranunculus* spp. | 64 to 128 | |
| California bulrush* | *Schoenoplectus californicus* | 64 to 128 | |
| Camphor tree* | *Cinnamomum camphora* | 2% to 5% v/v | |
| Canola, volunteer (non-**Clearfield** ®) | *Brassica campestris*<br>*Brassica napus* | 64 to 128 | |
| Cattail | *Typha* spp. | 32 to 64 | |
| Chickweed, common | *Stellaria media* | 64 to 128 | |
| Chinese tallowtree;<br>Popcorn tree | *Sapium sebiferum* | 64 to 128 | See *Special Weed Control* section. |
| Cocklebur, common | *Xanthium Strumarium* | 64 to 128 | |
| Filaree, redstem<br>Filaree, whitestem | *Erodium cicutarium*<br>*Erodium moschatum* | 64 to 128 | |
| Flixweed | *Descurainia sophia* | 64 to 128 | |
| Giant ragweed** | *Ambrosia trifida* | 32 to 64 | |
| Henbit | *Lamium amplexicaule* | 64 to 128 | |
| Jamaican nightshade* | *Solanum jamaicense* | 2% to 5% v/v | |
| Japanese stiltgrass | *Microstegium vimineum* | 32 to 64 | Use MSO at 1% by spray volume. **Clearcast** will provide some residual control of subsequent seedling emergence. |
| Jimsonweed | *Datura stramonium* | 64 to 128 | |
| Johnsongrass, rhizome<br>Johnsongrass, seedling | *Sorghum halepense* | 32 to 64<br>16 to 32 | |
| Knotweed, prostrate | *Polygonum aviculare* | 64 to 128 | |
| Kochia | *Kochia scoparia* | 64 to 128 | |
| Lambsquarters, common | *Chenopodium album* | 64 to 128 | |
| Lettuce, miner's | *Montia perfoliata* | 64 to 128 | |
| Mallow, common<br>Mallow, Venice | *Malva neglecta*<br>*Hibiscus trionum* | 64 to 128 | |
| Mustard spp. | *Brassica* spp. | 64 to 128 | |
| Nettle, burning | *Urtica urens* | 64 to 128 | |
| Nettleleaf goosefoot | *Chenopodium murale* | 64 to 128 | |
| Nightshade, black<br>Nightshade, Eastern black<br>Nightshade, hairy | *Solanum nigrum*<br>*Solanum ptycanthum*<br>*Solanum sarrachoides* | 64 to 128 | |
| Old world climbing fern* | *Lygodium microphyllum* | 5% v/v | |



*(continued)*

| Weeds Controlled *(continued)* | | | |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Rate Foliar** (fl ozs/A) | **Comments** |
| Pennycress,field | *Thlaspi arvense* | 64 to 128 | |
| Phragmites* | *Phragmites australis* | 64 to 128 | Use 1 qt/A methylated seed oil (MSO); apply in late vegetative stage up to killing frost. Also apply as a spot treatment using 1% to 2% **Clearcast® Herbicide** per spray volume. Older stands of phragmites and stands growing in water may be more difficult to control and will require follow-up applications. |
| Pigweed, prostrate<br>Pigweed, redroot<br>Pigweed, smooth<br>Pigweed, spiny | *Amaranthus blitoides*<br>*Amaranthus retroflexus*<br>*Amaranthus hybridus*<br>*Amaranthus spinosus* | 64 to 128 | |
| Puncturvine | *Tribulus terrestris* | 64 to 128 | |
| Purple loosestrife* | *Lythrum salicaria* | 32 to 64 | |
| Purslane, common | *Portulaca oleracea* | 64 to 128 | |
| Radish, wild | *Raphanus raphanistrum* | 64 to 128 | |
| Ragweed, common<br>Ragweed, giant | *Ambrosia artemisiifolia*<br>*Ambrosia trifida* | 64 to 128 | |
| Rocket, London<br>Rocket, yellow | *Sisymbrium irio*<br>*Barbarea vulgaris* | 64 to 128 | |
| Saltcedar* | *Tamarix* spp. | 64 to 128 | Also apply using 2% to 5% **Clearcast** and 1% MSO per spray volume. |
| Sedge*, purple<br>Sedge*, yellow | Cyperus rotundus<br>Cyperus esculentus | 32 to 64 | Also apply using 2% to 5% **Clearcast** per spray volume. |
| Shepherd's-purse | *Capsella bursa-pastoris* | 64 to 128 | |
| Smartweed, ladysthumb<br>Smartweed, Pennsylvania<br>Smartweed, swamp | *Polygonum persicaria*<br>*Polygonum pensylvanicum*<br>*Polygonum coccineum* | 64 to 128 | |
| Spike rush* | *Eleocharis* spp. | 64 to 128 | |
| Spurge, prostrate | *Euphorbia maculata* | 64 to 128 | |
| Sunflower, common | *Helianthus annuus* | 64 to 128 | |
| Swinecress | *Coronopus didymus* | 64 to 128 | |
| Tansymustard, green | *Descurainia pinnata* | 64 to 128 | |
| Taro | *Taro* spp. | 64 to 128<br>5% v/v | |
| Thistle, Russian | *Salsola iberica* | 64 to 128 | |
| Tropical soda apple* | *Solanum viarum* | 2% to 5% v/v | |
| Water primrose | *Ludwigia* spp. | 32 to 64 | Addition of **AquaPro™** herbicide will improve efficacy. |
| Wetland nightshade* | *Solanum tampicense* | 2% to 5% v/v | |
| Whitetop*<br>Hoary cress* | *Cardaria draba* | 8 to 16 | |
| Willoweed panicle | *Epilobium brachycarpum* | 64 to 128 | |
| Velvetleaf | *Abutilon theophrasti* | 64 to 128 | |
| * Use not permitted in California unless otherwise directed by supplemental labeling<br>** Suppression of larger, well-established plants | | | |

In general, the use of methylated seed oil (MSO) at 1% v/v will provide the best control with foliar applications.

**Special Weed Control - Chinese tallowtree**

**Clearcast** at 64 to 128 fl ozs/A or 0.5 to 2.0% v/v may be applied as a foliar application for selective control of Chinese tallowtree in and around tolerant tree species. Control Chinese tallowtree with foliar applications using aerial, handgun, or backpack application methods. When treating Chinese tallowtree, ensure that application method and spray volume provide adequate coverage of targeted Chinese tallowtree plants. Add methylated seed oil at 32 fl ozs/A for broadcast applications, or at 1% v/v for spot backpack and handgun applications. Tolerant hardwood species may exhibit varying degrees of leaf discoloration and temporary injury.

**Areas that may be Grazed or Cut for Hay**

Apply **Clearcast** to listed aquatic and terrestrial noncrop sites that may be grazed or cut for hay at a maximum use rate of 1 gallon per acre of **Clearcast** or 5% (v/v) spray solution for spot treatments. There are no grazing or haying restrictions.

## TERMS AND CONDITIONS OF USE

If terms of the following *Warranty Disclaimer, Inherent Risks of Use* and *Limitation of Remedies* are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, to the extent consistent with applicable law, use by the buyer or any other user constitutes acceptance of the terms under *Warranty Disclaimer, Inherent Risks of Use,* and *Limitation of Remedies.*

## WARRANTY DISCLAIMER

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

## INHERENT RISKS OF USE

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation or the seller. To the extent consistent with applicable law, all such risks shall be assumed by buyer.

## LIMITATION OF REMEDIES

To the extent consistent with applicable law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

(1) Refund of purchase price paid by buyer or user for product bought, or
(2) Replacement of amount of product used.

To the extent consistent with applicable law, SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer, Inherent Risks of Use* and this *Limitation of Remedies* cannot be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or this *Limitation of Remedies* in any manner.

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® **AquaPro** is a registered trademark of SePRO Corporation.

Manufactured for:
SePRO Corporation
11550 N. Meridian St., Ste. 600
Carmel, IN 46032

**SePRO Corporation**
11550 North Meridian Street, Suite 600
Carmel, IN 46032 U.S.A.

# Supplemental Label

**Clearcast®**
HERBICIDE

**EPA Reg. No. 241-437-67690**

This supplemental label expires December 31, 2014, and must not be used or distributed after this date.

**Active Ingredient:**

| | |
|---|---|
| ammonium salt of imazamox: 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid* | 12.1% |
| **Other Ingredients:** | 87.9% |
| **Total:** | 100.0% |

*Equivalent to 11.4% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-(methoxymethyl)-3-pyridinecarboxylic acid

1 gallon contains 1.0 pound of active ingredient as the free acid.

**Directions For Use**

- It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.
- The supplemental labeling and the entire **Clearcast® herbicide** container label, EPA Reg. No. 241-437-67690, must be in possession of the user at the time of application.
- Read the label affixed to the container for **Clearcast** before applying.
- Use of **Clearcast** according to this labeling is subject to the use precautions and limitations imposed by the label affixed to the container for **Clearcast**.

**Aquatic Weeds Controlled**

**Emergent, Floating, and Shoreline Species Controlled with Foliar Application**

| Common Name | Scientific Name | Rate (fl ozs/A) | Comments |
|---|---|---|---|
| Alligatorweed | *Alternanthera philoxeroides* | 64 to 128 | Repeat applications may be necessary. Add 1 qt/A of **AquaPro™ herbicide** for quicker brownout. |
| American lotus | *Nelumbo lutea* | 64 to 128 | |
| Arrowhead | *Sagittaria* spp. | 32 to 64 | |

| Common Name | Scientific Name | Rate (fl ozs/A) | Comments |
|---|---|---|---|
| Cattail | *Typha* spp. | 32 to 64 | Apply after full greenup through killing frost. |
| Chinese tallowtree | *Sapium sebiferum* | 64 to 128 | |
| Common reed | *Phragmites* spp. | 96 to 128 | Use 1 qt/A methylated seed oil (MSO); apply in late vegetative stage up to killing frost. Also apply as a spot treatment using 1% to 2% **Clearcast®** **herbicide** per spray volume. Older stands of phragmites and stands growing in water may be more difficult to control and will require follow-up applications. |
| Common salvinia | *Salvinia minima* | 32 to 64 | Apply with MSO or MSO + silicone-based surfactant; retreatment will be necessary. |
| Floating heart | *Nymphoides* spp. | 64 to 128 | Also apply as a spot treatment using 2% to 5% **Clearcast** and 1% MSO per spray volume. |
| Floating pennywort | *Hydrocotyle ranunculoides* | 32 to 64 | Repeat applications may be necessary. |
| Flowering rush | *Butomus umbellatus* | 64 to 128 | |
| Four-leaf clover | *Marsilea* spp. | 32 to 64 | |
| Frog's bit | *Lymnobium spongia* | 16 to 32 | |
| Giant cane | *Arundo donax* | 64 to 128 | |
| Japanese knotweed | *Polygonum cuspidatum* | 64 to 128 | |
| Mexican lily | *Nymphaea mexicana* | 32 to 64 | |
| Mosquito fern | *Azolla* spp. | — | Apply using 2% to 5% **Clearcast** and 1% MSO by volume. |
| Parrotfeather | *Myriophyllum aquaticum* | 64 to 128 | Apply only to emergent vegetation. |
| Pickerelweed | *Pontederia cordata* | 32 to 64 | |
| Saltcedar | *Tamarix* spp. | 64 to 128 | Also apply using 2% to 5% **Clearcast** and 1% MSO per spray volume. |

| Common Name | Scientific Name | Rate (fl ozs/A) | Comments |
|---|---|---|---|
| Smartweed, ladysthumb Smartweed, Pennsylvania Smartweed, swamp | *Polygonum persicaria* *Polygonum pensylvanicum* *Polygonum coccineum* | 64 to 128 | |
| Spatterdock | *Nuphar lutea* | 64 to 128 | |
| Variable-leaf milfoil | *Myriophyllum heterophyllum* | 64 to 128 | Apply with MSO (1% v/v) as an emergent foliar treatment when plants have emerged on the surface. Also apply as a spot treatment using 1% to 3% **Clearcast** per spray volume. |
| Water chestnut | *Trapa natans* | 64 to 128 | Apply with MSO to emergent part of plant. Also apply as a spot treatment using 2% to 5% **Clearcast® herbicide** per spray volume. |
| Water hyacinth | *Eichhornia crassipes* | 16 to 32 | |
| Water lettuce | *Pistia stratiotes* | 48 to 96 | |
| Water lily | *Nymphaea* spp. | 32 to 64 | |
| Water primrose | *Ludwigia* spp. | 32 to 64 | Add 1 qt/A of **AquaPro™ herbicide** for quicker brownout. |
| Watershield | *Brasenia schreberi* | 48 to 64 | |
| Wild taro | *Colocasia esculenta* | 96 to 128 | |

**Species Susceptible to Water-injected Applications**

The following categories are provided to define species that may be growth regulated or controlled with 50 to 500 ppb **Clearcast** following in-water applications: susceptible, moderately susceptible, and less susceptible. The rates associated with each susceptibility category, including the **Special Weed Control** section, are provided as guidance with the overriding allowance that an application rate from 50 to 500 ppb may be used depending on the aquatic vegetation management objective and the characteristics of the aquatic vegetation and water body being treated.

Some species that are susceptible to foliar applications of **Clearcast** may be less susceptible to in-water applications. Use of higher rates are necessary to achieve desired control/suppression in areas of greater water exchange; when treating more mature or less susceptible plants; when targeting more difficult-to-control aquatic species; and when treating small areas in larger bodies of water (partial or spot treatments). Lower concentrations are generally used when conducting early season large-scale treatments; when greater selectivity is desired; and treating larger areas, more immature or susceptible plants, and areas with less potential for rapid water exchange.

Use of lower rates may increase selectivity on some species within the same category. Effects on susceptible plants can range from control to growth regulation depending on treatment site characteristics, exposure time, and application rate. Susceptible plant species may exhibit herbicide stress or reduced growth during active treatment phases. Whole lake applications with lower rates may provide plant growth regulation or greater selectivity while higher rates will generally provide broader activity.

**Susceptible Vascular Aquatic Plants (50 to 200 ppb)**

| Common Name | Scientific Name |
|---|---|
| Curlyleaf pondweed | *Potamogeton crispus* |
| Eurasian watermilfoil | *Myriophyllum spicatum* |
| Hydrilla | *Hydrilla verticillata* |
| Sago pondweed | *Stuckenia pectinata* |
| Water hyacinth | *Eichhornia crassipes* |
| Water stargrass | *Heteranthera dubia* |

**Moderately Susceptible Vascular Aquatic Plants (100 to 300 ppb)**

| Common Name | Scientific Name |
|---|---|
| American pondweed | *Potamogeton nodosus* |
| Bladderwort | *Utricularia* spp. |
| Frog's bit | *Lymnobium spongia* |
| Illinois pondweed | *Potamogeton illinoensis* |
| Pickerelweed | *Pontederia cordata* |
| Salvinia | *Salvinia* spp. |
| Spikerush | *Eleocharis baldwinii* |
| Variable-leaf milfoil | *Myriophyllum heterophyllum* |
| Wigeon grass | *Ruppia maritima* |

**Less Susceptible Vascular Aquatic Plants (200 to 500 ppb)**

| Common Name | Scientific Name |
|---|---|
| Bulrush | *Schoenoplectus californicus* |
| Cattail | *Typha* spp. |
| Coontail | *Ceratophyllum demersum* |
| Egeria | *Egeria densa* |
| Flowering rush | *Butomus umbellatus* |
| Southern naiad | *Najas guadalupensis* |
| Spatterdock | *Nuphar lutea* |
| Water lily | *Nymphaea odorata* |
| Watershield | *Brasenia schreberi* |

**Special Weed Control**

**Eurasian Watermilfoil.** Apply **Clearcast® herbicide** at 100 to 200 ppb to actively growing plants early in the growing season. Applications made to mature Eurasian watermilfoil (vegetation topped out) may require multiple applications.

**Hydrilla.** Apply **Clearcast** at 150 to 200 ppb to actively growing plants early in the growing season. Applications made prior to topped-out hydrilla may require repeat application. A single application of 50 to 75 ppb can be used to suppress and growth- regulate hydrilla for up to 10 to 12 weeks. If desired, an additional 50 to 75 ppb can be applied to extend the period of growth suppression when normal hydrilla growth resumes.

**Sago Pondweed.** In dry ditches (drainage and irrigation), sago pondweed may be controlled or growth-suppressed with soil-applied **Clearcast** at 64 to 128 fl ozs/A. In irrigation canals, apply **Clearcast** after drawdown and prior to water recharge.

## TERMS AND CONDITIONS OF USE

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## WARRANTY DISCLAIMER

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

## INHERENT RISKS OF USE

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation or the seller. To the extent consistent with applicable law, all such risks shall be assumed by buyer.

## LIMITATION OF REMEDIES

To the extent consistent with applicable law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

(1) Refund of purchase price paid by buyer or user for product bought, or
(2) Replacement of amount of product used.

To the extent consistent with applicable law, SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer*, *Inherent Risks of Use* and this *Limitation of Remedies* cannot be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or this *Limitation of Remedies* in any manner.

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Manufactured for: SePRO Corporation; 11550 N. Meridian St., Ste. 600, Carmel, IN 46032
NVA 2011-04-299-0233

# Material Safety Data Sheet

Transportation and Medical Emergency Phone: **1-800-535-5053 (INFOTRAC)**
General Phone: 317-580-8282

EPA Reg. Number: 241-437-67690
Creation Date: 03/08/2010

# Clearcast® Herbicide

**SePRO Corporation** 11550 North Meridian Street, Suite 600, Carmel, IN 46032-4565

## 1. PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT:** Clearcast® Herbicide

**Molecular Formula:** $C_{15}H_{18}N_3O_4.NH(4)$
**Chemical Family:** imidazole derivative
**Synonyms:** ammonium salt of imazamox

**COMPANY IDENTIFICATION:**
SePRO Corporation
11550 North Meridian Street, Suite 600
Carmel, IN 46032-4565
**www.sepro.com**
**Information Phone:** 317-580-8282 (Mon - Fri, 8 am to 5 pm EST)

## 2. HAZARDS IDENTIFICATIONS

**EMERGENCY OVERVIEW**
CAUTION
- Harmful if absorbed through skin.
- Harmful if inhaled.
- Keep out of reach of children.
- Keep out of reach of domestic animals.
- Avoid contact with the skin, eyes and clothing.
- Avoid inhalation of mists/vapors.

*See Product Label for additional precautionary statements.*

**State of Matter:** liquid
**Color:** pale yellow, clear
**Odor:** acidic

**Potential Health Effects**
**Primary Routes of Exposure:** Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

**Acute Toxicity:** Relatively nontoxic after single ingestion. Slightly toxic after short-term skin contact. Relatively nontoxic after short-term inhalation.

**Irritation/Corrosion:** May cause slight irritation to the skin. May cause moderate but temporary irritation to the eyes.

**Potential Environmental Effects**
**Aquatic Toxicity:** There is a high probability that the product is not acutely harmful to aquatic organisms.

**Terrestrial Toxicity:** With high probability not acutely harmful to terrestrial organisms.

**EMERGENCY PHONE NUMBER:**
**1-800-535-5053**

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

| Chemical Name | % by Wt. |
|---|---|
| Ammonium salt of imazamox (CAS# 247057-22-3) | 12.1% |

Components not precisely identified are proprietary or not hazardous.

## 4. FIRST AID MEASURES

**General Advice:** First aid providers should wear personal protective equipment to prevent exposure. Remove contaminated clothing. Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or physician for treatment advice. Have the product container or label with you when calling a poison control center or doctor or going for treatment.

**If Inhaled:** Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary.

**If on Skin:** Rinse skin immediately with plenty of water for 15 - 20 minutes.

**If in Eyes:** Hold eyes open and rinse slowly and gently with water for 15 - 20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing.

**If Swallowed:** Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control center or doctor. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions.

**Note to Physician**
**Antidote:** No known specific antidote.
**Treatment:** Treat symptomatically.

## 5. FIRE FIGHTING MEASURES

**Flash Point & Method:** Based of the high water content the determination of the flash point seems not to be necessary.

**Flammable Limits:** Not determined. Slightly flammable in the presence of open flames, sparks, static charge and heat.

**Auto-Ignition Temperature:** Not applicable.

**Self-Ignition Temperature:** Based on the water content the product does not ignite.

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Transportation and Medical Emergency Phone: **1-800-535-5053 (INFOTRAC)**
General Phone: 317-580-8282

EPA Reg. Number: 241-437-67690
Creation Date: 03/08/2010

# Clearcast® Herbicide

**SePRO Corporation** 11550 North Meridian Street, Suite 600, Carmel, IN 46032-4565

**Extinguishing Media:** Use foam, dry extinguishing media, carbon dioxide, water spray.

**Firefighting Equipment:** Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

**Hazards During Fire-Fighting:** Carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, ammonium, hydrocarbons. If product is heated above decomposition temperature, toxic vapors will be released. The substances/ groups of substances mentioned can be released if the product is involved in a fire.

**Further Information:** Evacuate area of all unnecessary personnel. Contain contaminated water/firefighting water. Do not allow to enter drains or waterways.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

**Environmental Precautions:** Do not discharge into the subsoil/ soil. Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

**Cleanup:** Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

Report large spills to **INFOTRAC** and consult SePRO Corporation for assistance.

## 7. HANDLING AND STORAGE

**Handling Information**

**General Advice:** *Recommendations Are For Manufacturing, Commercial Blending, And Packaging Workers.*

Pesticide applicators & workers must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170.

- Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary).
- Keep away from sources of ignition. No smoking.
- Keep container tightly sealed.
- Protect contents from the effects of light. Protect against heat. Protect from air.
- Handle and open container with care. Do not open until ready to use. Once container is opened, content should be used as soon as possible.
- Avoid aerosol formation. Avoid dust formation.
- Provide means for controlling leaks and spills.
- Do not return residues to the storage containers.
- Follow label warnings even after container is emptied. The substance/product may be handled only by appropriately trained personnel.
- Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/ vapors.
- Wear suitable personal protective clothing and equipment.

**Protection Against Fire and Explosion:** The relevant fire protection measures should be noted. Fire extinguishers should be kept handy. Avoid all sources of ignition: heat, sparks, open flame. Sources of ignition should be kept well clear. Avoid extreme heat. Keep away from oxidizable substances. Electrical equipment should conform to national electric code. Ground all transfer equipment properly to prevent electrostatic discharge. Electrostatic discharge may cause ignition.

**Storage Information**

**General Advice:** Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed.

**Storage Incompatibility:** Segregate from incompatible substances. Segregate from foods and animal feeds. Segregate from textiles and similar materials.

**Storage Stability:** If substance/product crystallizes thaw at room temperature.

**Temperature Tolerance:** Protect from temperatures below 0°C. Changes in the properties of the product may occur if substance/ product is stored below indicated temperature for extended periods of time. Protect from temperatures above 40°C. Changes in the

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properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Users of a pesticidal product should refer to the product label for personal protective equipment requirements.**

**Advice on System Design:** Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

**Personal Protective Equipment**

**RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS**

**Respiratory Protection:** Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) TC23C Chemical/Mechanical type filter system to remove a combination of particles, gas and vapors. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full facemask pressure demand self-contained breathing apparatus (SCBA) or a full facemask pressure demand supplied-air respirator (SAR) with escape provisions.

**Hand Protection:** Chemical resistant protective gloves. Protective glove selection must be based on the user's assessment of the workplace hazards.

**Eye Protection:** Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

**Body Protection:** Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

**General Safety and Hygiene Measures**

- Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment.
- Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice.
- Personal protective equipment should be decontaminated prior to reuse.
- Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks).
- Take off immediately all contaminated clothing. Store work clothing separately.
- Hands and/or face should be washed before breaks and at the end of the shift.
- No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Form:** liquid
**Odor:** acidic, mild
**Color:** pale yellow, clear
**pH Value:** 6.0 - 6.1
**Freezing Point:** approximately 0°C (1,013.3 hPa) [Information applies to the solvent.]
**Boiling Point:** approximately 100°C (1,013.3 hPa) [Information applies to the solvent.]
**Vapor Pressure:** approximately 23.3 hPa (20°C) [Information applies to the solvent.]
**Density:** 1.0486 g/cm$^3$ (20°C)
**Relative Density:** 1.05
**Bulk Density:** not applicable
**Partitioning coefficient n-octanol/ water (log Pow):** not applicable
**Viscosity, dynamic:** 3.7 mPa.s
**Molar Mass:** 322.4 g/mol

## 10. STABILITY AND REACTIVITY

**Stability:** The product is chemically stable. No hazardous reactions if stored and handled as prescribed/indicated.

**Incompatibility (specific conditions/materials to avoid):** Oxidizing agents.

**Hazardous Decomposition Products:** No hazardous decomposition products if stored and handled as prescribed/ indicated. Prolonged thermal loading can result in products of degradation being given off.

**Thermal Decomposition:** Possible thermal decomposition products: carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, ammonium, hydrocarbons. Stable at ambient temperature. If product is heated above decomposition temperature toxic vapors/hazardous fumes may be released.

**Corrosion to Metals:** Corrosive effects to metal are not anticipated.

**Oxidizing Properties:** Not an oxidizer.

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## 11. TOXICOLOGICAL INFORMATION

**Acute Toxicity**
**Oral ($LD_{50}$, rat):** >5,000 mg/kg
**Inhalation ($LC_{50}$, rat - 4 hr):** >5 mg/l
**Dermal ($LD_{50}$, rat):** >4,000 mg/kg

**Irritation/Corrosion**
**Skin (rabbit):** Non-irritant
**Eye (rabbit):** Non-irritant
**Sensitization (guinea pig):** Modified Buehler test. Skin sensitizing effects were not observed in animal studies.

**The below information is on the active ingredient, imazamox.**

**Genetic Toxicity:** No mutagenic effect was found in various tests with microorganisms and mammals.

**Carcinogenicity:** In long-term studies in rats and mice in which the substance was given by feed, a carcinogenic effect was not observed.

**Reproductive Toxicity:** The results of animal studies gave no indication of a fertility impairing effect.

**Development:** No indications of a developmental toxic/ teratogenic effect were seen in animal studies.

## 12. ENVIRONMENTAL INFORMATION

**The below information is on the active ingredient, imazamox.**

**Fish Acute $LC_{50}$ (96 hr):** *Oncorhynchus mykiss* ≥122 ppm

**Aquatic Invertebrate Acute $EC_{50}$:** *Daphnia magna* >122 ppm

**Aquatic Plant $EC_{50}$ (120 hr):** Algae > 0.037 mg/l

**Other Terrestrial Non-Mammals:**
**Mallard duck $LC_{50}$:** >5,572 ppm
**Honey bee $LC_{50}$:** >100 ug/bee

**Degradability/Persistence/Biological/Abiological Degradation:** Not readily biodegradable (by OECD criteria).

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal of Substance:** Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Container Disposal:** Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

**RCRA:** This product is not regulated by RCRA.

## 14. TRANSPORT INFORMATION

**DOT:** Not regulated.

## 15. REGULATORY INFORMATION

**NOTICE:** The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations.

**U.S. Regulations**

**Registration Status:**
Chemical TSCA: US blocked / not listed
Crop Protection TSCA: US released / exempt

**OSHA Hazard Category:** Not hazardous

**EPCRA 311/312 (Hazard Categories):** Not hazardous

**State Regulations**

**CA Prop. 65:** There are no listed chemicals in this product.

## 16. OTHER INFORMATION

**MSDS STATUS:** Creation Date – 03/08/2010
(BASF090409)

The information in this Material Safety Data Sheet relates to this specific material. It may not be valid for this material if used in combination with any other materials or in any process. It is the users' responsibility to satisfy themselves as to the suitability and completeness of this information for their own particular use.

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY, EXPRESS OR IMPLIED, IS MADE. CONSULT SEPRO CORPORATION FOR FURTHER INFORMATION.

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# Diquat (Reward) Label, Pending CA Label and MSDS

PULL HERE TO OPEN

# REWARD®

## *Landscape and Aquatic Herbicide*

***TO PREVENT ACCIDENTAL POISONING, NEVER PUT INTO FOOD, DRINK, OR OTHER CONTAINERS, AND USE STRICTLY IN ACCORDANCE WITH ENTIRE LABEL.***

***DO NOT USE THIS PRODUCT FOR REFORMULATION.***

| | |
|---|---|
| *Active Ingredient:* | |
| Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2',1'-c) pyrazinediium dibromide] | 37.3% |
| *Other Ingredients:* | 62.7% |
| *Total:* | 100.0% |

*Contains 2 lbs. diquat cation per gal. (3.73 lbs. diquat dibromide per gal.)*

***KEEP OUT OF REACH OF CHILDREN.***

## *WARNING/AVISO*

*Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)*

*See additional precautionary statements on label.*

*EPA Reg. No. 100-1091*
*EPA Est. 100-TX-001*

*Product of United Kingdom*
*Formulated in the USA*

***SCP 1091A-L2C 0605***

**2.5 gallons**
**Net Contents**

syngenta

SCP 130-1091A-L2C

| FIRST AID | |
|---|---|
| **If on skin or clothing** | • Take off contaminated clothing.<br>• Rinse skin immediately with plenty of water for 15-20 minutes.<br>• Call a poison control center or doctor for treatment advice. |
| **If in eyes** | • Hold eye open and rinse slowly and gently with water for 15-20 minutes.<br>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.<br>• Call a poison control center or doctor for treatment advice. |
| **If swallowed** | • Call a poison control center or doctor immediately for treatment advice.<br>• Have person sip a glass of water if able to swallow.<br>• Do not induce vomiting unless told to do so by the poison control center or doctor.<br>• Do not give anything by mouth to an unconscious person. |
| **If inhaled** | • Move person to fresh air.<br>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.<br>• Call a poison control center or doctor for further treatment advice. |
| **NOTE TO PHYSICIANS**<br>To be effective, treatment for diquat poisoning must begin **IMMEDIATELY**. Treatment consists of binding diquat in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination, and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis. | |
| Have the product container or label with you when calling a poison control center or doctor, or going for treatment. | |
| **HOTLINE NUMBER**<br>For 24-Hour Medical Emergency Assistance (Human or Animal) or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident), Call<br>**1-800-888-8372** | |

## PRECAUTIONARY STATEMENTS

**Hazards to Humans and Domestic Animals**

**WARNING / AVISO**

May be fatal if absorbed through skin. Harmful if swallowed or inhaled. Causes substantial, but temporary, eye injury. Causes skin irritation. Contact with irritated skin, or a cut, or repeated contact with intact skin may result in poisoning. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mist. Do not feed forage from treated crops to livestock. Keep livestock and pets out of treated fields and crop areas.

### Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are: barrier laminate, butyl rubber ≥14 mils, nitrile rubber ≥14 mils. If you want more options, follow the instructions for Category A on an EPA Chemical Resistance Category Selection Chart.

**Mixers, Loaders, Applicators and other handlers must wear:**

- Coveralls over short-sleeved shirt and short pants or coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing, or loading
- Face shield when mixing or loading

**Exception:** After this product has been diluted to 0.50% Reward or less in water (i.e., the labeled rate for some spot applications), applicators for AQUATIC SURFACE APPLICATIONS must, at a minimum, wear (Note - Mixers and Loaders for this application method must still wear the personal protective equipment (PPE) as described in the above section):

- Long-sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves
- Protective eyewear

**Exception:** At a minimum, applicators for AQUATIC SUBSURFACE APPLICATIONS must wear (Note - Mixers and Loaders for this application method must still wear the personal protective equipment (PPE) as described in the above section):

- Short-sleeved shirt and short pants
- Waterproof gloves
- Chemical-resistant footwear plus socks

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### Engineering Control Statements

Mixers and loaders supporting aerial applications are required to use closed systems that provide dermal protection. The closed system must be used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4)]. When using the closed system, mixers and loaders' PPE requirements may be reduced or modified as specified in the WPS.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

### User Safety Recommendations

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Prolonged contact of the product with the skin may produce burns.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### Environmental Hazards

This pesticide is toxic to aquatic invertebrates. **For Terrestrial Uses,** do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water. **For Aquatic Uses** do not apply directly to water except as specified on this label.

## CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product should be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of SYNGENTA CROP PROTECTION, Inc. or Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

SYNGENTA warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of the product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or SYNGENTA, and Buyer and User assume the risk of any such use. SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

In no event shall SYNGENTA or Seller be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF SYNGENTA AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF SYNGENTA OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

SYNGENTA and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of Sale and Limitations of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of SYNGENTA.

# DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

**READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.**

**Do not apply this product through any type of irrigation system.**

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.**

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls over short-sleeved shirt and short pants, or coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure

### NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

**Keep all unprotected persons out of operating areas or vicinity where there may be drift.**

**For terrestrial uses**, do not enter or allow entry of maintenance workers into treated areas, or allow contact with treated vegetation wet with spray, dew, or rain, without appropriate protective clothing until spray has dried.

**For aquatic uses,** do not enter treated areas while treatments are in progress.

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

### Pesticide Storage

Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not contaminate feed, foodstuffs, or drinking water. Do not store or transport near feed or food. Store at temperatures above 32°F. For help with any spill, leak, fire, or exposure involving this material, call **1-800-888-8372**.

### Pesticide Disposal

Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

### Container Disposal

Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

### For Bulk And Mini-Bulk Containers

When the container is empty, replace the cap and seal all openings that have been opened during use and return the container to the point of purchase, or to a designated location named at the time of purchase of this product. This container must be refilled with this pesticide product. **DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE.** Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting. Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, contact Syngenta Crop Protection at 1-800-888-8372. If not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling. Disposal of this container must be in compliance with state and local regulations.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

**CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER!**

## SPECIFIC USE DIRECTIONS

Reward Landscape and Aquatic Herbicide is a nonvolatile herbicidal chemical for use as a general herbicide to control weeds in commercial greenhouses and nurseries; ornamental seed crops (flowers, bulbs, etc. – except in the state of California); landscape, industrial, recreational, commercial, residential, and public areas; turf renovation (all turf areas except commercial sod farms); dormant established turfgrass (bermudagrass, zoysiagrass – nonfood or feed crop); and aquatic areas. Absorption and herbicidal action is usually quite rapid with effects visible in a few days. Reward Landscape and Aquatic Herbicide controls weeds by interfering with photosynthesis within green plant tissue. Weed plants should be succulent and actively growing for best results. Rinse all spray equipment thoroughly with water after use. Avoid spray drift to crops, ornamentals, and other desirable plants during application, as injury may result. Application to muddy water may result in reduced control. Minimize creating muddy water during application. Use of dirty or muddy water for Reward Landscape and Aquatic Herbicide dilution may result in reduced herbicidal activity. Avoid applying under conditions of high wind, water flow, or wave action.

### SPRAY DRIFT MANAGEMENT

Avoiding spray drift at the application site is the responsibility of the applicator and the grower. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses, or to applications using dry formulations.

- The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees.

Where states have more stringent regulations, they should be observed.

### Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (See **Wind, Temperature and Humidity,** and **Temperature inversions**).

### Controlling Droplet Size

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

#### Boom Length

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

#### Application Height

Applications should not be made at a height greater than 10 ft. above the top of the target plants, unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

#### Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

#### Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

#### Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

**Temperature Inversions**

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog, however, if fog is not present inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

**Sensitive Areas**

The pesticide should only be applied when the wind is blowing away from adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops).

## COMMERCIAL GREENHOUSES AND NURSERIES

For general weed control in commercial greenhouses (beneath benches), field grown and container stock, and other similar areas, Reward Landscape and Aquatic Herbicide may be applied preplant or postplant preemergence in field grown ornamental nursery plantings or postemergence as a directed spray. Reward Landscape and Aquatic Herbicide may also be applied preemergence in ornamental seed crops (except in the state of California). Avoid contact with desirable foliage as injury may occur. Do not use on food or feed crops.

**Spot spray:** 1-2 qts. Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of water, or 0.75 oz. (22 mls.) Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water.

**Broadcast:** 1-2 pts. Reward Landscape and Aquatic Herbicide in a minimum of 15 gals. of water per acre. Add the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of spray mixture. Use an adequate spray volume to insure good coverage.

## ORNAMENTAL SEED CROPS (FLOWERS, BULBS, ETC.) EXCEPT IN THE STATE OF CALIFORNIA

For preharvest desiccation of ornamental seed crops. NOT FOR FOOD OR FIBER CROPS.

**Broadcast (Air or Ground):** 1.5-2 pts. Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per acre in sufficient water (minimum of 5 gals. by air; 15 gals. by ground) for desiccation and weed burndown. Repeat as needed at no less than 5-day intervals up to three applications. Do not use seed, screenings, or waste as feed or for consumption.

## DIRECTIONS FOR LANDSCAPE, INDUSTRIAL, RECREATIONAL, COMMERCIAL, RESIDENTIAL, AND PUBLIC AREAS

Reward Landscape and Aquatic Herbicide provides fast control of broadleaf and grassy weeds in industrial, recreational, golf course, commercial, residential, and public areas.

Reward Landscape and Aquatic Herbicide is a nonselective herbicide that rapidly kills undesirable above ground weed growth in 24-36 hours. Avoid application of Reward Landscape and Aquatic Herbicide to desirable plants.

Reward Landscape and Aquatic Herbicide is a contact/desiccant herbicide; it is essential to obtain complete coverage of the target weeds to get good control. Improper application technique and/or application to stressed weeds may result in unacceptable weed control. For best results, apply to actively growing, young weeds.

Difficult weeds (such as perennial or deeply-rooted weeds) can often be controlled by tank mixing Reward Landscape and Aquatic Herbicide with other systemic-type herbicides. Refer to other product labels for specific application directions.

For residual weed control, tank mix Reward Landscape and Aquatic Herbicide with a preemergent herbicide labeled for the intended use site. When mixing Reward Landscape and Aquatic Herbicide with another herbicide, it is recommended to mix just a small amount first to determine if the mixture is physically compatible before proceeding with larger volumes.

Syngenta has not tested all possible tank mixtures with other herbicides for compatibility, efficacy or other adverse effects. Before mixing with other herbicides Syngenta recommends you first consult your state experimental station, state university or extension agent.

**Grounds maintenance weed control:** Reward Landscape and Aquatic Herbicide can be used as a spot or broadcast spray to control weeds in public, commercial and residential landscapes, including landscape beds, lawns, golf courses and roadsides. Reward Landscape and Aquatic Herbicide can also be used for weed control around the edges and nonflooded portions of ponds, lakes and ditches.

**Trim and Edge weed control:** Reward Landscape and Aquatic Herbicide can be used to eliminate undesired grass and broadleaf plant growth in a narrow band along driveways, walkways, patios, cart paths, fence lines, and around trees, ornamental gardens, buildings, other structures, and beneath noncommercial greenhouse benches. Vegetation control with Reward Landscape and Aquatic Herbicide is limited to the spray application width. Do not exceed the labeled rate of Reward Landscape and Aquatic Herbicide as excessive rates may result in staining of concrete-based materials.

Reward Landscape and Aquatic Herbicide, since it does not translocate systemically, can be used as an edging or pruning tool when precisely applied to select areas of grass or to undesirable growth on desirable ornamental bedding plants, ground covers, etc.

**Industrial weed control:** Reward Landscape and Aquatic Herbicide can be used as a spot or broadcast spray either alone or in combination with other herbicides as a fast burndown or control weeds in rights-of-ways, railroad beds/yards, highways, roads, dividers and medians, parking lots, pipelines, pumping stations, public utility lines, transformer stations and substations, electric utilities, storage yards, and other non-crop areas.

**Spot spray:** Apply either 1-2 qts. of Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 100 gals. water, or 0.75 oz. (22 mls.) Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water.

**Broadcast:** 1-2 pts. Reward Landscape and Aquatic Herbicide per acre in sufficient water to insure good spray coverage. Add the labeled rate of 75% or greater nonionic surfactant per 100 gals. spray mixture. Greater water volumes are necessary if the target plants are tall and/or dense. It is recommended that 60 gals. or greater water volume be used to obtain good coverage of dense weeds.

## TURF RENOVATION (ALL TURF AREAS EXCEPT COMMERCIAL SOD FARMS)

To desiccate golf course turf and other turf areas prior to renovation, apply 1-2 pts. of Reward Landscape and Aquatic Herbicide per acre plus the labeled rate of a 75% or greater nonionic surfactant in 20-100 gals. of water (4 teaspoons of Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water) using ground spray equipment. Apply for full coverage and thorough contact with the turfgrass. Apply only when the turf is dry, free from dew and incidental moisture. For enhanced turf desiccation, especially in the case of thick turfgrass, water volumes should approach 100 gals. of water per acre.

For **suppression** of regrowth and quick desiccation of treated turfgrass, Reward Landscape and Aquatic Herbicide may be mixed with other systemic nonselective or systemic postemergence grassy weed herbicides. Refer to other product labels for specific application directions and restrictions.

Avoid spray contact with, or spray drift to, foliage of ornamental plants or food crops.

Do not graze livestock on treated turf or feed treated thatch to livestock.

## DORMANT ESTABLISHED TURFGRASS (BERMUDAGRASS, ZOYSIAGRASS), NONFOOD OR FEED CROP

For control of emerged annual broadleaf and grass weeds, including Little Barley*, Annual Bluegrass, Bromes including Rescuegrass, Sixweeks fescue, Henbit, Buttercup, and Carolina Geranium in established dormant bermudagrass lawns, parks, golf courses, etc.

Apply 1-2 pts. Reward Landscape and Aquatic Herbicide per acre in 20-100 gals. of spray mix by ground as a broadcast application. Add the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of spray mixture.

Bermudagrass must be dormant at application. Application to actively growing bermudagrass may cause delay or permanent injury. Users in the extreme Southern areas should be attentive to the extent of dormancy at the time of application.

*For control of Little Barley, apply Reward Landscape and Aquatic Herbicide prior to the mid-boot stage.

## AQUATIC USE DIRECTIONS

**New York – Not for Sale or Use in New York State without Supplemental Special Local Needs Labeling.**

Necessary approval and/or permits must be obtained prior to application if required. Consult the responsible State Agencies (i.e., Fish and Game Agencies, State Water Conservation authorities, or Department of Natural Resources).

Treatment of dense weed areas may result in oxygen loss from decomposition of dead weeds. This loss of oxygen may cause fish suffocation. Therefore, treat only 1/3 to 1/2 of the water body area at one time and wait 14 days between treatments.

For best results on submersed weeds, Reward Landscape and Aquatic Herbicide should be applied to actively growing (photosynthesizing) weeds when water temperatures have reached or exceeded approximately 50°F, typically during the Spring or early Summer.

For application only to **still water** (i.e. ponds, lakes, and drainage ditches) where there is minimal or no outflow to public waters.

and/or

For applications to **public waters** in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, streams, rivers, and other slow-moving or quiescent bodies of water for control of aquatic weeds. For use by:

- Corps of Engineers; or
- Federal or State Public Agencies (i.e., Water Management District personnel, municipal officials); or
- Applicators and/or Licensees (Certified for aquatic pest control) that are authorized by the State or Local government.

Treated water may be used according to the following table or until such time as an approved assay (example: PAM II Spectromatic Method) shows that the water does not contain more than the designated maximum contaminant level goal (MCLG) of 0.02 mg/l. (ppm) of diquat dibromide (calculated as the cation).

**Water Use Restrictions Following Applications With Reward Landscape And Aquatic Herbicide (Days)**

| Application Rate | Drinking | Fishing and Swimming | Livestock/ Domestic Animals Consumption | Spray Tank Applications** and Irrigation to Turf and Landscape Ornamentals | Spray Tank Applications** and Irrigation to Food Crops and Production Ornamentals |
|---|---|---|---|---|---|
| 2 gals./surface acre | 3 days | 0 | 1 day | 3 days | 5 days |
| 1 gal./surface acre | 2 days | 0 | 1 day | 2 days | 5 days |
| 0.75 gal. /surface acre | 2 days | 0 | 1 day | 2 days | 5 days |
| 0.50 gal./surface acre | 1 day | 0 | 1 day | 1 day | 5 days |
| **Spot Spray*** (< 0.5 gal./surface acre) | 1 day | 0 | 1 day | 1 day | 5 days |

*Add a nonionic surfactant (with at least 75% of the constituents active as a spray adjuvant) at the rate recommended by the manufacturer.

**For preparing agricultural sprays for food crops, turf or ornamentals (to prevent phytotoxicity), do not use water treated with Reward Landscape and Aquatic Herbicide before the specified time period.

When the contents of more than one spray tank is necessary to complete a single aquatic application, no water holding restrictions apply between the consecutive spray tanks.

No applications are to be made in areas where commercial processing of fish, resulting in the production of fish protein concentrate or fish meal, is practiced. Before application, coordination and approval of local and/or State authorities must be obtained.

## Floating and Marginal Weeds Including:

Water lettuce, *Pistia stratiotes*
Water hyacinth, *Eichhornia crassipes*
Duckweed, *Lemna* spp.
Salvinia spp. (including *S. molesta*)
Pennywort (*Hydrocotyle* spp.)
Frog's Bit[1], *Limnobium spongia*
Cattails, *Typha* spp.

[1]Not for use in California

Reward Landscape and Aquatic Herbicide may be applied by backpack, airboat, spray handgun, helicopter, airplane, or similar application equipment that results in thorough spray coverage.

**Spot Treatment:** Apply Reward Landscape and Aquatic Herbicide at 2 quarts per 100 gallons spray carrier (0.5% solution) with an approved aquatic wetting agent at 0.25-1.0% v/v (1 quart to 1 gallon per 100 gallons water). For cattail control, Reward Landscape and Aquatic Herbicide should be applied prior to flowering at the maximum application rate (8 quarts of Reward Landscape and Aquatic Herbicide/100 gallons spray carrier) plus the wetting agent. Repeat treatments may be necessary for complete control.

Spray to completely wet target weeds but not to runoff. Densely packed weeds or mats may require additional applications due to incomplete spray coverage. Re-treat as needed. For best results, re-treat weed escapes within 2 weeks of the initial treatment.

**Broadcast Treatment:** Apply Reward Landscape and Aquatic Herbicide at the rate of 0.5-2.0 gallons per surface acre in sufficient carrier along with 16-32 oz./A of an approved wetting agent. Re-treat as necessary for densely populated weed areas. Good coverage is necessary for control of the target weeds.

For duckweed control, apply Reward Landscape and Aquatic Herbicide at 1-2 gallons/A.

## Submersed Weeds Including:

Bladderwort, *Utricularia* spp.
Hydrilla, *Hydrilla verticillata*
Watermilfoils (including Eurasian), *Myriophyllum* spp.
Pondweeds[1], *Potamogeton* spp.
Coontail, *Ceratophyllum demersum*
Elodea, *Elodea* spp.
Brazilian Elodea, *Egeria densa*
Naiad, *Najas* spp.
Algae[2], *Spirogyra* spp. and *Pithophora* spp.

[1]Reward Landscape and Aquatic Herbicide controls *Potamogetan* species except Richardson's pondweed, *P. richardsonii*.

[2]Suppression only. For control of *Spirogyra* and/or *Pithophora*, use Reward Landscape and Aquatic Herbicide in a tank mix with an approved algaecide.

# Reward® Landscape and Aquatic Herbicide

For severe weed or algae infestations, the use of an approved algaecide either as a pretreatment to the Reward Landscape and Aquatic Herbicide application or in a tank mix, may result in enhanced weed control.

To control submersed weeds, apply Reward Landscape and Aquatic Herbicide in water at 0.5-2.0 gallons per surface acre (per 4 foot water depth). For severe weed infestations, use the 2.0 gallon per surface acre rate. For best results, re-treat as necessary on 14-21 day intervals. The table below shows how many gallons of Reward Landscape and Aquatic Herbicide to apply per surface acre based on water depth.

| | **Gallons of Reward Landscape and Aquatic Herbicide per Surface Acre Average Water Depth** | | | |
|---|---|---|---|---|
| | **1 Foot** | **2 Feet** | **3 Feet** | **4 Feet** |
| 1 gallon/acre rate | 0.25 gal. | 0.50 gal. | 0.75 gal. | 1.0 gal. |
| 2 gallon/acre rate | 0.50 gal. | 1.0 gal. | 1.5 gals. | 2.0 gals. |

**Note:** For water depths of 2 feet or less including shorelines, do not exceed 1 gallon per surface acre.

**Subsurface Applications:** Where the submersed weed growth, especially Hydrilla, has reached the water surface, apply either in a water carrier or an invert emulsion through boom trailing hoses carrying nozzle tips to apply the dilute spray below the water surface to insure adequate coverage.

**Bottom Placement:** Where submersed weeds such as Hydrilla, Bladderwort, or Coontail have reached the water surface and/or where the water is slowly moving through the weed growth, the use of an invert emulsion carrier injecting diluted Reward Landscape and Aquatic Herbicide near the bottom with weighted hoses may improve control. The addition of a copper based algaecide may improve control. If algae are present along with the submersed weeds, a pretreatment with a copper based algaecide may improve overall control.

**Surface Application for Submerged Aquatic Weeds:** Apply the recommended rate of Reward Landscape and Aquatic Herbicide as a spray in sufficient carrier to fully cover the target area. Applications should be made to ensure complete coverage of the weed areas. In mixed weed populations, use the high rate of application as indicated by weeds present. For dense submersed weeds or water over 2 feet deep, a surface spray is not recommended (Reward Landscape and Aquatic Herbicide should be applied subsurface in these situations.)

**If posting is required by your state or tribe – consult the agency responsible for pesticide regulations for specific details.**

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For non-emergency (e.g., current product information), call
Syngenta Crop Protection at 1-800-334-9481.

Syngenta Crop Protection, Inc.
Greensboro, North Carolina 27409
www.syngenta-us.com

**SCP 1091A-L2C 0605**

REWARD®

# Landscape and Aquatic Herbicide

**TO PREVENT ACCIDENTAL POISONING, NEVER PUT INTO FOOD, DRINK, OR OTHER CONTAINERS, AND USE STRICTLY IN ACCORDANCE WITH ENTIRE LABEL.**

**DO NOT USE THIS PRODUCT FOR REFORMULATION.**

| | |
|---|---|
| Active Ingredient: Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2′,1′-c) pyrazinediium dibromide] | 37.3% |
| Other Ingredients: | 62.7% |
| Total: | 100.0% |

Contains 2 lbs. diquat cation per gal. (3.73 lbs. diquat dibromide per gal.)

See additional precautionary statements on label.

**AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

EPA Reg. No. 100-1091
EPA Est. 100-TX-001

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Product of United Kingdom
Formulated in the USA

Syngenta Crop Protection, Inc.
Greensboro, North Carolina 27409
www.syngenta-us.com

**SCP 1091A-L2C 0605**

## 2.5 gallons
**Net Contents**

## KEEP OUT OF REACH OF CHILDREN.

## WARNING/ AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

### FIRST AID

**If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

**NOTE TO PHYSICIANS:** To be effective, treatment for diquat poisoning must begin **IMMEDIATELY**. Treatment consists of binding diquat in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination, and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

**HOT LINE NUMBER:** For 24-Hour Medical Emergency Assistance (Human or Animal) or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident), Call **1-800-888-8372.**

## Precautionary Statements

**Hazards to Humans and Domestic Animals**

**WARNING/AVISO**

May be fatal if absorbed through skin. Harmful if swallowed or inhaled. Causes substantial, but temporary, eye injury. Causes skin irritation. Contact with irritated skin, or a cut, or repeated contact with intact skin may result in poisoning. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mist. Do not feed forage from treated crops to livestock. Keep livestock and pets out of treated fields and crop areas.

### Environmental Hazards

This pesticide is toxic to aquatic invertebrates. **For Terrestrial Uses,** do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water. **For Aquatic Uses** do not apply directly to water except as specified on this label.

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

### Pesticide Storage

Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not contaminate feed, foodstuffs, or drinking water. Do not store or transport near feed or food. Store at temperatures above 32°F. For help with any spill, leak, fire, or exposure involving this material, call **1-800-888-8372**.

### Pesticide Disposal

Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

### Container Disposal

Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

### For Bulk And Mini-Bulk Containers

When the container is empty, replace the cap and seal all openings that have been opened during use and return the container to the point of purchase, or to a designated location named at the time of purchase of this product. This container must be refilled with this pesticide product. **DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE.** Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting. Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, contact Syngenta Crop Protection at 1-800-888-8372. If not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling. Disposal of this container must be in compliance with state and local regulations.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

**CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER!**

syngenta

PULL HERE TO OPEN ►

# Reward®

## Landscape and aquatic herbicide

syngenta®

# Herbicide

**TO PREVENT ACCIDENTAL POISONING, NEVER PUT INTO FOOD, DRINK, OR OTHER CONTAINERS, AND USE STRICTLY IN ACCORDANCE WITH ENTIRE LABEL.**

**DO NOT USE THIS PRODUCT FOR REFORMULATION.**

*Active Ingredient:*
Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2',1'-c) pyrazinediium dibromide] . . . . . 37.3%

*Other Ingredients:* 62.7%

*Total:* 100.0%

Contains 2 lbs. diquat cation per gal. (3.73 lbs. diquat dibromide per gal.)

**KEEP OUT OF REACH OF CHILDREN.**

# CAUTION

See additional precautionary statements on label.

**EPA Reg. No. 100-1091 EPA Est. 100-LA-001**

**Product of United Kingdom**
**Formulated in the USA**

**SCP 1091A-L2G 1009**
**4034800**

**2.5 gallons**
**Net Contents**

™

| FIRST AID | |
|---|---|
| **If inhaled** | • Move person to fresh air.<br>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.<br>• Call a poison control center or doctor for further treatment advice. |
| **If swallowed** | • Call a poison control center or doctor immediately for treatment advice.<br>• Have person sip a glass of water if able to swallow.<br>• Do not induce vomiting unless told to do so by the poison control center or doctor.<br>• Do not give anything by mouth to an unconscious person. |
| **If in eyes** | • Hold eye open and rinse slowly and gently with water for 15-20 minutes.<br>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.<br>• Call a poison control center or doctor for treatment advice. |
| **If on skin or clothing** | • Take off contaminated clothing.<br>• Rinse skin immediately with plenty of water for 15-20 minutes.<br>• Call a poison control center or doctor for treatment advice. |
| **NOTE TO PHYSICIANS**<br>To be effective, treatment for diquat poisoning must begin **IMMEDIATELY**. Treatment consists of binding diquat in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination, and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis. | |
| Have the product container or label with you when calling a poison control center or doctor, or going for treatment. | |
| **HOTLINE NUMBER**<br>For 24-Hour Medical Emergency Assistance (Human or Animal) or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident), Call<br>**1-800-888-8372** | |

## PRECAUTIONARY STATEMENTS

**Hazards to Humans and Domestic Animals**

**CAUTION**

Harmful if inhaled. Harmful if swallowed. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with eyes, skin, or clothing.

*continued…*

## PRECAUTIONARY STATEMENTS *(continued)*

### Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are: barrier laminate, butyl rubber ≥14 mils, nitrile rubber ≥14 mils. If you want more options, follow the instructions for Category A on an EPA Chemical Resistance Category Selection Chart.

**Mixers, Loaders, Applicators and other handlers must wear:**

- Coveralls over short-sleeved shirt and short pants or coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing, or loading
- Face shield when mixing or loading

**Exception:** After this product has been diluted to 0.50% Reward or less in water (i.e., the labeled rate for some spot applications), applicators for AQUATIC SURFACE APPLICATIONS must, at a minimum, wear (Note - Mixers and Loaders for this application method must still wear the personal protective equipment (PPE) as described in the above section):

- Long-sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves
- Protective eyewear

**Exception:** At a minimum, applicators for AQUATIC SUBSURFACE APPLICATIONS must wear (Note - Mixers and Loaders for this application method must still wear the personal protective equipment (PPE) as described in the above section):

- Short-sleeved shirt and short pants
- Waterproof gloves
- Chemical-resistant footwear plus socks

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### Engineering Control Statements

Mixers and loaders supporting aerial applications are required to use closed systems that provide dermal protection. The closed system must be used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4)]. When using the closed system, mixers and loaders' PPE requirements may be reduced or modified as specified in the WPS.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

### User Safety Recommendations

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Prolonged contact of the product with the skin may produce burns.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### Environmental Hazards

This pesticide is toxic to aquatic invertebrates. **For Terrestrial Uses**, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water. **For Aquatic Uses** do not apply directly to water except as specified on this label.

## CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of SYNGENTA CROP PROTECTION, LLC or Seller. To the extent permitted by applicable law, Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

SYNGENTA warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. To the extent permitted by applicable law: (1) this warranty does not extend to the use of the product contrary to label instructions or under conditions not reasonably foreseeable to or beyond the control of Seller or SYNGENTA, and, (2) Buyer and User assume the risk of any such use. To the extent permitted by applicable law, SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS WARRANTED BY THIS LABEL.

To the extent permitted by applicable law, in no event shall SYNGENTA be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF SYNGENTA AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF SYNGENTA OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

SYNGENTA and Seller offer this product, and Buyer and User accept it, subject to the foregoing Conditions of Sale and Limitation of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of SYNGENTA.

## DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

**READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.**

**Do not apply this product through any type of irrigation system.**

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.**

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls over short-sleeved shirt and short pants, or coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure

**NON-AGRICULTURAL USE REQUIREMENTS**

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

**Keep all unprotected persons out of operating areas or vicinity where there may be drift.**

**For terrestrial uses,** do not enter or allow entry of maintenance workers into treated areas, or allow contact with treated vegetation wet with spray, dew, or rain, without appropriate protective clothing until spray has dried.

**For aquatic uses,** do not enter treated areas while treatments are in progress.

## SPECIFIC USE DIRECTIONS

Reward Landscape and Aquatic Herbicide is a nonvolatile herbicidal chemical for use as a general herbicide to control weeds in commercial greenhouses and nurseries; ornamental seed crops (flowers, bulbs, etc. – except in the state of California); landscape, industrial, recreational, commercial, residential, and public areas; turf renovation (all turf areas except commercial sod farms); dormant established turfgrass (bermudagrass, zoysiagrass – nonfood or feed crop); and aquatic areas. Absorption and herbicidal action is usually quite rapid with effects visible in a few days. Reward Landscape and Aquatic Herbicide controls weeds by interfering with photosynthesis within green plant tissue. Weed plants should be succulent and actively growing for best results. Rinse all spray equipment thoroughly with water after use. Avoid spray drift to crops, ornamentals, and other desirable plants during application, as injury may result. Application to muddy water may result in reduced control. Minimize creating muddy water during application. Use of dirty or muddy water for Reward Landscape and Aquatic Herbicide dilution may result in reduced herbicidal activity. Avoid applying under conditions of high wind, water flow, or wave action.

### SPRAY DRIFT MANAGEMENT

Avoiding spray drift at the application site is the responsibility of the applicator and the grower. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses, or to applications using dry formulations.

- The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees.

Where states have more stringent regulations, they should be observed.

## Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (See **Wind, Temperature and Humidity,** and **Temperature Inversions**).

## Controlling Droplet Size

- **Volume** – Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** – Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** – Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** – Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** – Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

## Boom Length

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

## Application Height

Applications should not be made at a height greater than 10 ft. above the top of the target plants, unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

## Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

## Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

### Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

### Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

### Sensitive Areas

The pesticide should only be applied when the wind is blowing away from adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, nontarget crops).

## COMMERCIAL GREENHOUSES AND NURSERIES

For general weed control in commercial greenhouses (beneath benches), field grown and container stock, and other similar areas, Reward Landscape and Aquatic Herbicide may be applied preplant or postplant preemergence in field grown ornamental nursery plantings or postemergence as a directed spray. Reward Landscape and Aquatic Herbicide may also be applied preemergence in ornamental seed crops (except in the state of California). Avoid contact with desirable foliage as injury may occur. Do not use on food or feed crops.

**Spot spray:** 1-2 qts. Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of water, or 0.75 oz. (22 mls.) Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water.

**Broadcast:** 1-2 pts. Reward Landscape and Aquatic Herbicide in a minimum of 15 gals. of water per acre. Add the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of spray mixture. Use an adequate spray volume to insure good coverage.

## ORNAMENTAL SEED CROPS (FLOWERS, BULBS, ETC.) EXCEPT IN THE STATE OF CALIFORNIA

For preharvest desiccation of ornamental seed crops. NOT FOR FOOD OR FIBER CROPS.

**Broadcast (Air or Ground):** 1.5-2 pts. Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per acre in sufficient water (minimum of 5 gals. by air; 15 gals. by ground) for desiccation and weed burndown. Repeat as needed at no less than 5-day intervals up to three applications. Do not use seed, screenings, or waste as feed or for consumption.

## DIRECTIONS FOR LANDSCAPE, INDUSTRIAL, RECREATIONAL, COMMERCIAL, RESIDENTIAL, AND PUBLIC AREAS

Reward Landscape and Aquatic Herbicide provides fast control of broadleaf and grassy weeds in industrial, recreational, golf course, commercial, residential, and public areas.

Reward Landscape and Aquatic Herbicide is a nonselective herbicide that rapidly kills undesirable above ground weed growth in 24-36 hours. Avoid application of Reward Landscape and Aquatic Herbicide to desirable plants.

Reward Landscape and Aquatic Herbicide is a contact/desiccant herbicide; it is essential to obtain complete coverage of the target weeds to get good control. Improper application technique and/or application to stressed weeds may result in unacceptable weed control. For best results, apply to actively growing, young weeds.

Difficult weeds (such as perennial or deeply-rooted weeds) can often be controlled by tank mixing Reward Landscape and Aquatic Herbicide with other systemic-type herbicides. Refer to other product labels for specific application directions.

For residual weed control, tank mix Reward Landscape and Aquatic Herbicide with a preemergent herbicide labeled for the intended use site. When mixing Reward Landscape and Aquatic Herbicide with another herbicide, it is recommended to mix just a small amount first to determine if the mixture is physically compatible before proceeding with larger volumes.

Syngenta has not tested all possible tank mixtures with other herbicides for compatibility, efficacy or other adverse effects. Before mixing with other herbicides Syngenta recommends you first consult your state experimental station, state university or extension agent.

**Grounds maintenance weed control:** Reward Landscape and Aquatic Herbicide can be used as a spot or broadcast spray to control weeds in public, commercial and residential landscapes, including landscape beds, lawns, golf courses and roadsides. Reward Landscape and Aquatic Herbicide can also be used for weed control around the edges and nonflooded portions of ponds, lakes and ditches.

**Trim and Edge weed control:** Reward Landscape and Aquatic Herbicide can be used to eliminate undesired grass and broadleaf plant growth in a narrow band along driveways, walkways, patios, cart paths, fence lines, and around trees, ornamental gardens, buildings, other structures, and beneath noncommercial greenhouse benches. Vegetation control with Reward Landscape and Aquatic Herbicide is limited to the spray application width. Do not exceed the labeled rate of Reward Landscape and Aquatic Herbicide as excessive rates may result in staining of concrete-based materials.

Reward Landscape and Aquatic Herbicide, since it does not translocate systemically, can be used as an edging or pruning tool when precisely applied to select areas of grass or to undesirable growth on desirable ornamental bedding plants, ground covers, etc.

**Industrial weed control:** Reward Landscape and Aquatic Herbicide can be used as a spot or broadcast spray either alone or in combination with other herbicides as a fast burndown or control weeds in rights-of-ways, railroad beds/yards, highways, roads, dividers and medians, parking lots, pipelines, pumping stations, public utility lines, transformer stations and substations, electric utilities, storage yards, and other non-crop areas.

**Spot spray:** Apply either 1-2 qts. of Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 100 gals. water, or 0.75 oz. (22 mls.) Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water.

**Broadcast:** 1-2 pts. Reward Landscape and Aquatic Herbicide per acre in sufficient water to insure good spray coverage. Add the labeled rate of 75% or greater nonionic surfactant per 100 gals. spray mixture. Greater water volumes are necessary if the target plants are tall and/or dense. It is recommended that 60 gals. or greater water volume be used to obtain good coverage of dense weeds.

## TURF RENOVATION (ALL TURF AREAS EXCEPT COMMERCIAL SOD FARMS)

To desiccate golf course turf and other turf areas prior to renovation, apply 1-2 pts. of Reward Landscape and Aquatic Herbicide per acre plus the labeled rate of a 75% or greater nonionic surfactant in 20-100 gals. of water (4 teaspoons of Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water) using ground spray equipment. Apply for full coverage and thorough contact with the turfgrass. Apply only when the turf is dry, free from dew and incidental moisture. For enhanced turf desiccation, especially in the case of thick turfgrass, water volumes should approach 100 gals. of water per acre.

For **suppression** of regrowth and quick desiccation of treated turfgrass, Reward Landscape and Aquatic Herbicide may be mixed with other systemic nonselective or systemic postemergence grassy weed herbicides. Refer to other product labels for specific application directions and restrictions.

Avoid spray contact with, or spray drift to, foliage of ornamental plants or food crops.

Do not graze livestock on treated turf or feed treated thatch to livestock.

## DORMANT ESTABLISHED TURFGRASS (BERMUDAGRASS, ZOYSIAGRASS), NONFOOD OR FEED CROP

For control of emerged annual broadleaf and grass weeds, including Little Barley*, Annual Bluegrass, Bromes including Rescuegrass, Sixweeks fescue, Henbit, Buttercup, and Carolina Geranium in established dormant bermudagrass lawns, parks, golf courses, etc.

Apply 1-2 pts. Reward Landscape and Aquatic Herbicide per acre in 20-100 gals. of spray mix by ground as a broadcast application. Add the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of spray mixture.

Bermudagrass must be dormant at application. Application to actively growing bermudagrass may cause delay or permanent injury. Users in the extreme Southern areas should be attentive to the extent of dormancy at the time of application.

*For control of Little Barley, apply Reward Landscape and Aquatic Herbicide prior to the mid-boot stage.

## AQUATIC USE DIRECTIONS

### New York – Not for Sale or Use in New York State without Supplemental Special Local Needs Labeling.

Necessary approval and/or permits must be obtained prior to application if required. Consult the responsible State Agencies (i.e., Fish and Game Agencies, State Water Conservation authorities, or Department of Natural Resources).

Treatment of dense weed areas may result in oxygen loss from decomposition of dead weeds. This loss of oxygen may cause fish suffocation. Therefore, treat only 1/3 to 1/2 of the water body area at one time and wait 14 days between treatments.

For best results on submersed weeds, Reward Landscape and Aquatic Herbicide should be applied to actively growing (photosynthesizing) weeds when water temperatures have reached or exceeded approximately 50°F, typically during the Spring or early Summer.

For application only to **still water** (i.e. ponds, lakes, and drainage ditches) where there is minimal or no outflow to public waters.

and/or

For applications to **public waters** in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, streams, rivers, and other slow-moving or quiescent bodies of water for control of aquatic weeds. For use by:

- Corps of Engineers; or
- Federal or State Public Agencies (i.e., Water Management District personnel, municipal officials); or
- Applicators and/or Licensees (certified for aquatic pest control) that are authorized by the State or Local government.

Treated water may be used according to the following table or until such time as an approved assay (example: PAM II Spectromatic Method) shows that the water does not contain more than the designated maximum contaminant level goal (MCLG) of 0.02 mg/l. (ppm) of diquat dibromide (calculated as the cation).

### Water Use Restrictions Following Applications With Reward Landscape And Aquatic Herbicide (Days)

| Application Rate | Drinking | Fishing and Swimming | Livestock/ Domestic Animals Consumption | Spray Tank Applications** and Irrigation to Turf and Landscape Ornamentals | Spray Tank Applications** and Irrigation to Food Crops and Production Ornamentals |
|---|---|---|---|---|---|
| 2 gals./surface acre | 3 days | 0 | 1 day | 3 days | 5 days |
| 1 gal./surface acre | 2 days | 0 | 1 day | 2 days | 5 days |
| 0.75 gal./surface acre | 2 days | 0 | 1 day | 2 days | 5 days |
| 0.50 gal./surface acre | 1 day | 0 | 1 day | 1 day | 5 days |
| **Spot Spray*** (<0.5 gal./surface acre) | 1 day | 0 | 1 day | 1 day | 5 days |

*Add a nonionic surfactant (with at least 75% of the constituents active as a spray adjuvant) at the rate recommended by the manufacturer.

**For preparing agricultural sprays for food crops, turf or ornamentals (to prevent phytotoxicity), do not use water treated with Reward Landscape and Aquatic Herbicide before the specified time period.

When the contents of more than one spray tank is necessary to complete a single aquatic application, no water holding restrictions apply between the consecutive spray tanks.

No applications are to be made in areas where commercial processing of fish, resulting in the production of fish protein concentrate or fish meal, is practiced. Before application, coordination and approval of local and/or State authorities must be obtained.

### Floating and Marginal Weeds Including:

Water lettuce, *Pistia stratiotes*
Water hyacinth, *Eichhornia crassipes*
Duckweed, *Lemna* spp.
Salvinia spp. (including *S. molesta*)
Pennywort (*Hydrocotyle* spp.)
Frog's Bit[1], *Limnobium spongia*
Cattails, *Typha* spp.

[1]Not for use in California

Reward Landscape and Aquatic Herbicide may be applied by backpack, airboat, spray handgun, helicopter, airplane, or similar application equipment that results in thorough spray coverage.

**Spot Treatment:** Apply Reward Landscape and Aquatic Herbicide at 2 quarts per 100 gallons spray carrier (0.5% solution) with an approved aquatic wetting agent at 0.25-1.0% v/v (1 quart to 1 gallon per 100 gallons water). For cattail control, Reward Landscape and Aquatic Herbicide should be applied prior to flowering at the maximum application rate (8 quarts of Reward Landscape and Aquatic Herbicide/100 gallons spray carrier) plus the wetting agent. Repeat treatments may be necessary for complete control.

Spray to completely wet target weeds but not to runoff. Densely packed weeds or mats may require additional applications due to incomplete spray coverage. Re-treat as needed. For best results, re-treat weed escapes within 2 weeks of the initial treatment.

**Broadcast Treatment:** Apply Reward Landscape and Aquatic Herbicide at the rate of 0.5-2.0 gallons per surface acre in sufficient carrier along with 16-32 oz./A of an approved wetting agent. Re-treat as necessary for densely populated weed areas. Good coverage is necessary for control of the target weeds.

For duckweed control, apply Reward Landscape and Aquatic Herbicide at 1-2 gallons/A.

**Submersed Weeds Including:**

Bladderwort, *Utricularia* spp.
Hydrilla, *Hydrilla verticillata*
Watermilfoils (including Eurasian), *Myriophyllum* spp.
Pondweeds[1], *Potamogeton* spp.
Coontail, *Ceratophyllum demersum*
Elodea, *Elodea* spp.
Brazilian Elodea, *Egeria densa*
Naiad, *Najas* spp.
Algae[2], *Spirogyra* spp. and *Pithophora* spp.

[1] Reward Landscape and Aquatic Herbicide controls *Potamogetan* species except Richardson's pondweed, *P. richardsonii*.

[2] Suppression only. For control of *Spirogyra* and/or *Pithophora*, use Reward Landscape and Aquatic Herbicide in a tank mix with an approved algaecide.

For severe weed or algae infestations, the use of an approved algaecide either as a pretreatment to the Reward Landscape and Aquatic Herbicide application or in a tank mix, may result in enhanced weed control.

To control submersed weeds, apply Reward Landscape and Aquatic Herbicide in water at 0.5-2.0 gallons per surface acre (per 4 foot water depth). For severe weed infestations, use the 2.0 gallon per surface acre rate. For best results, re-treat as necessary on 14-21 day intervals. The table below shows how many gallons of Reward Landscape and Aquatic Herbicide to apply per surface acre based on water depth.

| | **Gallons of Reward Landscape and Aquatic Herbicide per Surface Acre Average Water Depth** | | | |
|---|---|---|---|---|
| | **1 Foot** | **2 Feet** | **3 Feet** | **4 Feet** |
| 1 gallon/acre rate | 0.25 gal. | 0.50 gal. | 0.75 gal. | 1.0 gal. |
| 2 gallon/acre rate | 0.50 gal. | 1.0 gal. | 1.5 gals. | 2.0 gals. |

**Note:** For water depths of 2 feet or less including shorelines, do not exceed 1 gallon per surface acre.

**Subsurface Applications:** Where the submersed weed growth, especially Hydrilla, has reached the water surface, apply either in a water carrier or an invert emulsion through boom trailing hoses carrying nozzle tips to apply the dilute spray below the water surface to insure adequate coverage.

**Bottom Placement:** Where submersed weeds such as Hydrilla, Bladderwort, or Coontail have reached the water surface and/or where the water is slowly moving through the weed growth, the use of an invert emulsion carrier injecting diluted Reward Landscape and Aquatic Herbicide near the bottom with weighted hoses may improve control. The addition of a copper based algaecide may improve control. If algae are present along with the submersed weeds, a pretreatment with a copper based algaecide may improve overall control.

**Surface Application for Submerged Aquatic Weeds:** Apply the recommended rate of Reward Landscape and Aquatic Herbicide as a spray in sufficient carrier to fully cover the target area. Applications should be made to ensure complete coverage of the weed areas. In mixed weed populations, use the high rate of application as indicated by weeds present. For dense submersed weeds or water over 2 feet deep, a surface spray is not recommended (Reward Landscape and Aquatic Herbicide should be applied subsurface in these situations.)

**If posting is required by your state or tribe – consult the agency responsible for pesticide regulations for specific details.**

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

### Pesticide Storage

Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not contaminate feed, foodstuffs, or drinking water. Do not store or transport near feed or food. Store at temperatures above 32°F. For help with any spill, leak, fire, or exposure involving this material, call **1-800-888-8372**.

### Pesticide Disposal

Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

### Container Handling [less than 5 gallons]

Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use and disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

## Container Handling [Bulk/Mini-Bulk]

Refillable container. Refill this container with Reward Landscape and Aquatic Herbicide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the person refilling. To clean container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities. If the container is damaged, leaking or obsolete, contact Syngenta Crop Protection at 1-800-888-8372.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

**CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER!**

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Reward®, the ALLIANCE FRAME
the SYNGENTA Logo and the PURPOSE ICON
are Trademarks of a Syngenta Group Company.

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For non-emergency (e.g., current product information), call
Syngenta Crop Protection at 1-800-334-9481.

Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, North Carolina 27419-8300

**SCP 1091A-L2G 1009**
**4034800**

Reward®
Landscape and aquatic herbicide

# Landscape and Aquatic Herbicide

**TO PREVENT ACCIDENTAL POISONING, NEVER PUT INTO FOOD, DRINK, OR OTHER CONTAINERS, AND USE STRICTLY IN ACCORDANCE WITH ENTIRE LABEL.**

**DO NOT USE THIS PRODUCT FOR REFORMULATION.**

Active Ingredient:
Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2′,1′-c) pyrazinediium dibromide] . . . . . 37.3%

| | |
|---|---|
| Other Ingredients: | 62.7% |
| Total: | 100.0% |

Contains 2 lbs. diquat cation per gal. (3.73 lbs. diquat dibromide per gal.)

See additional precautionary statements in booklet.

**AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

EPA Reg. No. 100-1091
EPA Est. 100-LA-001

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Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, North Carolina 24719-8300

**SCP 1091A-L2G 1009**
**4034800**

(01) 0 07 02941 73710 5

## KEEP OUT OF REACH OF CHILDREN.

# CAUTION

### FIRST AID

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

**If swallowed:** Call poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**NOTE TO PHYSICIANS:** To be effective, treatment for diquat poisoning must begin **IMMEDIATELY**. Treatment consists of binding diquat in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination, and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

**HOT LINE NUMBER:** For 24-Hour Medical Emergency Assistance (Human or Animal) or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident), Call **1-800-888-8372**.

## PRECAUTIONARY STATEMENTS

**Hazards to Humans and Domestic Animals**

**CAUTION**

Harmful if inhaled. Harmful if swallowed. Causes moderate eye irritation. Avoid breathing spray mist. Avoid contact with eyes, skin, or clothing.

**Environmental Hazards:** This pesticide is toxic to aquatic invertebrates. For Terrestrial Uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water. For Aquatic Uses do not apply directly to water except as specified on this label.

## STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

**Pesticide Storage:** Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not contaminate feed, foodstuffs, or drinking water. Do not store or transport near feed or food. Store at temperatures above 32°F. For help with any spill, leak, fire, or exposure involving this material, call 1-800-888-8372.

**Pesticide Disposal:** Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Container Handling [less than 5 gallons]:** Non-refillable container. Do not reuse or refill this container. Offer for recycling if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use and disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

**CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER!**

# 2.5 gallons

**Net Contents**

syngenta®

# MATERIAL SAFETY DATA SHEET

**Syngenta Crop Protection, LLC**
**Post Office Box 18300**
**Greensboro, NC 27419**

**In Case of Emergency, Call**
**1-800-888-8372**

## 1. PRODUCT IDENTIFICATION

Product Name: **REWARD LANDSCAPE AND AQUATIC HERBICIDE** Product No.: A12872A

EPA Signal Word: Caution

Active Ingredient(%): Diquat Dibromide (37.3%) CAS No.: 85-00-7

Chemical Name: [6,7-dihydrodipyrido(1,2-a:2',1'-c)pyrazinediium dibromide]

Chemical Class: Bipyridilium (dipyridilium) contact herbicide

EPA Registration Number(s): 100-1091 **Section(s) Revised: 14**

## 2. HAZARDS IDENTIFICATION

Health and Environmental

Toxic if inhaled. Harmful if swallowed. Causes mild eye and skin irritation.

Hazardous Decomposition Products

Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10.

Physical Properties

Appearance: Dark brown liquid

Odor: Odorless

Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Material | OSHA PEL | ACGIH TLV | Other | NTP/IARC/OSHA Carcinogen |
|---|---|---|---|---|
| Diquat Dibromide (37.3%) | Not Established | 0.5 mg/m³ TWA | 0.5 mg/m³ TWA (0.5 total; 0.08 respirable) *** | No |

*** Syngenta Occupational Exposure Limit (OEL)

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.
Syngenta Hazard Category: C, S

## 4. FIRST AID MEASURES

Have the product container, label or Material Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison contol center or doctor, or going for treatment.

Ingestion: If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Eye Contact: If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

Skin Contact: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.

Inhalation: If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

Notes to Physician

To be effective, treatment for ingestion of the product must begin IMMEDIATELY. Treatment consists of binding the active ingredient, diquat, in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.

Medical Condition Likely to be Aggravated by Exposure

None known.

## 5. FIRE FIGHTING MEASURES

Fire and Explosion

| | | |
|---|---|---|
| Flash Point (Test Method): | Not Applicable | |
| Flammable Limits (% in Air): | Lower: Not Applicable | Upper: Not Applicable |
| Autoignition Temperature: | Not Applicable | |
| Flammability: | Not Applicable | |

Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

In Case of Fire

Use dry chemical, foam or CO2 extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

## 6. ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

## 7. HANDLING AND STORAGE

This product reacts with aluminum to produce flammable hydrogen gas. Do not mix or store in containers or systems made of aluminum or having aluminum fittings.

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THIS PRODUCT.**

**FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.**

| | |
|---|---|
| Ingestion: | Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling. |
| Eye Contact: | Where eye contact is likely, use chemical splash goggles. |
| Skin Contact: | Where contact is likely, wear chemical-resistant gloves (such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyvinyl chloride [PVC] or Viton), coveralls, socks and chemical-resistant footwear. |
| Inhalation: | A respirator is not normally required when handling this substance. Use effective engineering controls to comply with occupational exposure limits.<br><br>In case of emergency spills, use a NIOSH approved respirator with any N, R, P or HE filter. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Appearance: | Dark brown liquid |
| Odor: | Odorless |
| Melting Point: | Not Applicable |
| Boiling Point: | Not Available |
| Specific Gravity/Density: | 1.202 g/ml @ 68°F (20°C) |
| pH: | 4 - 6 |

Solubility in H2O

| | |
|---|---|
| Diquat Dibromide: | 718,000 mg/l @ 68°F (20°C) and pH 7.2 |

Vapor Pressure

| | |
|---|---|
| Diquat Dibromide: | < 10(-8) mmHg @ 77°F (25°C) |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| Stability: | Stable under normal use and storage conditions. |
| Hazardous Polymerization: | Will not occur. |
| Conditions to Avoid: | Concentrate should not be stored in aluminum containers. Spray solutions should not be mixed, stored or applied in containers other than plastic, plastic-lined steel, stainless steel or fiberglass. |
| Materials to Avoid: | Strong alkalis and anionic wetting agents (e.g., alkyl and alkylaryl sulfonates). Corrosive to aluminum. |
| Hazardous Decomposition Products: | Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10. |

## 11. TOXICOLOGICAL INFORMATION

Acute Toxicity/Irritation Studies (Finished Product)

| | | |
|---|---|---|
| Ingestion: | | |
| | Oral (LD50 Female Rat) : | 886 mg/kg body weight |
| Dermal: | | |
| | Dermal (LD50 Rabbit) : | > 5050 mg/kg body weight |
| Inhalation: | | |
| | Inhalation (LC50 Rat) : | 0.62 mg/l air - 4 hours |
| Eye Contact: | Mildly Irritating (Rabbit) | |
| Skin Contact: | Slightly Irritating (Rabbit) | |
| Skin Sensitization: | Not a Sensitizer (Guinea Pig) | |

Reproductive/Developmental Effects

Diquat Dibromide: Mutagenicity: No evidence in in vivo assays.
Development Toxicity: In rabbit studies a small percentage of fetuses had minor defects at 3 and 10 mg ion/kg/d.

Chronic/Subchronic Toxicity Studies

Diquat Dibromide: Kidney weight decreases and cataracts seen in dogs at 12.5 mg ion/kg/d.
No evidence for neurotoxic effects in rats dosed up to 400 ppm ion in the diet for 13 weeks.

Carcinogenicity

Diquat Dibromide: No evidence of carcinogenicity in rat and mouse studies.

Other Toxicity Information

None

Toxicity of Other Components

Not Applicable

Target Organs

Active Ingredients

Diquat Dibromide: Eye, kidney

Inert Ingredients

Not Applicable

## 12. ECOLOGICAL INFORMATION

Ecotoxicity Effects

Diquat Dibromide:

Fish (Rainbow Trout) 96-hour LC50 14.83 ppm

Invertebrate (Water Flea) Daphnia Magna 48-hour EC50 0.77 ppm

Green Algae 4-day EC50 9.4 ppb

Bird (Mallard Duck) 14-day LD50 60.6 mg/kg

Environmental Fate

Diquat Dibromide:

The information presented here is for the active ingredient, diquat dibromide.
Stable in soil and water. Immobile in soil. Sinks in water (after 24 h).

## 13. DISPOSAL CONSIDERATIONS

Disposal

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

## 14. TRANSPORT INFORMATION

DOT Classification

Ground Transport - NAFTA

Proper Shipping Name: Corrosive Liquid, N.O.S. (Diquat Dibromide)
Hazard Class: Class 8
Identification Number: UN 1760
Packing Group: PG III

Comments

Water Transport - International
Proper Shipping Name: Corrosive Liquid, N.O.S. (Diquat Dibromide), Marine Pollutant
Hazard Class: Class 8
Identification Number: UN 1760
Packing Group: PG III

Air Transport
Proper Shipping Name: Corrosive Liquid, N.O.S. (Diquat Dibromide)
Hazard Class: Class 8
Identification Number: UN 1760
Packing Group: PG III

## 15. REGULATORY INFORMATION

EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard

Section 313 Toxic Chemicals: Not Applicable

California Proposition 65

None

CERCLA/SARA 302 Reportable Quantity (RQ)

Report product spills >= 268 gal. (based on diquat [RQ = 1,000 lbs.] content in the formulation)

RCRA Hazardous Waste Classification (40 CFR 261)

Not Applicable

TSCA Status

Exempt from TSCA, subject to FIFRA

## 16. OTHER INFORMATION

| NFPA Hazard Ratings | | HMIS Hazard Ratings | |
|---|---|---|---|
| Health: | 2 | Health: | 2 |
| Flammability: | 1 | Flammability: | 1 |
| Instability: | 0 | Reactivity: | 0 |

| | |
|---|---|
| 0 | Minimal |
| 1 | Slight |
| 2 | Moderate |
| 3 | Serious |
| 4 | Extreme |

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 4/11/2002
Revision Date: 2/4/2011 Replaces: 7/14/2010

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

# Agri-dex Label and MSDS

CPDA Certified

# AGRI-DEX®

## A Crop Oil Concentrate

***PRINCIPAL FUNCTIONING AGENTS:**

| | |
|---|---|
| Heavy range paraffinic oil, Polyol fatty acid esters, and Polyethoxylated derivatives thereof | 99.0% |
| **CONSTITUENTS INEFFECTIVE AS SPRAY ADJUVANTS** | 1.0% |
| **TOTAL** | 100.0% |

Surfactant Content . . . . . 17.00%
Unsulfonated Oil Residue (UR) Value. . . . . 95.00% minimum

*All ingredients are accepted for use under CFR 40, 180.
**CONTAINS PETROLEUM DISTILLATES.**

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

**See Inside Panel for Additional Precautionary Statements**

SN 0410/0112

**CA Reg. No. 5905-50094-AA**

**Manufactured For**
**HELENA CHEMICAL COMPANY**
**225 SCHILLING BOULEVARD, SUITE 300 • COLLIERVILLE, TENNESSEE 38017**

**OPM #110156**

**PEEL BACK BOOK HERE AND RESEAL AFTER OPENING**

**NET CONTENTS:**

## PRECAUTIONARY STATEMENT

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

# CAUTION

**BEFORE USING THIS PRODUCT, READ ALL PRECAUTIONS, DIRECTIONS FOR USE, CONDITIONS OF SALE–LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES.**

Causes moderate eye irritation. Harmful if inhaled or absorbed through skin. Avoid contact with skin, eyes or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum or smoking tobacco. Remove and wash contaminated clothing before reuse.

**Personal Protective Equipment:** Wear chemical-resistant gloves, long-sleeved shirt and long pants, shoes plus socks when mixing or applying **AGRI-DEX®**.

| FIRST AID | |
|---|---|
| **IF IN EYES:** | • Hold eye open and rinse slowly and gently with water for 15–20 minutes.<br>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.<br>• Call a poison control center or doctor for treatment advice. |
| **IF SWALLOWED:** | • Call a poison control center or doctor immediately for treatment advice.<br>• Do not induce vomiting unless told to do so by a poison control center or doctor.<br>• Do not give **any** liquid to the person.<br>• Do not give anything by mouth to an unconscious person. |
| **IF INHALED:** | • Move person to fresh air.<br>• If not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.<br>• Call a poison control center or doctor for further treatment advice. |
| **IF ON SKIN OR CLOTHING:** | • Take off contaminated clothing.<br>• Rinse skin immediately with plenty of water for 15–20 minutes.<br>• Call a poison control center or doctor for treatment advice. |
| **NOTE TO PHYSICIAN:** Petroleum distillate may pose an aspiration pneumonia hazard. | |
| **HOT LINE NUMBER** | |
| Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information. | |

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

**STORAGE:** Store in original container only. Keep container tightly closed. Do not allow water to be introduced into the contents of this container. Do not store near heat or open flame. Do not store with oxidizing agents or ammonium nitrate.

**PESTICIDE DISPOSAL:** Wastes resulting from the use of this product may be dispersed of on site or at an approved waste disposal facility. Do not contaminate water sources by runoff from cleaning of equipment, disposal of cleaning equipment washwaters, or spray waste.

**CONTAINER DISPOSAL:** Do not reuse empty container. Triple rinse (or equivalent) during mixing and loading and add rinsate to spray tank. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your State and local ACRC recycler, visit the ACRC web page at www.acrecycle.org. Decontaminated containers may also be disposed of in a sanitary landfill. For help in chemical emergencies involving spill, leak, fire or exposure, call toll free 1-800-424-9300.

**REFILLABLE CONTAINER:** Refill this container with adjuvants only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from the container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. If the container is not being refilled, return the container to the point of purchase.

## GENERAL INFORMATION

**AGRI-DEX®** is a non-ionic blend of special surfactants and a highly refined spray oil and is designed for use with a broad range of pesticides where an oil concentrate adjuvant is recommended. Subject to the cautionary statements set forth in the Directions for Use, **AGRI-DEX®** may be used with other pesticides and/or fertilizer products. The addition of **AGRI-DEX®** to a spray tank improves pesticide application by modifying the wetting and deposition characteristics of the spray solution resulting in a more even and uniform spray deposit. **AGRI-DEX®** can positively affect pesticide spray application and pesticide efficacy. Optimum application and effects, however, can be influenced by the crop, pest, spray equipment, spray volume, pressure, droplet size, spray mixture and environmental factors. Consequently, it is recommended that careful observations of the spray deposit be made and adjuvant concentrations be adjusted accordingly.

## DIRECTIONS FOR USE

**FOR USE WITH PRODUCTS REGISTERED FOR: AGRICULTURAL, AQUATIC, FORESTRY, INDUSTRIAL, MUNICIPAL, NON-CROPLAND, ORNAMENTAL, RIGHTS-OF-WAY, TURF AND OTHER USES.**

The addition of an adjuvant to some pesticides or pesticide tank mix combinations may cause phytotoxicity to the foliage and/or fruit of susceptible crops. Prior to the addition of **AGRI-DEX®** to spray tank mixes or prior to the use of **AGRI-DEX®** with a pesticide or fertilizer where an oil concentrate adjuvant is not specifically recommended but not prohibited by the manufacturer, the user or application advisor must have experience with the combination or must have conducted a phytotoxicity trial.

**AGRI-DEX®** may be applied by Ground, CDA, Aerial or Aquatic spray equipment and any other type spray equipment recommended by pesticide labels. In most applications, use enough **AGRI-DEX®** to allow for uniform wetting and deposition of the spray onto plant surfaces without undue runoff.

**GROUND:** Use 1–4 pints per acre or 1.0% by v/v with a minimum of 0.50% by volume.

**AERIAL, LOW VOLUME, CDA:** Use 4–8 pints per 100 gallons water or 0.50–1.00% v/v concentration.

**AQUATIC:** Use 1–4 pints per acre.

**NOTE:** The above use recommendations are considered to be adequate for most uses. Do not exceed 2.5% v/v concentration. Some pesticides, however, may require higher or lower rates for optimum effect. Follow the pesticide label directions when this occurs.

**CAUTION:** Do not mix with oxidizing agents unless oxidizing agents are in solution.

## MIXING

Prior to any pesticide application all spray mixing and application equipment must be cleaned. Carefully observe all cleaning directions on the pesticide label.

Fill spray tank one-half full with water and begin agitation. Add pesticides and/or fertilizers as directed by labeling or in the following sequence:

1. Dry flowables or water dispersible granules
2. Wettable powders
3. Flowables
4. Solutions
5. Emulsifiable concentrates

and continue filling. Add **AGRI-DEX®** last and continue agitating.

## CONDITIONS OF SALE – LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

**Read the Conditions of Sale – Warranty and Limitations of Liability and Remedies before using this product. If the terms are not acceptable, return the product, unopened, and the full purchase price will be refunded.**

The directions on this label are believed to be reliable and should be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions or the failure to follow the label directions or good application practices, all of which are beyond the control of Helena Chemical Company (the "Company") or the seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. The Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the factors noted above which are beyond the control of the Company. The Company makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose, and no such warranty shall be implied by law.

The exclusive remedy against the Company for any cause of action relating to the handling or use of this product shall be limited to, at Helena Chemical Company's election, one of the following:

1. Refund of the purchase price paid by buyer or user for product bought, or
2. Replacement of the product used

To the extent allowed by law, the Company shall not be liable and any and all claims against the Company are waived for special, indirect, incidental, or consequential damages or expense of any nature, including, but not limited to, loss of profits or income. The Company and the seller offer this product and the buyer and user accept it, subject to the foregoing conditions of sale and limitation of warranty, liability and remedies.

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**AGRI-DEX®** is a registered trademark of Helena Holding Company.

# A Crop Oil Concentrate

***PRINCIPAL FUNCTIONING AGENTS:**

| | |
|---|---|
| Heavy range paraffinic oil, Polyol fatty acid esters, and Polyethoxylated derivatives thereof | 99.0% |
| **CONSTITUENTS INEFFECTIVE AS SPRAY ADJUVANTS** | 1.0% |
| **TOTAL** | 100.0% |

Surfactant Content . . . . . 17.00%
Unsulfonated Oil Residue (UR) Value. . . . . 95.00% minimum

*All ingredients are accepted for use under CFR 40, 180.
**CONTAINS PETROLEUM DISTILLATES.**

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

**See Inside Panel for Additional Precautionary Statements**

SN 0410/0112

**CA Reg. No. 5905-50094-AA**

**Manufactured For**

**HELENA CHEMICAL COMPANY**

**225 SCHILLING BOULEVARD, SUITE 300 • COLLIERVILLE, TENNESSEE 38017**

# Material Safety Data Sheet

Effective Date: 01-AUG-2012
Product: AGRI-DEX

## I. IDENTIFICATION

Chemical Name: NONIONIC OIL CONCENTRATE
Chemical Family: OIL SURFACTANTS
Formula: NOT APPLICABLE, FORMULATED MIXTURE.
Synonyms: NONE
CAS Number: 64741-88-4; 64741-89-5
EPA Number: NONE REQUIRED

## II. PHYSICAL DATA

Boiling Point: 625 TO 830 DEG F.
Freezing Point: <32 DEGREES F.
Spec Gravity: .879 GMS/CC
Vapor Pressure: .0001 MM HG
Vapor Density: 10+
Solubility: DISPERSIBLE
Volatiles: <1%
Evaporation: 1000X
Melting Point: >10 DEGREES F.
Appearance: CLEAR AMBER LIQUID, MINERAL OIL ODOR.

## III. INGREDIENTS

| Material | CAS Number | Percent | TLV | Hazard |
|---|---|---|---|---|
| PROPRIETARY BLEND OF HEAVY RANGE PARAFFIN BASE PETROLEUM OIL, POLYOL FATTY ACID ESTERS, AND POLYETHOXYLATED DERIVATIVES | | 100.00 | 5 MG/M3 | MILD SKIN & EYE IRRITANT |

## IV. FIRE AND EXPLOSION HAZARD

Flash Point: >200 DEGREES F.
Autoignition Temp: 670 DEG F.(ESTIMATE)
Flammable Limit: NOT DETERMINED
Extinguishing Media: WATER FOG, FOAM, DRY CHEMICAL AND CARBON DIOXIDE.
Special Fire Fight Proc: WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.
Fire and Expl Hazard: CAN BE MADE TO BURN (FLASH POINT GREATER THAN 200 DEGREES F).

Material Safety Data Sheet

Effective Date: 01-AUG-2012
Product: AGRI-DEX

## V. HEALTH HAZARD

Carcinogen Information: NONE CURRENTLY KNOWN.

### ACUTE EFFECTS OF OVER EXPOSURE

Swallowing: LOW TOXICITY, ORAL LD50 (RAT) >5,010 GM/KG. PULMONARY ASPIRATION HAZARD - IF SWALLOWED AND/OR VOMITING OCCURS, CAN ENTER LUNGS AND CAUSE DAMAGE.
Skin Absorption: LOW TOXICITY, DERMAL LD50 (RABBIT) >2,020 GM/KG.
Inhalation: NO HAZARD EXPECTED.
Skin contact: MODERATE IRRITATION, REMOVES NATURAL OILS AND FATS FROM SKIN WITH PROLONGED OR REPEATED CONTACT.
Eye Contact: CONTACT WITH EYES MAY CAUSE MILD IRRITATION.
Chronic Effects: EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE AND THROAT.
Other Hazard: NONE CURRENTLY KNOWN.

### EMERGENCY AND FIRST AID PROCEDURES

Swallowing: DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS. OBTAIN EMERGENCY MEDICAL ATTENTION. SMALL AMOUNTS WHICH ACCIDENTALLY ENTER MOUTH SHOULD BE RINSED OUT UNTIL TASTE OF IT IS GONE.
Skin: WASH CONTAMINATED AREA WITH SOAP AND WATER. IF IRRITATION DEVELOPS, CONSULT A PHYSICIAN.
Inhalation: MOVE PERSON TO FRESH AIR. CONSULT A PHYSICIAN IF IRRITATION DEVELOPS.
Eyes: FLUSH EYES WITH WATER FOR 15 MINUTES, HOLDING EYELIDS OPEN. IF IRRITATION DEVELOPS, CONSULT A PHYSICIAN.
Notes to Physician: IN THE EVENT OF AN ADVERSE RESPONSE, TREATMENT SHOULD BE DIRECTED TOWARD CONTROL OF THE SYMPTOMS. PULMONARY ASPIRATION HAZARD - IF SWALLOWED AND/OR VOMITING OCCURS, CAN ENTER LUNGS AND CAUSE DAMAGE.

## VI. REACTIVITY

Stability: Stable
Conditions to Avoid: NONE CURRENTLY KNOWN
Polymerization: Will Not Occur
Conditions to Avoid: NONE CURRENTLY KNOWN.

Material Safety Data Sheet

Effective Date: 01-AUG-2012
Product: AGRI-DEX

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Incompatibility material: ALKALIES AND STRONG OXIDIZERS.
Hazardous Combustion: MAY PRODUCE OXIDES OF CARBON AND ASPHYXIANTS UNDER FIRE CONDITIONS.

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## VII. SPILL OR LEAK PROCEDURES

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Spill or Leak Proc: CLEANUP SPILLS WITH AN OIL ABSORBENT MATERIAL, SUCH AS CLAY, SAND, OR SAWDUST. SPILL AREA WILL BE QUITE SLIPPERY. PLACE CONTAMINATED MATERIAL IN RECOVERY/SALVAGE DRUMS FOR PROPER DISPOSAL.
Waste Disposal Method: THIS MATERIAL MUST BE DISPOSED OF ACCORDING TO FEDERAL, STATE, OR LOCAL PROCEDURES UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT.

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## VIII. SPECIAL PROTECTION INFORMATION

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Respiration: USE ONLY NIOSH CERTIFIED RESPIRATORY PROTECTION. RESPIRATORY PROTECTION NOT NEEDED UNLESS PRODUCT IS HEATED OR MISTED.
Ventilation: VENTILATE AS NEEDED TO COMPLY WITH EXPOSURE LIMIT.
Gloves: IMPERVIOUS
Eyes: CHEMICAL WORKERS GOGGLES.
Other: EYE WASH STATION, IMPERVIOUS APRON AND FOOTWEAR.

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## IX. SPECIAL PRECAUTIONS

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Special precaution: KEEP OUT OF REACH OF CHILDREN. DO NOT STORE WITH FOOD, FEED, OR OTHER MATERIAL TO BE USED OR CONSUMED BY HUMANS OR ANIMALS. DO NOT CONTAMINATE WATER SUPPLIES, LAKES, STREAMS, OR PONDS. DO NOT STORE NEAR OPEN HEAT OR FLAMES. DO NOT STORE WITH OXIDIZING AGENTS OR AMMONIUM NITRATE FERTILIZER. KEEP CONTAINER CLOSED, DO NOT ALLOW WATER TO BE INTRODUCED TO THE CONTENTS OF THE CONTAINER.
Other precaution: CALIFORNIA REGISTRATION NUMBER 5905-50094-AA.

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## X. SHIPPING INFORMATION

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Shipping name: NOT REGULATED BY DOT, IATA, OR IMO.

Material Safety Data Sheet

Effective Date: 01-AUG-2012
Product: AGRI-DEX

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Hazard Class: NONE
Identification No: NONE
Labels Required: NONE
Placarding: NONE
Freight Class: ADHESIVES, ADJUVANTS, SPREADERS OR STICKERS, N.O.I. (NMFC ITEM 42652, CLASS 60)

| Chemical Name | Equivalent R.Q. |
|---|---|
| NOT APPLICABLE | NOT APPLICABLE |

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## XI. GENERAL PRODUCT INFORMATION

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National Fire Protection Association Rating:
(Rating level: 4-Extreme, 3-High, 2-Moderate, 1-Slight, 0-Minimum

Health: 1 Fire: 1 Reactivity: 0

S.A.R.A. Title III Hazard Classification: (Yes/No)

Immediate (Acute) Health: Y Delayed (Chronic) Health: N
Sudden Release of pressure: N Fire: N
Reactive: N

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Mail inquiries to: 225 Schilling Blvd., Suite 300 Collierville, TN 38017
Helena Chemical Company believes that the data contained herein is factual. This data is not to be taken as a warranty or representation of legal responsibility. It is offered solely for your consideration, investigation and verification.

# Competitor Label and MSDS

WILBUR-ELLIS®

# COMPETITOR®

## Modified Vegetable Oil

CPDA Certified

U.S. Patent No. 5,631,205

CA Reg. No. 2935-50173 WA Reg. No. 2935-04001

| PRINCIPAL FUNCTIONING AGENTS | % By Wt. |
|---|---|
| Ethyl Oleate, Sorbitan Alkylpolyethoxylate Ester, Dialkyl Polyoxyethylene Glycol | 98% |
| Constituents Ineffective as spray adjuvant | 2% |
| Total | 100% |

KEEP OUT OF REACH OF CHILDREN

CAUTION

### PRECAUTIONARY STATEMENTS
### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. Avoid breathing vapors or spray mist. Avoid contact with skin, eyes or clothing. Causes eye and skin irritation. Do not get in eyes, on skin or on clothing. Wear proper eye protection to reduce splash exposure. Wear protective gloves and proper personal protective equipment to reduce skin exposure. Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before reuse. This product may cause an allergic reaction in sensitive individuals.

### FIRST AID

**IF SWALLOWED**, Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person. **IF IN EYES**, Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice. **IF ON SKIN OR CLOTHING**, Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. **IF INHALED**, Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE REGULATIONS.

Read label of pesticide carefully. Keep container tightly closed and DO NOT allow water to be introduced to contents of this container.

### GENERAL INFORMATION

COMPETITOR is a Modified Vegetable Oil containing a non-ionic emulsifier system. COMPETITOR can be used with products where a modified vegetable oil or crop oil concentrate is recommended.

### PREPARATION OF SPRAY MATERIAL

Fill spray tank one-half full of water. Add the required amount of pesticide while agitating. Add remainder of the water. Add the recommended amount of COMPETITOR last and continue agitation until completion of spraying.

### DIRECTIONS FOR USE

**Aquatics:** COMPETITOR may be used as an additive with aquatically labeled pesticides. The use rates for COMPETITOR should follow the recommended adjuvant rate that is specified on the pesticide product label.

If there is no recommended adjuvant rate on the pesticide label, COMPETITOR should be used at the rate of 1 to 2 pints per acre in 5-30 gallons of water. For volumes greater than 30 gallons of water, do not exceed a rate of 1% volume/volume.

For handgun or backpack applications, do not exceed a rate of 5% volume/volume.

**Herbicides:** Use 1 to 4 pints of COMPETITOR per acre. The addition of a nitrogen fertilizer such as 28%-32% N solution or ammonium sulfate may be required to improve control under extreme environmental conditions or to satisfy certain label requirements. For over-the-Top Application, use caution at the higher application rates when temperatures exceed 85$^{o}$ F on sensitive crops such as seedling alfalfa.

**Insecticides:** Use 1/2 to 2 pints per 100 gallons of spray mix or use 1/4 to 1 pint per acre in concentrate sprays of 50 gallons or less.

For pesticides/herbicides that permit use of an adjuvant at a higher rate, follow instructions on that pesticide/herbicide label. **HOWEVER, DO NOT ADD THIS PRODUCT AT A RATE WHICH EXCEEDS 5% OF THE FINISHED SPRAY VOLUME, EXCEPT WHEN USED AS A DILUENT IN DORMANT, BASAL, SITE PREPARATION OR OTHER SIMILAR APPLICATIONS, PER LABEL INSTRUCTIONS.**

Use caution at the higher application rates. When applying to a sensitive crop, first treat a small area to determine if there may be adverse effects on the crop.

### STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage, disposal or cleaning of equipment. Open dumping is prohibited.
**STORAGE:** Keep product in original container. Do not put concentrate or dilute into food or drink containers. For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC (800) 424-9300.
**PESTICIDE DISPOSAL:** Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
**CONTAINER DISPOSAL:** Triple rinse (or equivalent). Do not reuse container. Offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**NET CONTENTS: _____GALLON(S)**

Manufactured by:

**WILBUR-ELLIS COMPANY**
PO BOX 16458 – FRESNO CA 93755

Specimen

Conditions of Sale and Limitation of Warranty and Liability:

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using the product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

**ALL STATEMENTS MADE HEREIN ARE SUBJECT TO APPLICABLE LAW, AND TO THE EXTENT THERE IS ANY INCONSISTENCY OR CONTENTION, APPLICABLE LAW SHALL GOVERN.**

The Directions for Use of the product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness, or other unintended consequences may result because of many different factors including, without limitation, manner of use or application, weather, combination with other products, or crop conditions. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold Manufacturer and Seller harmless from any claims relating to such factors.

**Seller warrants that this product conforms to the chemical description on the label. EXCEPT FOR THIS WARRANTY, THE PRODUCT IS FURNISHED "AS-IS," AND NEITHER SELLER NOR MANUFACTURER MAKES ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE SELECTION, PURCHASE OR USE OF THIS PRODUCT; SELLER AND MANUFACTURER SPECIFICALLY DISCLAIM ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE BEYOND WHAT IS STATED ON THE LABEL. Buyer and User accept all risks arising from any use of this product, including without limitation, uses contrary to label instructions, or under conditions not reasonably foreseeable to (or beyond the control of) Seller or Manufacturer.**

Neither Manufacturer nor Seller shall be liable for any incidental, consequential or special damages resulting from the use or handling of this product. THE EXCLUSIVE REMEDY OF THE BUYER OR USER, AND THE EXCLUSIVE LIABILITY OF MANUFACTURER AND SELLER, FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THIS PRODUCT, OR, AT THE ELECTION OF MANUFACTURER OR SELLER, THE REPLACEMENT OF THE PRODUCT.

These Conditions of Sale and Limitation of Warranty and Liability shall be interpreted, unless otherwise required by the law of the state of purchase, in accordance with the laws of the State of California, excluding its conflicts of laws rules, and may not be amended by any oral or written agreement.

WILBUR-ELLIS Logo® and COMPETITOR® are registered trademarks of WILBUR-ELLIS Company.

F-033108-2

IN CASE OF EMERGENCY,
CALL CHEMTREC: (800) 424-9300

Specimen

# MATERIAL SAFETY DATA SHEET

# Competitor

## Modified Vegetable Oil

### I. NAME
PRODUCT/TRADE NAME: COMPETITOR
EPA REGISTRATION #: NONE
CHEMICAL NAME/COMMON NAME:
Ethyl Oleate/Ethyloleate

### II. HAZARDOUS INGREDIENTS

| | CAS# | OSHA PEL | ACGIH TLV |
|---|---|---|---|
| Ethyloleate | 111-62-6 | NE | NE |

### III. PHYSICAL DATA
SPECIFIC GRAVITY (H2O = 1): 0.9
MELTING POINT: NA
VAPOR DENSITY (AIR = 1): NE
% VOLATILES BY VOL.: NE
ODOR: Fatty
APPEARANCE: Amber Liquid
FLASH POINT/METHOD: >150 Deg. C
VAPOR PRESSURE (mmHg): NE
SOLUBILITY IN H2O: Emulsifiable

### IV. FIRE & EXPLOSION HAZARD
EXTINGUISHING MEDIA: [ ] Water Fog [X] Foam [ ]Alcohol Foam
[X] CO2 [X] Dry Chemical [ ] Other
FIRE FIGHTING PRECAUTIONS & HAZARDS:
Fight fire upwind. Wear positive pressure self-contained breathing apparatus and full protective clothing. Do not breathe smoke or spray mist. Avoid fallout and runoff. Dike to prevent entering drains, sewers, or water courses. Evacuate people downwind from fire.

### V. CARCINOGEN STATUS
[ ] OSHA [ ] NTP [ ] ARC [X] No Listing Type

### VI. REACTIVITY
[X] Stable HAZARDOUS POLYMERIZATION
[ ] Unstable [ ] May Occur [X] Will Not Occur
AVOID: Strong oxidizers, organic material
HAZARDOUS DECOMPOSITION PRODUCTS: COx

### VII. SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN IN CASE OF SPILL: Absorb with inert material and sweep or vacuum into disposal container.
DECONTAMINATION: Treat spill area with detergent and water. Absorb with inert material. Place in disposal container and repeat procedure as necessary until area is clean.
ENVIRONMENTAL HAZARDS: Dike to prevent entering drains, sewers or water courses.
DISPOSAL: Dispose of in accordance with Federal, State and local regulations.

### VIII. HEALTH PRECAUTION DATA
INGESTION: Do not ingest. Acute Oral LD50 (Rats) >5000 mg/kg (WECO). Wash thoroughly before eating, drinking or smoking.
INHALATION: No PEL/TLV established for this product. Do not inhale mist. Use proper respiratory protective equipment for exposures encountered.
SKIN ABSORPTION: Acute Dermal LD50 (Rabbits) >5000 mg/kg (WECO). May cause moderate skin irritation. Wear proper personal protective equipment to reduce skin exposure.
EYE EXPOSURE: Keep out of eyes. Minimally irriting to eyes. If exposed, flush eyes for a minimum of 15 minutes with water. Wear proper eye protection to reduce splash exposure.
EFFECTS OF OVEREXPOSURE: Material is not toxic or irritating to the skin. No known chronic effects. No known preexisting medical conditions will be aggravated by exposure.
FIRST AID: In all cases, get prompt medical attention. If ingested, give several glasses of water and induce vomiting. Do not induce vomiting if person is unconscious. For skin exposure, remove contaminated clothing and wash with soap and water. For eye contact, irrigate for a minimum of 15 minutes with water. If inhaled, remove victim to fresh air, and administer CPR if necessary.

### IX. SPECIAL PROTECTION INFORMATION
RESPIRATORY PROTECTION: Use NIOSH/MSHA - approved respirator for organic vapors for the exposures encountered. Positive pressure self-contained breathing apparatus should be used for confined space entry and excessive exposures.
PERSONAL PROTECTIVE EQUIPMENT: Neoprene or rubber gloves and safety goggles.
VENTILATION: General ventilation.

### X. SPECIAL PRECAUTIONS
Keep out of the reach of children. Read and follow all label instructions.

### XI. REGULATORY DATA
SARA HAZARD CLASS: [X] Acute [ ] Chronic [ ] Flammable
[ ] Pressure [ ] Reactive [ ] None
SARA 313: [ ] Yes [X] No Chemical:
SARA 302: [ ] Yes [X] No Chemical:
TPQ:
CERCLA: [ ] Yes [X] No Chemical:
RQ:
RCRA: [ ] Yes [X] No

| NFPA HAZARD RATING: | | NFPA HAZARD RATING SCALE: | |
|---|---|---|---|
| Health: | [1] | 0 = Minimal | 3 = Serious |
| Fire: | [1] | 1 = Slight | 4 = Severe |
| Reactivity: | [0] | 2 = Moderate | |
| Special: | [ ] | | |
| HMIS CODES: | | HMIS HAZARD RATING SCALE: | |
| Health: | [1] | 0 = Minimal | 3 = Serious |
| Fire: | [1] | 1 = Slight | 4 = Severe |
| Reactivity: | [0] | 2 = Moderate | |

DATE PREPARED: October 8, 2003
REVISED DATE: April 6, 2010

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*Technical Material NE - Not Established NA - Not Applicable

**24 Hour Emergency Phone Number**
**CHEMTREC: (800) 424-9300**

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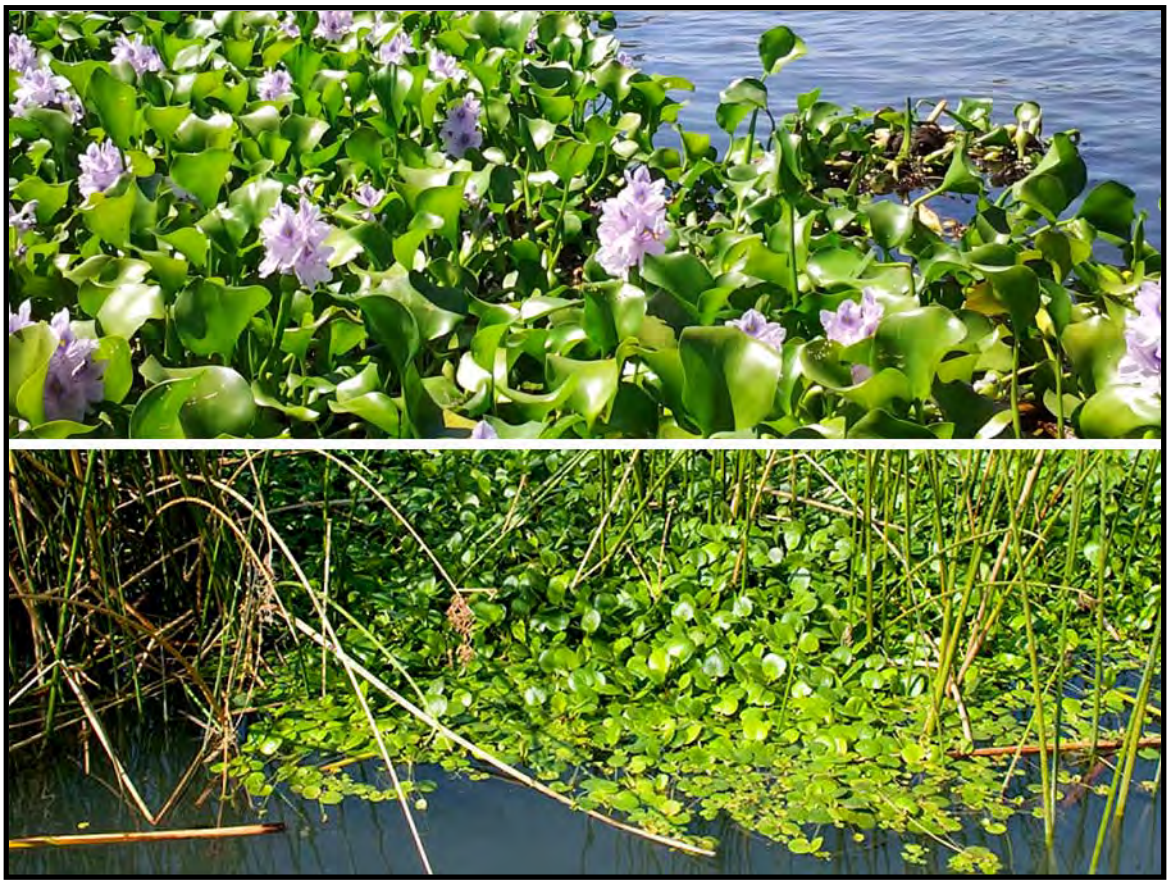
## Appendix C

# WHCP and SCP Operations Management Plan



# CALIFORNIA DEPARTMENT OF PARKS AND RECREATION
# DIVISION OF BOATING AND WATERWAYS

## WHCP & SCP Operations Management Plan

**May 15, 2014**

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# 1. INTRODUCTION

The California Department of Parks and Recreation, Division of Boating and Waterways[1] (DBW) operates the Water Hyacinth Control Program (WHCP) and Spongeplant Control Program (SCP). The WHCP is a well-established program, operating in the Delta for over 30 years. In 1982, in response to concerns about water hyacinth in the Delta, the California Legislature passed Senate Bill 1344 (Garamendi, Chapter 263, Statutes of 1982), designating DBW as the lead agency for controlling water hyacinth in the Delta, its tributaries, and Suisun Marsh. DBW subsequently initiated the WHCP in 1983.

The SCP is a new program to address the infestation of South American spongeplant (*Limnobium laevigatum*). In 2012, in response to concerns about significant negative impacts of spongeplant in Delta waters, the California Legislature passed Assembly Bill 1540 (Buchanan, Chapter 188, Statutes of 2012), designating DBW as the lead agency for controlling spongeplant in the Delta, its tributaries, and Suisun Marsh. In developing the SCP, DBW is working closely with the United States Department of Agriculture, Agricultural Research Service (USDA-ARS).

One of the goals of WHCP and SCP is to keep waterways safe and navigable by controlling the growth and spread of water hyacinth and spongeplant in the Delta and its surrounding tributaries. Because of the continued survivability and persistence of water hyacinth, and growing presence of spongeplant, WHCP and SCP legislative mandates are for control, rather than eradication, of water hyacinth and spongeplant in the Delta. Because the two programs are extremely similar, DBW will utilize this operations management plan for both the WHCP and SCP. This manual will use the general term “Program”, in cases that the operations management plan (OMP) specifications relate to both WHCP and SCP.

Other goals of the program include minimizing negative impacts of these non-native invasive plants on navigation, public safety, recreation, agricultural activities, drinking water quality, and ecosystem services in Delta waterways. The program balances potential impacts of water hyacinth and spongeplant management by working to minimize non-target species impacts and to prevent environmental degradation in Delta waterways and tributaries.

The program operates under several environmental permits and documents that include descriptions, provisions, and requirements that guide program activities. These currently include the following:

- ❑ National Pollution Discharge Elimination System (NPDES) Statewide General Permit (CAG990005, to expire on November 30, 2018, by Water Quality Order 2013-0002-DWQ)
- ❑ WHCP Programmatic Environmental Impact Report (PEIR) (November 2009) and Addendum to the PEIR (August 2013)
- ❑ SCP PEIR (Draft PEIR dated May 15, 2014 and Final PEIR forthcoming)
- ❑ National Marine Fisheries Service (NMFS) Water Hyacinth Letter of Concurrence (February 27, 2013) (through 2017)
- ❑ NMFS Spongeplant Letter of Concurrence (currently in the consultation process)
- ❑ United States Fish and Wildlife Service (USFWS) Water Hyacinth Biological Opinion (BO) (March 13, 2013)
- ❑ USFWS Spongeplant BO (currently in the consultation process).

[1] As of July 1, 2013, the California Department of Boating and Waterways became the Division of Boating and Waterways within the California Department of Parks and Recreation. DBW applies to Department of Boating and Waterways or Division of Boating and Waterways.

The WHCP and SCP apply Integrated Pest Management (IPM) and Maintenance Control Practices (MCP). IPM denotes the coordinated use of available control methods for a particular pest. DBW aquatic weed program activities emphasize chemical treatment, supported by limited handpicking, hand removal, herding, mechanical removal, and evaluation of biological controls. **Figure 1-1,** below, provides the months in which key Program activities may occur.

**Figure 1-1**
**Calendar of Treatment Activities for WHCP and SCP**

| Activity | JAN | FEB | MAR[a] | APR | MAY | JUNE | JULY | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Environmental Surveys | | | | | | | | | | | | |
| Surveyor Training | | | | | | | | | | | | |
| Coverage Surveys | | | | | | | | | | | | |
| 2,4-D Treatment[b] | | | | | | | | | | | | |
| Glyphosate Treatment | | | | | | | | | | | | |
| Penoxsulam Treatment[c] | | | | | | | | | | | | |
| Imazamox Treatment[d] | | | | | | | | | | | | |
| Diquat Treatment[e] | | | | | | | | | | | | |
| Herbicide Monitoring | | | | | | | | | | | | |
| Handpicking/ Hand Removal with Nets | | | | | | | | | | | | |
| Herding | | | | | | | | | | | | |
| Mechanical Removal[f] | | | | | | | | | | | | |
| Reporting | | | | | | | | | | | | |
| Program Key: | | | SCP | | | Both | | | | | | |

[a] The March start date for herbicide treatment would be dependent on temperature and fish surveys

[b] 2,4-D may be used in the legal Delta between June 15th and September 15th, and in southern sites between July 15th and August 15th (indicated by the darker shading)

[c] Penoxsulam (Galleon by SePRO Inc.) was approved by California Department of Pesticide Regulation (CDPR) for aquatic use in 2009, and is new to the program

[d] Imazamox (Clearcast by SePRO Inc.) was approved by CDPR for aquatic use in 2012, and is new to the program

[e] Diquat will only be used in the SCP. Diquat will only be used from August 1st through November 30th of each year, and will be limited to a total of 50 treatment acres in the Delta per year, as a sum of the combined diquat acres treated in the SCP and EDCP. Diquat will be utilized as part of the SCP under emergency conditions only. Emergency conditions are such that spongeplant growth completely impedes navigation of Delta waters, such as a completely blocked slough that would impair the movement of emergency response vessels

[f] Mechanical harvesting is restricted in May and June to avoid potential impacts to listed fish species.

The DBW implements the WHCP, the new SCP, and the *Egeria densa* Control Program (EDCP). Staffing for these programs includes: an Environmental Program Manager, a Field Supervisor, a Senior Environmental Scientist, Field Environmental Scientists, a GIS Mapping Specialist, Administrative Staff, Aquatic Pest Control Specialists, and Aquatic Pest Control Technicians. DBW management provides support and oversight of all three weed control programs. USDA-ARS assists DBW by providing research, technical, and programmatic support. USDA-ARS serves as the federal nexus to NMFS and USFWS for Endangered Species Act (ESA) compliance.

The purpose of this WHCP and SCP Operations Management Plan (OMP or Plan) is to summarize program activities and requirements for Aquatic Pest Control Specialists and Aquatic Pest Control Technicians.

The remainder of this OMP is organized as follows:

- Section 2 – Overview of Program Activities – a summary of activities conducted by program supervisors and environmental scientists
- Section 3 – Aquatic Pest Control Specialist and Technician Activities and Requirements – summary of activities and requirements related to herbicide applications
- Section 4 – Best Management Practices – descriptions of six BMPs
- Appendices – supporting program documentation and resources.

# 2. Overview of Program Activities

The program is guided by many different requirements and regulations. This section of the OMP provides an overview of program activities that fulfill these requirements. The purpose of this section is to provide Aquatic Pest Control staff with an overview of how their activities fit within the overall program.

## A. Pre-Season Prioritization

DBW has divided the Delta into zones (generally within the west, north, central, and south). These zones are further divided into numbered "sites." Sites vary in size (between 5 and 1,700 acres), and may be between one and three miles in length. Maps showing the Program treatment sites are provided in **Appendix A.**

Prior to the start of each treatment season, DBW and USDA-ARS will prioritize treatment sites and methods. The prioritization process will be based on results of pre-season field surveys combined with the aquatic pest control staff's experience and knowledge of water hyacinth and spongeplant growth patterns.

During pre-season field surveys, treatment crews will survey treatment sites and identify the amount of acres infested. This pre-season infestation figure is only one indicator, as water hyacinth and spongeplant may be dormant during the winter, and may die back in cold weather. To prioritize sites, the Environmental Program Manager, Field Supervisor and Environmental Scientists will review sites and rank sites on several factors, including: (1) whether or not the site is a nursery area, (2) current infestation levels, (3) potential for infestation, and (4) whether the site is important for navigation, public safety, irrigation, agriculture, recreation, and/or commercial use. DBW considers other factors when prioritizing sites, such as the presence of temporary barriers.

Treatment sites are scored on each of these factors. The team calculates a total priority score for each site and prepares an initial priority ranking. DBW may employ aerial surveys or other appropriate remote sensing methods to assist in site prioritization, as well as follow-up evaluation. Staff will present the priority ranking to DBW management and USDA-ARS, who then evaluate and approve an initial treatment plan for the season.

At the current low spongeplant infestation levels, DBW and USDA-ARS will classify all spongeplant locations as high priority sites. Should the spongeplant invasion reach a point that DBW cannot treat all infestations, DBW and USDA-ARS will prioritize treatment sites and methods prior to the start of each treatment season. When infestations are small, treatment crews will hand remove spongeplant with nets during the course of the field survey, or soon after.

This initial plan indicates the general priority for site treatment. The plan can shift during the treatment season, as water hyacinth and spongeplant move throughout the Delta, and may grow more rapidly in certain areas. Treatment crews continue to monitor and record total acres infested, by plant and site, throughout the treatment season, in order to provide management with information they need to focus treatments to high priority sites. Wind and weather conditions also dictate when a particular site can or cannot be chemically treated. In addition, treatment crews return to sites for additional chemical treatments during the season when field surveys indicate presence of persistent or new infestations.

## B. WHCP and SCP Herbicides and Adjuvants

The WHCP currently has approval to utilize four herbicides and two adjuvants. The SCP also will utilize the four herbicides and two adjuvants approved for the WHCP, as well as diquat (in limited quantities and emergency conditions. The approved herbicides and adjuvants are as follows:

### *Herbicides*

- **2,4-D** (2,4-Dichlorophenoxyacetic acid, dimethylamine (DMA) salt (Weedar® 64) EPA Reg. No.71368-1 – 2,4-D was the primary WHCP treatment option between 1983 and 2012. Current restrictions in timing and locations where 2,4-D can be applied have led to a reduction in overall 2,4-D use
- **Glyphosate** (Roundup Custom™) EPA Reg. No.524-343 – glyphosate has also been utilized since the program's inception, and has recently been applied on more total acreage in response to 2,4-D restrictions
- **Penoxsulam** (Galleon*) EPA Reg. No.67690-47 – penoxsulam is a new program herbicide, approved for program use in 2013. DBW will conduct monitoring at the initial treatment sites to develop a baseline for expected herbicide concentrations
- **Imazamox** (Clearcast®) EPA Reg. No.241-437-67690 – imazamox is a new program herbicide, approved for program use in 2013. DBW will conduct monitoring at the initial treatment sites to develop a baseline for expected herbicide concentrations
- **Diquat** (Reward®) EPA Reg. No.100-1091 – diquat is for use in the SCP, and not the WHCP. The SCP will utilize diquat only in certain cases where more rapid efficacy is required, and when listed fish species are not likely to be present.

### *Adjuvants*

- Agridex® – Agridex is a non-ionic blend of surfactants and spray oil that results in a more even and uniform spray deposit. The WHCP has utilized Agridex as the primary program adjuvant since 2006
- Competitor® – Competitor is a modified vegetable oil containing a non-ionic emulsifier system. Competitor was approved for program use in 2013.

Labels and Material Safety Data Sheets (MSDSs) are provided for the five herbicides and two adjuvants in **Appendix B**. Additional herbicides and adjuvants may be added to the program as they are approved.

## C. Herbicide Use Reporting Requirements

The Field Supervisor is responsible for several activities related to planning and reporting program herbicide use prior to, and during, the chemical treatment season.

### *Pest Control Recommendations*

For each season, a licensed Pest Control Advisor (PCA) shall write the Pest Control Recommendations (PCR) for all chemical treatment areas. Contract applicators must operate under all Program permits and this OMP. Contract applicators must use all equipment and aquatic herbicides legally, and are responsible for filing Daily Logs, weekly Notice of Intents (NOIs), and monthly Pesticide Use Reports (PURs) with DBW and other regulatory agencies.

Treatment crews should:

- ❑ Have a copy of the appropriate PCR with them at time of application
- ❑ Understand and follow the PCR before making an application. If clarification is necessary, contact the Field Supervisor
- ❑ Follow PCR application rates, hazard and use restrictions, and application protocols
- ❑ Record the PCR application rate on the Daily Log at the time of application.

A sample PCR is provided in **Appendix E.**

### *County Agricultural Commissioner Notification*

Before a treatment can occur, the DBW Aquatic Weed Unit shall file PCRs and a Notice of Intent (NOI), as appropriate, with the County Agricultural Commissioner (CAC) office where chemical treatments occur. If necessary, the DBW Aquatic Weed Unit also shall obtain a Restricted Use Permit (RUP) from all appropriate CACs (see below). Prior to each treatment week, DBW will report the treatment sites to the respective CAC through the NOI. Prioritized sites are likely to change rapidly depending on the constant growth and movement of water hyacinth and spongeplant, as well as wind and weather conditions.

### *Restricted Use Permit (RUP)*

When an herbicide application utilizes a restricted use pesticide, DBW must obtain a RUP. 2,4-D is a restricted use pesticide that requires a RUP to be carried on board with the applicator. The original restricted use pesticide is kept on file in DBW's office.

The CAC may place additional measures and conditions on a proposed application for any restricted use pesticide. The CAC notifies DBW staff if additional provisions will apply to a particular treatment. In the event that a site borders two counties, and the two counties provide contrasting application requirements, DBW shall follow the more restrictive guideline(s).

Treatment crews shall be aware of, and implement, all RUP provisions. The Field Supervisor is responsible for communicating and training RUP provisions to treatment crews.

### *Notice of Intent (NOI)*

The Notice of Intent (NOI) identifies potential chemical treatment sites for each week for each treatment crew. NOIs are traditionally submitted to the CAC for restricted use pesticides only. However, DBW submits the weekly NOI to the CAC, Central Valley Regional Water Quality Control Board (CVRWQCB), NMFS, and USFWS for all herbicide treatments. The NOI typically includes more sites than will actually be treated to account for weather and wind conditions that may limit treatment in a given location. DBW is responsible for completing and submitting the NOIs for each week. Administrative staff may also assist in submitting NOIs.

To prepare the NOIs, the Field Supervisor, with input from staff, identifies the overall list of sites from the program prioritization process. Using the initial prioritization and management plan as a starting point, each field crew prioritizes their assigned sites weekly via a field survey of their area. Based on the management plan, the Field Supervisor determines weekly and daily spraying needs and assigns crews to sites based on wind, weather, tides, travel times, available personnel, results of fish surveys (to determine likely presence of listed fish species), equipment, and resources. It is the Specialist's responsibility to notify the Field Supervisor if any changes are to be made for a

**Protocol for Identifying and Reporting Early WHCP and SCP Treatment Sites**

1. DBW begins conducting regular field surveys in late-February to identify growing water hyacinth and spongeplant (seen as re-greening of winter stunted plants). These surveys focus on back-water and dead end locations and known nursery areas. DBW will document the locations and photograph the sites with areas of more than 100 square feet of growing water hyacinth and/or any spongeplant.
2. The Environmental Scientist compares these surveyed locations to the most recent state and federal fish monitoring data, including:
   a. USFWS "DatCall" data (juvenile fish monitoring program through the Interagency Ecology Program (IEP)
   b. California Department of Fish and Wildlife (DFW) surveys and studies
   c. California Department of Water Resources (DWR) and United States Bureau of Reclamation (USBR) fish salvage data
   d. FishBio San Joaquin Basin Update reports
   e. DFW Knights Landing Rotary Screw Trap data.
3. As often as weekly, between March 1 and July 1, the Environmental Scientist prepares a summary list including:
   a. Treatment site number(s) and map of potential early treatment sites
   b. Whether or not listed fish species are known to be present.
4. The Environmental Scientist emails this information to the primary technical contacts at USFWS and NMFS during the week prior to the proposed chemical treatment week.
5. The primary technical contacts at USFWS and NMFS may reply via email if they agree that the data show that listed fish are not likely to be present and that treatment may proceed. If USFWS or NMFS have questions or concerns about the potential treatment sites, they contact DBW's Environmental Scientist by email and/or telephone to discuss treatment options at the site.
6. Additionally for the SCP, DBW continues conducting field surveys and reporting re-growing spongeplant throughout the treatment season. Areas that show re-growth of spongeplant will be evaluated for presence of listed fish as appropriate based on time and location.

designated week. Specialists are responsible for communication with each other to plan for possible overlap in designated treatment zones. The following information is submitted in a weekly NOI:

- ❑ Aquatic Pest Control Specialist name and program (i.e., WHCP, SCP, or EDCP)
- ❑ Treatment Site number
- ❑ Spray dates
- ❑ County/counties where spraying will occur
- ❑ Herbicides and adjuvants to be used
- ❑ Acres to be treated.

Before submitting the NOI to the appropriate agencies, the Field Supervisor will consult with the Environmental Scientist to determine if the presence of endangered species may prevent a scheduled treatment. The Environmental Scientist consults several different fish surveys, as described in the sidebar, left. If listed fish species are likely to be present, the Field Supervisor or Environmental Scientist will identify alternate treatment sites for that week.

Many factors influence whether a site can be treated. As a result, it is possible that treatments can be cancelled up until, and including, the day of treatment. This is why the NOI submitted to the DBW Headquarters Office includes alternative sites. DBW Headquarters Office staff finalizes the NOIs, submits them to the appropriate CACs and other regulatory agencies, and sends a copy to the field office (Stockton). A sample copy of a NOI is provided in **Appendix D.**

### *MOU with the Contra Costa Water District*

The MOU is an agreement between the Contra Costa Water District (CCWD) and DBW. Generally, no treatment shall occur within Rock Slough, or within one mile of the confluence of Rock Slough and Old River, or within one mile of CCWD's Old River or Mallard Slough intake pumps without consensual agreement between CCWD and DBW. Herbicide treatments within one mile of CCWD's water intakes may only occur with prior consent of CCWD (the label only requires ½ mile). In order to treat within one mile of an intake, DBW must notify CCWD at least two weeks in advance, and make every reasonable attempt to schedule treatments during periods when CCWD's intakes are shut down for environmental or maintenance reasons, allowing at least two complete tidal cycles between treatment and restart. DBW will implement the same procedures for other treatments conducted within one mile of a drinking water intake pump. This measure is primarily aimed at reducing the potential for drinking water contamination from the program.

### *Pesticide Use Reports (PURs)*

The California Department of Pesticide Regulation (CDPR) requires monthly reporting of pesticide usage to CACs. CACs, in turn, report this data to CDPR, where it is summarized and reported. The program PURs are created from the Daily Logs generated by the field crews. DBW Headquarters staff compile monthly PURs in each county where treatments occur, and submit these to their respective CACs. DBW also compiles the Daily Log information to calculate total herbicide applied and acres treated each month and for the chemical treatment season. The Daily Logs are legally required to be accurate and complete, as they are the source of several program measurements.

### *Public Notifications*

The NPDES permit requires DBW to notify potentially affected public agencies prior to the first treatment of herbicide. DBW is required to notify potentially affected public agencies at least 15 days prior to the first chemical treatment. The notification includes the following information:

1. A statement of DBW's intent to apply aquatic herbicides
2. Names of the aquatic herbicides
3. Purpose of use
4. General time period and locations of expected use
5. Any water use restrictions or precautions during treatment
6. A phone number that interested persons may call to obtain additional information from DBW.

### *Contract Applicators*

If DBW uses other contract applicators to perform herbicide treatments for the Program, explicit and formal agreements (i.e., contracts) outlining roles and responsibilities are made between DBW and the contract applicators.

## D. Water Quality Monitoring

The program follows NPDES general permit requirements for residual aquatic pesticide discharges. The State Water Resources Control Board (SWRCB) general permit (Order No. 2013-0002-DWQ, General Permit No. CAG990005) went into effect on December 1, 2013, and expires on November 30, 2018. As specified in the WHCP and SCP PEIRs, DBW will follow NPDES monitoring requirements.

The general permit (CAG990005) requirement specifies that permitees meet monitoring and reporting program requirements, including a sampling frequency at a minimum of six (6) application events for each active ingredient in each environmental setting (flowing water and non-flowing water) per year, except for glyphosate. If the results from six consecutive application events show concentrations that are less than the receiving water limitation/trigger for an active ingredient, sampling shall be reduced to one (1) application event per year for that active ingredient in that environmental setting. For glyphosate, DBW will be required to collect one (1) sample from each environmental setting. DBW will continue to follow NPDES general permit requirements for residual aquatic pesticide discharges, if and when, they are revised.

The current NPDES permit sampling requirements are materially less than what has been historically measured (prior to December 13, 2013), in terms of frequency of measurement. To ensure that the program maintains environmental quality measures, meets federal ESA requirements, and that monitoring provides independent statistical validity, DBW seeks to maintain a more thorough monitoring plan than the minimal NPDES requirements.

# 3. Aquatic Pest Control Specialist and Technician Activities and Requirements

This section describes the activities and requirements of Aquatic Pest Control Specialists and Aquatic Pest Control Technicians (treatment crews or crews) to implement the Program. The section refers to Best Management Practices (BMPs) that are provided in Section 4 of this OMP. This section includes discussions of general requirements and responsibilities, chemical treatment day procedures, and other program activities.

## A. General Requirements and Responsibilities

### 1. Herbicide Applicator Responsibilities

*Certification*

All DBW application and contract applicators who apply aquatic herbicides for the WHCP, SCP and EDCP must have at least one employee with a current Qualified Applicators Certificate (QAC). The CDPR is responsible for examining and licensing QACs. All Aquatic Pest Control Specialists must have a current QAC.

The QAC signifies proficiency in:

- ❑ Reading and understanding pesticide labels
- ❑ Proper methods of mixing and applying pesticides
- ❑ Handling and disposing of pesticides and pesticide containers
- ❑ Recognizing pesticide poisoning symptoms
- ❑ Proper use of protective equipment.

To obtain a QAC for employment as an Aquatic Pest Control Specialist, an individual must pass the QAC examination, category “F” (Aquatic), administered by the CDPR. To assist an applicant with the examination, the CDPR website provides suggested study materials and applicable laws and regulations. For information on QAC testing and requirements, refer to the CDPR website at http://www.cdpr.ca.gov/docs/license/qac.htm.

To pass the Qualified Applicator Certificate examination, category “F” (Aquatic), applicators must demonstrate proficiency in:

- ❑ Principals of limited area application
- ❑ Water use situations and potential for downstream effects
- ❑ Secondary effects caused by incorrect formulations and faulty applications
- ❑ Competency, practical knowledge, and understanding of pesticide impacts to:
    - o Plants
    - o Fish
    - o Birds
    - o Beneficial insects
    - o Other organisms present in aquatic environments.

To retain possession of a QAC, the certificate holder must complete at least 20 hours of continuing education every two years (with a minimum of four hours covering the pesticide laws and regulations). Information on continuing education is provided on the CDPR website at http://www.cdpr.ca.gov/docs/license/conted.htm. The CDPR accredits, and posts the schedule for, continuing education classes.

### *Understanding Herbicide Labels*

Treatment crews are responsible for reading, understanding, and following herbicide label requirements. Herbicide labels and MSDSs are provided in **Appendix B** for the herbicides and adjuvants currently used: glyphosate, 2,4-D, imazamox, penoxsulam, diquat (SCP only), Agridex, and Competitor.

Treatment crews should use the following guidelines related to understanding herbicide labels:

- ❑ Consult the Field Supervisor for clarification on herbicide label requirements, use and storage, and safety procedures
- ❑ Ask questions before an application starts if any part of the application protocol or the PCR is not completely understood
- ❑ Do not apply any herbicides or adjuvants of any kind other than those currently authorized for the Program (i.e., 2,4-D, glyphosate, penoxsulam, imazamox, diquat (SCP only), Agridex and Competitor)
- ❑ Use of herbicides in specific locations and at specific times is limited by environmental compliance requirements and adjacent crops.

Labels and MSDSs are occasionally revised by the manufacturer. The Environmental Scientist and Field Supervisor shall ensure that this manual is updated to reflect the most current labels and MSDS prior to use by DBW treatment crews.

**Always follow the herbicide label.**

### *Proper Herbicide Application Methods*

Treatments shall be made according to registered herbicide label specifications and California Code of Regulations requirements. Together, these requirements are detailed in the following documents:

- ❑ 2,4-D label and MSDS
- ❑ Glyphosate label and MSDS
- ❑ Penoxsulam label and MSDS
- ❑ Imazamox label and MSDS
- ❑ Diquat label and MSDS
- ❑ Agridex label and MSDS
- ❑ Competitor label and MSDS
- ❑ Pest Control Recommendations (see sample in **Appendix E**).

### *Environmental Training and Mitigation*

Each treatment crew shall follow all environmental protocols required by applicable permits from the following agencies:

- ❑ U.S. Fish and Wildlife Service (USFWS), Biological Opinions, including Incidental Fish Take Provision **(Appendix G)**
- ❑ National Marine Fisheries Service (NOAA Fisheries), letters of concurrence **(Appendix H)**
- ❑ National Pollutant Discharge Elimination System (NPDES) General Permit **(Appendix I)**.

All personnel involved in the program receive required annual worker environmental awareness training provided by an Environmental Scientist. This training is provided prior to the start of the treatment season. This training is designed to identify special status species. Each trainee receives a *Species of Concern* identification manual. The *Species of Concern* manual includes detailed color photographs of special status species.

The training also includes a review of avoidance, minimization, and mitigation measures for Federal and State listed threatened and endangered species and the procedures for handling “take” (i.e., a species killed during an application). Trainees are provided a “take” kit which includes a:

- ❑ Whirlpac (to hold species taken)
- ❑ Blank chain-of-custody form (to record possession of take)
- ❑ Protocol for collection and notification of take
- ❑ Telephone list for whom to contact following a take.

Treatment crew members receive maps showing known locations of valley elderberry shrubs and giant garter snake habitat within the Program treatment areas.

## 2. Herbicide Handling Requirements

All field staff (including Field Supervisor, Aquatic Pest Control Specialists, and Aquatic Pest Control Technicians) shall follow requirements for storage, transport, mixing, loading applications, and container disposal. These requirements are described in **BMP #1**.

The Field Supervisor, or an entity designated by the Field Supervisor as qualified, provides herbicide handling training to all field staff in accordance with Title 3, Food and Agriculture, Division 6, of the California Code of Regulations, titled, “Pesticides and Pest Control Operations.” Copies of these regulations are included in **Appendix C**. It is particularly important that field staff clearly understand and follow the sections:

- ❑ Storage, Transportation and Disposal (Chapter 3, Subchapter 2, Article 4)
  - o Container control
  - o Delivery of pesticide containers
  - o Container requirements
  - o Transportation
  - o Rinse and drain procedures

- ❑ General Safety Requirements (Chapter 3, Subchapter 3, Article 2)
  - o Handler training
  - o Emergency medical care
  - o Medical supervision (not applicable at this time)
  - o Working alone
  - o Change area
  - o Handler decontamination facilities
  - o Coveralls
  - o Personal protective equipment
  - o Adequate light
  - o Safe equipment
  - o Equipment maintenance
  - o Closed systems.

Each treatment crew will have a cellular telephone to use to communicate with the Environmental Program Manager, Field Supervisor, Environmental Scientists, and to use in case of emergencies. A list of medical and emergency telephone numbers, including local hospital contacts, is provided in **Appendix F**. In case of injury, the treatment crew should immediately contact the hospital within the County that the injury occurred. Treatment crew members should keep these contact telephone numbers in their possession.

### 3. Herbicide Application Equipment Calibration Requirements

All field staff shall follow equipment calibration procedures for each type of herbicide. These procedures are provided in **Appendix Q** and summarized in **BMP #2**. Calibration occurs more often when a pump is changed, or each time a different herbicide is used. However, calibration occurs at a minimum of once per month.

Prior to the treatment season, all treatment crews are trained on the use of any new technology recently integrated into the program. These pieces of equipment may be used to take water quality and location measurements throughout the treatment season. The treatment crews are responsible for understanding the technology and applications that are an accepted part of the programs. If there are any concerns, treatment crews should contact the Environmental Scientists before the treatment season begins. Treatment crews should also contact office staff <u>immediately</u> if there are problems with the monitoring equipment. The problem should be noted on the Daily Log for that day.

### 4. Hazmat and Spill Contingency Requirements

In the event of an aquatic or terrestrial spill, all treatment crew members shall follow the Spill Contingency Plan outlined in **BMP #3**. This BMP includes procedures for spill prevention, cleanup, and notification.

## B. Chemical Treatment Day Procedures

### *Day of Treatment Boat and Herbicide Checkout*

On the day of chemical treatment, the treatment crews drive the truck down to the storage bay where the boat is stored on its trailer. The treatment crew then attaches the boat and trailer to the truck's trailer hitch. The treatment crew performs visual inspections of truck, trailer, and boat to ensure vehicles are safe to transport on the roadways or navigate throughout the waterways.

The treatment crew should review to ensure that the following equipment and gear is in the boat or truck prior to leaving the dock or storage bay:

- ❑ Personal protective equipment: depending on herbicide, may include:
  - o Caution signal words
    - ▪ Spray glasses
    - ▪ Gloves (including disposables)
  - o Danger signal words
    - ▪ Coveralls
    - ▪ Chemical apron
    - ▪ Shoe protective coverings
    - ▪ Face shield or goggles
    - ▪ Waterproof shoes and socks
- ❑ Lifejacket(s)
- ❑ Herbicide(s) and adjuvant(s)
- ❑ Cellular telephone
- ❑ First aid kit
- ❑ Fire extinguisher
- ❑ Tools
- ❑ Spill kit
- ❑ Sunscreen (optional)
- ❑ Mosquito repellent (optional)
- ❑ Waterproof gear bag which includes:
  - o Permits
  - o Written recommendations
  - o Maps
  - o Take kit
  - o DO meter and manual
  - o Computer tablet

- Camera
- Wind gauge
- Emergency eye wash.

On the Daily Log, the treatment crew should complete the volume data information by noting the amount of chemical, in gallons, checked out of the DBW warehouse.

### *Pre-Treatment Procedures*

The treatment crew records the following information on the Daily Log:

- ❑ Date
- ❑ Crew (names)
- ❑ Boat number
- ❑ Hour meter (start)
- ❑ Date regular maintenance performed on boat (and answer associated questions in maintenance box)
- ❑ Treatment site number
- ❑ County
- ❑ Hours (beginning time).

The treatment crew should perform a visual survey for the species of concern and complete the Environmental Observations Checklist. All boxes must be completed on the Environmental Observations Checklist. If no species is observed, the treatment crew should check “no” in the appropriate box on the form. Treatment crews will survey and document the applicable species of concern. This is a brief survey. A sample of the Environmental Observations Checklist is provided in **Appendix J**. If any sensitive species are present at the site, the treatment crew should not perform chemical treatment.

The treatment crew should utilize the DO monitor/meter to take DO and temperature readings and record the following information on the Daily Log:

- ❑ Water temperature using the DO meter (beginning of treatment)
- ❑ DO level using the DO meter (beginning of treatment)
- ❑ Beginning UTM using the GPS device
- ❑ Date of last spray equipment calibration.

The treatment crew should use the wind meter available on each boat to measure the wind speed and record this information in the Daily Log. If the wind speed at a potential treatment site is greater than 10 mph or as per site specific requirements (7 mph in Contra Costa County), the treatment crew should not perform the treatment at that point of application. On days where wind and weather could be a factor in worker safety, and/or compromises the effectiveness of an application, the Specialist may call off the application.

Concurrent with completing the hard copy of the Daily Log, the treatment crew also completes electronic data collection using the DBW Aquatic Weed Delta Collection System electronic program. This program runs using a handheld computer which is connected to the

various electronic equipment devices in the field. The program is based on "pull down" menus, and is used by treatment crews to record the following information (see **Appendix N** for Tablet Instructions):

- ❑ Quantity of chemical – beginning of day
- ❑ Quantity of chemical – end of day
- ❑ Quantity of chemical used during the day
- ❑ Date
- ❑ Treatment site number
- ❑ Boat number
- ❑ Personnel names
- ❑ Herbicide used
- ❑ Herbicide units (i.e. gallons)
- ❑ Herbicide rate and orifice size
- ❑ UTM (Universal Transverse Mercator) data
- ❑ Coordinates of spray line
- ❑ Dissolved oxygen
- ❑ Temperature
- ❑ Wind speed
- ❑ Presence of elderberry shrubs
- ❑ Presence of species of concern
- ❑ Calibration information
- ❑ Leak inspection notes.

Based on this pre-treatment data, the treatment crew should determine whether the application meets applicable NPDES permit conditions for a treatment. No treatment can be performed when DO is between 3.0 mg/liter and the basin plan limits as follows: (also see DO maps in **Appendix A**)

- ❑ 7.0 mg/L in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge
- ❑ 6.0 mg/L in the San Joaquin River (between Turner Cut and Stockton), September 1 through November 30
- ❑ 5.0 mg/L in all other Delta waters
- ❑ 5.0 mg/L in the San Joaquin River, south to Mendota Pool
- ❑ 7.0 mg/L in the Tuolumne River, east to Site 711
- ❑ 8.0 mg/L in the Tuolumne River from site 711 and east between October 15 and June 15, and 7.0 mg/L between June 16 and October 14
- ❑ 7.0 mg/L in the Merced River, east to Site 512
- ❑ 8.0 mg/L in the Merced River from Site 512 and east

- ❑ 7.0 mg/L in the San Joaquin River, east of Mendota Pool, and in Fresno Slough
- ❑ In addition to these limits, do not initiate a diquat treatment if measured DO levels are between 3.0 and 5.0 mg/L.

The treatment crew also should ensure that applications will meet site specific requirements. A copy of the Memoranda of Understanding with CCWD is provided in **Appendix O**. Treatment crews will notify the appropriate jurisdiction at least two weeks in advance of treating within one mile of a drinking water intake, and coordinate as needed to protect drinking water quality.

In cases where the treatment requires water sampling, the treatment crew should coordinate with the monitoring crew. At the site, the monitoring crew and treatment crew should discuss how the site will be treated (based on tidal factors). The treatment crew should flag both the start of the application area and the end of the application area. The monitoring crew will take a pre-treatment sample. The treatment crew will spray the site until plants are treated as per the herbicide label. The monitoring crew will then take post-treatment samples at least one hour following the pre-treatment sample.

### *Treatment*

The treatment crew will calibrate the spray equipment, as needed, and conduct the treatment. The treatment shall be conducted at labeled rates and consistent with the PCR and Fish Passage Protocol. A copy of the Fish Passage Protocol is provided in **Appendix K**. The treatment crew shall leave an adequate portion of a waterway open (i.e., without treatment) to allow for fish to pass through the treatment site.

### *Post-Treatment*

The treatment crew records the amount and type(s) of herbicides and adjuvants used during each application on the Daily Log. All treatment crews complete a Daily Log, including the following information:

- ❑ Hour meter (end)
- ❑ Water temperature using the DO meter (end of treatment)
- ❑ Hours (ending time)
- ❑ Dissolved oxygen level using the DO meter (end of treatment)
- ❑ Ending UTM using the GPS device (end of treatment)
- ❑ Total acres treated (each treatment)
- ❑ Orifice size
- ❑ Amount of herbicide and adjuvant used and rate of application. Glyphosate is recorded in gallons. 2,4-D is recorded in gallons. Penoxsulam is recorded in ounces. Imazamox is recorded in ounces. Diquat is recorded in gallons per surface acre. Agridex is recorded in gallons. Competitor is recorded in gallons. Consult each site PCR for rate information. **Appendix L** provides an ounce to gallon conversion table
- ❑ Amount of unused herbicide and adjuvant.

A sample copy of a Daily Log is provided in **Appendix M**.

Once the fieldwork is complete, the treatment crews submit Daily Logs to Headquarters office. Headquarters office staff maintain and track all appropriate data.

Headquarters will regularly (i.e., weekly) download field data collected using the GPS devices. Headquarters Staff compares this data with data from the Daily Logs for accuracy and integrity.

The Field Supervisor conducts a quality control/quality assurance assessment of the Daily Log information which is submitted to DBW Headquarters. The Field Supervisor reviews Daily Logs to ensure all information is included and the information is accurate and correct. The Field Supervisor signs off the Daily Logs, verifying that all information is accurate.

DBW Headquarters staff prepares a PUR to each relevant CAC that includes the amount of herbicide used, acreage, and number of treatments. This report is submitted to the CAC on a monthly basis.

### *Day of Treatment Boat and Herbicide Return*

At the end of the day, the treatment crew should:

- ❑ Check the bilge for contaminants, perform an overall visual inspection of the boat, check the boat for tightness (i.e., no leaks) and record boat hours for the day
- ❑ Load the boat onto the trailer and return the boat/trailer to the locked storage unit and record truck mileage on the truck log
- ❑ Perform regular maintenance on the equipment (boats and trucks) as per Department of Parks and Recreation policies and protocols.

## C. Other Program Activities

### *Field Surveys*

Treatment crews implement pre- and post-season surveys to identify locations and coverage of water hyacinth and spongeplant and supplement these formal surveys with mid-season evaluations of water hyacinth and spongeplant coverage. Starting in February, and again in November, treatment crews conduct visual surveys of all treatment sites. For each site, crews record the extent of coverage (acres and percent coverage), and status of, water hyacinth and spongeplant at the site. Crews also identify the extent of *Egeria densa*, primrose and pennywort. Treatment crews record this information on the Weed Survey & Manual Removal Daily Log. A copy of this form is provided in **Appendix J**.

In the pre-season surveys, treatment crews identify problem areas such as those with the greatest impact on navigation, public safety, nursery areas, and sites close to pumps or other structures. Treatment crews also identify crops adjacent to treatment sites in order to help select the appropriate herbicides for treatment. During these pre-season field surveys, and in the first months of the treatment season, crews document the location and photograph sites with more than 100 square feet of re-growing water hyacinth and/or any spongeplant (seen as re-growing of wintering plants). Crews report these locations to the Field Supervisor and Environmental Scientist. After March 1 of each treatment season, these areas may be treated, depending on the location of the site and results of fish surveys. SCP hand removal with nets occurs throughout the year, as crews identify patches of spongeplant.

### *Herding*

Herding refers to the movement of water hyacinth and/or spongeplant mats by pushing or pulling mats from one location to another. Mats are moved to removal locations or into the main channel. Once in the main channel, the water hyacinth and spongeplant can flow out of the Delta, into saline waters and may die.

For herding water hyacinth and spongeplant out of the Delta, the Field Supervisor takes into account tides, storm events, and dam releases to select appropriate days and times for herding to take place. Crews will not herd in areas where physical damage to emergent, native vegetation is likely to occur such as among stands of cattails (*Typha* spp.), *Phragmites* spp., bulrushes (*Scirpus* spp.), or native cordgrass (*Spartina foliosa*). In addition, the total amount of herding in one area is limited to avoid impeding navigation. Crews may also push mats or sections of mats towards an excavator or similar equipment located on a boat ramp to support mechanical harvesting. This maximizes the amount of water hyacinth and spongeplant that can be removed by the equipment. Due to the current limited extent of the spongeplant invasion, timing, and logistical limitations of herding activities, this method will not be used as frequently as hand removal with nets.

### *Handpicking*

Handpicking of water hyacinth or spongeplant may be conducted primarily when or where chemical treatments cannot be made, and may occur throughout the year. As treatment crews survey for these species, they may conduct handpicking in selected areas if time allows. The goals of the handpicking aspect of the program are to aid in the control of floating weeds and reduce impacts of chemical application by clearing areas that are not accessible to chemical treatment, subject to high infestation, nurseries, and within emergent vegetation.

Treatment crews record location and water quality information, and quantity of plant removed, on the Weed Survey & Manual Removal Daily Log provided in **Appendix J**. Crews follow a handpicking protocol to ensure the protection of water quality and special status species, as follows:

- ❑ All plants collected by handpicking during the October 1 through May 1 season are disposed of at an approved disposal site to ensure no hibernating giant garter snakes are buried under piles of collected plants. The Field Supervisor consults with Environmental Scientists to identify approved disposal sites
- ❑ Consult electronic mapping to identify areas of giant garter snake habitat and presence of valley elderberry shrubs. Ensure that there are no special status plants (including valley elderberry shrubs) or animal species located within 100 feet of pre-approved disposal sites
- ❑ Collect plant fragments released during handpicking
- ❑ Operate vessels to minimize boat wakes and propeller wash. Avoid disturbing sediments in shallow waters when possible. Handpick in shallow water areas during high tide only, and glide boats into such areas and exit by pushing off from these areas with oars or poles whenever possible.

### *Hand Removal with Nets*

Hand removal of spongeplant or water hyacinth with nets (referred to as “hand removal”) utilizes pool skimmer type nets, and occurs throughout the year when, and where, chemical treatment cannot be made. As treatment crews survey for aquatic plants, they conduct hand

removal in selected areas. The goals of the hand removal aspect of the program are to aid in the control of aquatic weeds, reduce invasive plant growth among native plants, and reduce impacts of chemical treatment by clearing areas that are not accessible to chemical treatment, subject to high infestation, nurseries, and within emergent vegetation. Treatment crews will follow the four measures identified for handpicking when conducting hand removal of spongeplant or water hyacinth with nets.

### *Mechanical Removal*

DBW utilizes two different mechanical removal approaches. In the first approach, a small excavator and dump truck on a concrete boat ramp mechanically lift water hyacinth or spongeplant from the surrounding waterway. Crews support the excavation by herding the targeted weed that is outside of the excavator's reach closer to the equipment. This mechanical removal approach is used only in limited locations when aquatic weed growth is concentrated near a boat ramp.

In the second approach, mechanical equipment designed specifically to safely remove aquatic weeds from waterways utilizes cutters and conveyors to physically remove the plant from the water, and onto the bed of the equipment. The equipment collects and unloads vegetation using a conveyor system on a boom, adjustable to the appropriate cutting height (two to three feet below the surface). Cutter bars collect material and bring it aboard the vessel using the conveyor; and is offloaded to a dump truck when at capacity (between 2,000 and 15,000 pounds of plant material). The collected vegetation is disposed of at an authorized location, typically utilizing nearby farm fields.

Mechanical removal can be costly and will be used to supplement chemical treatment and/or when immediate removal of aquatic weeds is required. DBW will primarily utilize mechanical removal to remove dense mats of water hyacinth or spongeplant in locations where chemical treatment must be avoided, or when plants must be removed immediately.

# 4. Best Management Practices

This section of the OMP provides six Program Best Management Practices. These BMPs outline methods or techniques that have been found to be the most effective and a practical means of achieving a particular objective, and/or to comply with Program requirements.

## BMP #1 – Herbicide Handling Requirements

All personnel involved with the application of Program herbicides are trained in herbicide handling in accordance with Food and Agriculture Code and Title 3 Code of Regulations pertaining to Pesticides and Pest Control Operations.

### *Storage*

All Program herbicides shall be stored in a secured storage area in accordance with the California Food and Agriculture Code and Title 3 Code of Regulations. All herbicides obtained from the storage area will be recorded in the storage area logbook as well as in the individual treatment crew's daily log.

### *Transport*

Herbicides arrive by truck or boat to specific treatment sites on the day of treatment. Herbicides are transported in their original containers, securely fastened to the truck or boat, in a manner to prevent spillage. Spill kits and MSDS sheets are provided when traveling in any vehicle.

### *Mixing, Loading and Applications*

DBW staff shall use undiluted herbicides from containers; only the herbicide containers being applied are opened at the application site. All mixing, loading, and application operations are conducted in accordance with all label requirements and are performed with at least one licensed pesticide applicator present.

### *Disposal of Herbicide Containers*

Herbicide containers are triple rinsed and disposed of according to the herbicide label and applicable regulations.

## BMP #2 – Spray Equipment Calibration

Treatment crews should calibrate spray equipment used for the Program on at least a monthly basis during the treatment season. The equipment should be calibrated when a pump or herbicide is changed. The date of the last spray equipment calibration is recorded on the Daily Log under "Last Calibration."

DBW boats have a holding tank on the boat that is used to store Delta water. The boats use a multi-pump system. One pump draws water from the Delta into the holding tank. Another pump draws the aqueous chemical from the herbicide container. There are additional pumps for adjuvants and other additives.

A tube from each pump meets at the hose where the Delta water, herbicide, and other additives are blended. Orifices on the sprayer are adjusted to vary the application rate.

Treatment crews should calibrate the spray equipment so that it mixes the water from the Delta with the herbicide and other additives at the desired rates. Based on the PCRs, these concentrations are as follows:

- ❑ 2,4-D: 64 to 128 ounces Weedar 64 per acre
- ❑ Glyphosate: 120 ounces Roundup Custom per acre
- ❑ Penoxsulam: 2 to 5.6 ounces Galleon per acre
- ❑ Imazamox: 16 to 64 ounces Clearcast per acre
- ❑ Diquat: 16 to 64 ounces Reward per surface acre (*SCP only*).

A detailed description of the spray equipment calibration methodology is provided in **Appendix Q**.

## BMP #3 – Spill Avoidance and Contingency Plan

All herbicide spills are treated as emergencies. Concentrated herbicide spills are potentially more dangerous than herbicides diluted with water. All herbicide spills need to be treated seriously and immediately. While spills can occur during transporting, storing, or while using herbicides, DBW applies the following preventive measures to reduce the potential for a serious spill:

- ❑ For boats – herbicides are securely fastened in their original, watertight containers. Each boat shall carry a marker buoy with an attached anchor line which to mark any herbicide in the event of a spill
- ❑ For vehicles – herbicides will be transported in their original, watertight containers, in a manner that prevents spillage. MSDS and herbicide labels will be carried during transportation.

In addition, spray operators will carry a GPS device to reference/record location in the event of a spill.

### *Reporting Spills on Water*

The Aquatic Pest Control Specialist will have a cellular phone in his/her possession and the telephone numbers of the Department of Parks and Recreation Hazmat Coordinator, Environmental Program Manager, Environmental Scientist, and Field Supervisor. **Appendix F**, Medical and Emergency Contact Telephone Numbers, provides a list of emergency telephone numbers.

Herbicide spills will immediately be reported to the Department of Parks and Recreation Hazmat Coordinator, the Environmental Program Manager, the Environmental Scientist, and Field Supervisor.

In the event of a spill in water, the following procedures are employed:

- ❑ The location of the spill is be marked
- ❑ The amount of herbicide spilled is assessed.

The Specialist marks the spill location with a marker buoy and an approximate bearing with any permanent land markers. The Specialist takes a GPS reading and photographs of the spill. If deemed necessary, DBW monitors for herbicide residues and environmental impacts.

### *Reporting Spills on Land*

If a spill occurs on a public roadway, the Specialist immediately notifies the Department of Parks and Recreation Hazmat Coordinator, Environmental Program Manager, Environmental Scientist, and Field Supervisor.

In the event a spill occurs, it is of paramount importance that the discharge is stopped at its earliest source and that the spilled material be contained. DBW and contracted applicators have access to spill absorbent materials that can be applied for immediate containment of the spilled material. The following actions are taken as necessary to contain a spill on the ground:

- ❑ Stopping the spill at its source
- ❑ Contain the spill using dikes, as necessary
- ❑ Using spill absorbent materials, as appropriate.

Absorbent materials shall be placed in a sealable disposable container suitable for transporting. The container is labeled with its contents, including herbicide name and signal word. Dispose in accordance with the label and all applicable laws and regulations.

Document the spill and its clean-up with photos (if possible) and the date/time registered.

## BMP #4 – Annual Environmental Awareness Training

All Program personnel receive required Annual Environmental Awareness Training (as per the March 13, 2013 USFWS WHCP Biological Opinion 81410-2013- F-0005 and the USFWS SCP Biological Opinion (currently in the consultation process)). This training is provided by an USFWS approved biologist, typically one of the DBW environmental scientists. This training teaches treatment crews how to identify special status species and implement the endangered species avoidance measures and other environmental and water quality measures required of the WHCP. The training informs treatment crews and other program staff about the presence of delta smelt, giant garter snake, valley elderberry longhorn beetle, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon and their associated habitats, and that unlawful take of the animal or destruction of its habitat is a violation of the Endangered Species Act. The training includes instruction on:

- ❑ Species identification and adverse effect avoidance/minimization guidelines for delta smelt, giant garter snake, valley elderberry longhorn beetle, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and green sturgeon
- ❑ Life history of delta smelt, giant garter snake, valley elderberry longhorn beetle, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, and green sturgeon
- ❑ Protocol for identification and protection of delta smelt, giant garter snake, valley elderberry longhorn beetle, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, green sturgeon, and associated protected habitats
- ❑ The importance of delta smelt migratory routes, the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas to giant garter snake, the importance of elderberry shrubs as habitat for valley elderberry longhorn beetle

- ❑ Procedures for review of maps marking giant garter snake habitat and valley elderberry shrubs as part of Program treatment activities
- ❑ All terms and conditions of the USFWS Biological Opinion and NMFS letter of concurrence for the WHCP (and SCP) for protection, avoidance and minimization of adverse effects to protected species under the Act.

The environmental awareness training consists of two to three hours of training. The agenda for the environmental training is as follows:

1. Endangered Species Act
2. Threatened and Endangered Species
3. Avoidance and Minimization Measures
4. Environmental Considerations
5. What to do if There is Incidental Take.

Environmental compliance requirements for the WHCP are summarized in the WHCP Environmental Compliance Requirements Summary Document (April 22, 2013). SCP environmental compliance requirements will be specified when the SCP Biological Opinion is complete, and are likely to be similar. The treatment crews receive additional training each year based on the most recent version of this document. The agenda for this additional environmental training is as follows:

1. WHCP and SCP Objectives
2. What Guides WHCP and SCP Environmental Compliance
3. Role of Aquatic Pest Control Specialists and Aquatic Pest Control Technicians
4. Herbicide Application Practices
5. Timing and Location of Treatments
6. Avoidance Measures for Endangered Species
7. Training Requirements
8. Monitoring Requirements
9. Planning, Studies and Reporting
10. Other WHCP and SCP Environmental Compliance Requirements
11. Questions and Suggestions.

## BMP #5 – Endangered Species Avoidance Measures

The WHCP and SCP implement avoidance measures to reduce or eliminate potential impacts of the programs on endangered species. These measures are specified in the USFWS Biological Opinions and the NMFS letters of concurrence for the WHCP and SCP, and fall into three areas: timing and location of treatments, avoidance measures for endangered species, and mechanical treatment requirements.

## A. Timing and Location of Treatments

1. Avoid herbicide applications near special status species and their associated habitat, including sensitive riparian and wetland habitat and other biologically important resources
2. Conduct treatments according to the four areas defined in the USWFS WHCP BO (see Maps 3 and 4 in Appendix A)
   a. Area 1 treatments may begin June 1st
   b. Area 2, Area 3, and Area 4 treatments may begin March 1st, subject to the field and fish survey processes described in item #5
   c. Area 1 and Area 2 treatments may utilize 2,4-D and glyphosate, with the adjuvant Agridex
   d. Area 3 and Area 4 treatments may utilize 2,4-D, glyphosate, penoxsulam, and imazamox, with the adjuvants Agridex or Competitor
3. Conduct 2,4-D treatments according to the June 30, 2011 NMFS BO for the Environmental Protection Agency Registration of Pesticides
   e. 2,4-D may only be used in the legal Delta between June 15th and September 15th
   f. 2,4-D may only be used in all other treatment sites between July 15th and August 15th
4. Conduct 2,4-D treatments to reflect crop requirements
   g. 2,4-D may not be used north of Highway 12 (follow Sacramento CAC regulations)
   h. Follow Merced County CAC guidelines
5. Conduct treatments between March 1st and July 1st after consulting fish surveys to determine whether listed fish species are likely to be present, following the procedures below:
   1. For Areas 2, 3, and 4:
      a. Begin conducting regular field surveys in late-February to identify re-growing water hyacinth and spongeplant (see as re-greening of winter stunted plants). Focus on back-water and dead end locations and other nursery areas. Document the locations by photographing the sites with areas of more than 100 square feet of re-growing water hyacinth or spongeplant. These sites will be identified as potential treatment sites
      b. Each week, the Environmental Scientist will check the applicable State and federal fish survey data to determine whether listed fish species are likely to be near or in any of the potential treatment sites
      c. Between March 1st and July 1st, the Environmental Scientist will prepare a weekly summary list for USFWS and NMFS that identifies treatment sites where listed fish species are not likely to be present
   2. For Area 1, DBW will implement this same fish survey procedure during the month of June, focusing on NMFS listed species

6. Conduct diquat treatments (*SCP only*) in 2014 to 2017 only in emergency situations (such as spongeplant growth completely impeding navigation) and according to the USFWS SCP BO
   a. Treat no more than 50 acres using diquat per season (cumulative between SCP and EDCP)
   b. Utilize diquat only between August 1st and November 30th
   c. Review the latest CDFW fish survey information to determine the potential for occurrences of delta smelt nearest the proposed diquat treatment site
   d. Contact USFWS as soon as practicable about the diquat treatment plan before treatment is initiated
7. Report proposed treatment sites to USFWS and NMFS prior to the treatment week through the NOI and fish survey result reporting processes
8. Mechanical removal and herding will not take place in May and June, when listed fish species are most likely to be present in Delta waters.

## B. Avoidance Measures for Endangered Species

### *General Avoidance*

1. Provide treatment crews with electronic mapping that identifies previously surveyed and sensitive areas for giant garter snake habitat and locations of valley elderberry shrubs
2. Consult with the Environmental Scientist about upcoming treatments to determine whether presence of an endangered species in a planned treatment area will prevent a scheduled treatment
3. Prior to treating a site, perform a visual survey to determine whether special status plants, animals, or sensitive habitats are present. Complete the Environmental Observations Checklist. If any sensitive species are present at the site, the treatment crew should not perform the treatment
4. Avoid herbicide treatment near special status species, and sensitive riparian and wetland habitat; and other biologically important resources
5. Conduct herbicide treatments in order to minimize potential for drift; do not apply herbicides if winds are greater than 10 mph, or 7 mph in Contra Costa County
6. Operate program vessels in a manner that causes the least amount of disturbance to the habitat.

### *Listed Fish Species*

7. Implement the Fish Passage Protocol to provide a zone of passage through areas of low DO:
   a. In slow-moving and back-end sloughs with aquatic weed infestations, treat up to 30 percent of mat at one time. Treat mat in up to 3 acre strips, leaving at least 100 foot buffer strips between treated areas. Treat the untreated buffer strips and remaining 70 percent of the mat at least three more times following the initial treatment (in 30 percent increments). Conduct follow-up treatments in three week intervals.

b. In Delta tidal waters, treat up to 50 percent of the mat at one time. Treat mats in up to 3 acre strips, leaving at least 100 foot buffer strips between treated areas. Treat the untreated buffer strips and remaining 50 percent of the mat three weeks following the initial treatment for 2,4-D, 14 days following the initial treatment of diquat (*SCP only*), and one week following the initial treatment for other herbicides

c. In treatment sites where DO levels are at a level considered to be detrimental to fish species prior to treatment (below 3 mg/L), treat the entire area, without the 3 acre strips or buffer strips

8. Only use diquat from August 1 through November 30, limiting total treatment acres in the Delta to 50 treatment acres per year (cumulative between SCP and EDCP)
9. Do not initiate herbicide treatments if measured DO levels are between 3.0 mg/L and the basin plan limit for a particular site
10. If fish survey data shows that listed fish are not likely to be present at Delta sites, DBW may begin chemical treatments in those sites, following the herbicide use guidelines
11. If fish survey data shows that fish are likely to be present at Delta sites, DBW will not begin chemical treatments, but will continue to work with USFWS and NMFS to determine when listed fish are not present, and when treatment may begin.

### *Giant Garter Snake*

12. Avoid disturbance of upland giant garter snake habitat (through disposal of harvested water hyacinth and spongeplant, or land-based treatments) between May 1 and October 1
13. Dispose of all water hyacinth and spongeplant collected by handpicking and hand removal with nets outside of the May 1 to October 1 giant garter snake active season at an approved disposal facility to ensure no hibernating giant garter snakes are buried under piles of collected vegetation.

### *Valley Elderberry Longhorn Beetle*

14. Conduct all herbicide treatments downwind of elderberry shrubs and utilize a coarse droplet size to avoid the potential for drift
15. Maintain a 100 foot buffer between treatment sites and shoreline elderberry shrubs for most treatment sites
16. Maintain a 50 foot buffer between selected treatment sites and shoreline elderberry shrubs where the 100 foot buffer would preclude DBW's ability to treat water hyacinth and spongeplant (including sites: 10, 11, 46, 47, 48, 99, 234, 511, 529, 707, 708, and 710). Only treat sites using a 50 foot buffer when winds are less than 3 mph
17. Conduct pre- and post-treatment surveys of elderberry bushes on an annual basis. Compare the health of elderberry shrubs at control sites (not adjacent to treatment sites) with elderberry shrubs located adjacent to treatment sites. If elderberry shrubs adjacent to treatment sites show signs of adverse effects, develop additional mitigation measures to protect elderberry shrubs
18. Identify and utilize disposal areas (for handpicking and hand removal with nets) that are at least 100 feet away from elderberry shrubs (*Sambucus* ssp.).

### C. Mechanical Removal Requirements

1. Implement a protocol similar to that for chemical treatment prior to conducting mechanical removal. Environmental scientists check fish survey data to verify that listed fish species are not likely to be present at the removal site. The equipment operator utilizes the Environmental Checklist to evaluate presence of listed species or sensitive habitat prior to removal. If listed species or sensitive habitats are present, the operator will not conduct mechanical removal at that site
2. Conduct mechanical removal of water hyacinth or spongeplant in sensitive giant garter snake habitat or areas where giant garter snakes have been sighted in the past, only between October 1st and May 1st
3. Maintain a speed of 2 to 2.5 knots for the mechanical harvester in areas outside of sensitive giant garter snake habitat, or areas where giant garter snake has been sighted in the past, during the active season, so that if giant garter snake were in the area, they could move out of the way
4. Stop and reverse the mechanical harvester if a snake is seen within water hyacinth and/or spongeplant during removal
5. Dispose of all water hyacinth and spongeplant collected by mechanical removal outside of the May 1st to October 1st giant garter snake active season at an approved disposal facility to ensure no hibernating giant garter snakes are buried under piles of collected vegetation.

## BMP #6 – Agricultural and Water Intake Coordination

The Program implements specific measures to ensure that herbicide treatments do not negatively impact agricultural intakes and potable water intakes. The Program follows all herbicide label requirements as they relate to use of treated water for irrigation or drinking purposes.

When DBW needs to coordinate with a county water district, SWP, or CVP regarding water quality impacts, DBW will contact the agency to discuss a protocol for notification of treatment. Generally, DBW will notify an agency in advance of the proposed treatment. For potable water intakes, glyphosate will not be applied within 0.5 miles of an active potable water intake; or intakes must be turned off for a minimum of 48 hours after the treatment, or until glyphosate concentrations are less than 0.7 ppm.

For agricultural irrigation water intakes, the Program identifies and maps agricultural water intakes in each treatment site. The Program conducts surveys of crops adjacent to treatment sites, and identifies any potential incompatibilities with treatment herbicides, to avoid impacts to potentially sensitive crops.

## Appendix D

# Fish Passage Protocol

**California Department of Parks and Recreation**
**Division of Boating and Waterways**

# Fish Passage Protocol

**Original:** October 17, 2012 ● **Updated:** April 30, 2014

## Background

Invasive species are generally defined as non-indigenous species that adversely affect economics, environments, ecological relationships, and/or habitats where they have been introduced. The Delta is among the most invaded ecosystems worldwide, with over 200 invasive, non-native species. Invasive plants in the Delta include the water hyacinth, *Egeria densa*, and spongeplant.

The Division of Boating and Waterways (DBW) is designated as the lead agency of the state for the purpose of cooperating with agencies of the United States and other public agencies in controlling water hyacinth, *Egeria densa*, and spongeplant in the Sacramento-San Joaquin delta, its tributaries, and the Suisun marsh. DBW's aquatic weed program includes the Water Hyacinth Control Program (WHCP), *Egeria densa* Control Program (EDCP), and Spongeplant Control Program (SCP).

### Water Hyacinth

Water hyacinth (Eichhornia crassipes) is a non-native, free-floating aquatic macrophyte. Water hyacinth was first reported in California in 1904, and by the early 1980s this invasive weed had become a significant problem for agriculture, boating and recreation, and wildlife in the Sacramento-San Joaquin Delta (Delta) and its tributaries. Water hyacinth is characterized by showy lavender flowers and thick, highly glossy leaves up to ten inches across. The plant grows from 1 ½ to 5 feet in height, and the floating portion of the plant can grow to more than four feet in diameter. In the Delta, the plant is found in sloughs, connecting waterways, and tributary rivers. The growing season for water hyacinth in the Delta is typically from March to early December. Water hyacinth spreads and grows rapidly under favorable temperature and nutrient conditions such as those found in the Delta in the summer months, and mats may double in surface area in six to fifteen days.

SB 1344 (Garamendi, Chapter 263, Statutes of 1982) amended the California Harbors and Navigation Code to designate DBW as the lead agency for controlling water hyacinth in the Delta, its tributaries, and the Suisun Marsh. DBW developed an interagency task force to coordinate the control activities of federal, state, and local interests and to resolve problems and concerns associated with public health and safety, and environmental impacts. DBW initiated the WHCP in 1983. The WHCP's primary treatment method has been chemical, supported by hand-picking, herding and biological controls.

### *Egeria densa*

*Egeria densa* Planchon (Brazilian Elodea) is a submersed, non-native aquatic plant (submersed aquatic vegetation or SAV), introduced into the Delta approximately sixty years ago. This fast growing weed obstructs waterways, crowds out native plants, impedes anadromous fish migration and boat navigation, slows water flows, entraps sediments, and clogs agricultural and municipal water intakes. *Egeria densa* negatively impacts delta smelt by reducing turbidity and overwhelming littoral (near shore) habitats. *Egeria densa* infests almost twenty percent of the Delta's 61,619 surface acres, and is spreading at approximately 100 acres per year. Stems of *Egeria densa* are usually one to two feet long, but can be much shorter or longer, growing to over 9 feet long. The leaves are small and strap-shaped, typically about one-inch long and one-quarter inch wide. Flowers are on short stalks about one inch above the water, having white petals that are about ¾ inch across. *Egeria densa* reproduces asexually or vegetatively,

through fragmentation. Severed plant fragments regenerate into new plants capable of establishing themselves at new locations. Most of *Egeria densa*'s biomass is produced near the water surface.

AB 2193 (Rainey, Chapter 728, Statutes of 1996) authorized DBW to develop a control program for *Egeria densa*. DBW began treating *Egeria densa* in the Delta in 2001, in collaborations with the United States Department of Agriculture, Agricultural Research Service (USDA-ARS), after completing an Environmental Impact Report (EIR) and obtaining the required National Pollutant Discharge Elimination System (NPDES) permit and National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) biological opinions. The EDCP's primary treatment method has been chemical, supported by diver assisted handpicking, diver-operated suction harvesting and benthic barriers.

## Spongeplant

South American spongeplant (*Limnobium laevigatum*) is a non-native, prolific, floating, flowering plant in the "frogbit" family (Hydrocharitacaea). Spongeplant was first seen in California in 1996, and was discovered in the San Joaquin River in 2007. In 2013, spongeplant was identified in twenty locations within the Delta. Spongeplant is a floating aquatic plant that grows in dense floating mats or rooted in mud or wetland edges. Spongeplant consists of leafy rosettes in a complex branching system. Leaves have pads of aerenchyma (spongy air spaces) on the undersides that provides buoyancy. Leaves are generally one to three inches across. Mature plants may be 8 to 12 inches in height. Spongeplant reproduces both vegetatively and through seed production (abundant seed pods and seedlings), with flowing and seed production appearing heaviest during the warmer temperatures in May and June. In 2013, most mats in the Delta were small (less than 30 feet), and many were inter-mixed with other aquatic plants (mixed in, and under, other plants).

AB 1540 (Buchanan, Chapter 188, Statutes of 2012) was approved by the Legislature on August 15, 2012, and was signed by the Governor on August 27, 2012. AB 1540 added responsibility for an additional invasive plant to DBW and USDA-ARS' existing programs (i.e., WHCP and EDCP). The SCP is a new program to address the infestation of spongeplant, with treatments started in 2013. The SCP's primary treatment method is chemical, supported by hand removal with nets, herding and mechanical removal.

## Program Operations

Current DBW aquatic weed control program herbicides include 2,4-Dichlorophenoxyacetic acid, dimethlyamine salt (2,4-D), glyphosate, fluridone, penoxsulam, imazamox and diquat. Chemical treatment is typically conducted with hand-held sprayers (liquid chemical treatment for floating weeds), injection spray equipment (liquid chemical treatment typically for submerged weed), or broadcast spreaders (pellet treatment), from aluminum air or outboard motor boats. The boats are equipped for direct metering of herbicides, adjuvants, and water into pump delivery systems. Trained field crews spray the chemical mixture directly onto the plants for the WHCP and SCP. For the EDCP, field crews injection spray, or most commonly broadcast spread, herbicide pellets. DBW's aquatic weed control programs are intended to support beneficial uses under the Clean Water Act, and there have been no known measurable water quality or environmental degradation effects, including no known impacts to fish.

DBW and cooperating counties halted the WHCP in 2000 after a legal action from the *Delta Keepers* claimed that DBW must obtain a NPDES permit from the Central Valley Regional Water Quality Control Board (CVRWQCB) under the 9$^{th}$ Circuit Court's Headwaters Inc. v. Talent Irrigation District decision. DBW applied for the newly required NPDES permit in January 2000, and the CVRWQCB developed permit conditions in October 2000, but did not issue a permit. In March 2001, the State Water Board issued DBW a NPDES permit for the WHCP, incorporating most of the conditions

developed by the CVRWQCB. One of the conditions of WHCP's NPDES permit required DBW to develop a protocol to be followed to ensure that the WHCP operations provided a zone of passage to fish at all times. The original WHCP Fish Passage Protocol was developed in 2001 and implemented by the WHCP ever since. The original protocol was incorporated into the 2009 WHCP Programmatic Environmental Impact Report (PEIR), and had been a component of WHCP operations since 2001.

Conditions and requirements have changed since the 2001 Fish Passage Protocol was developed. In March 2006, the CVRWQCB issued a NPDES General Permit for Aquatic Weed Control, replacing the prior NPDES permit. DBW's aquatic weed control programs have been following the NPDES General Permit requirements since 2006. The State Water Resources Control Board (SWRCB) adopted the current NPDES General Permit for Aquatic Weed Control on March 5, 2013, effective December 2013 through November 2018. The current NPDES permit, as with the prior NPDES permits, does not require a fish passage protocol.

Since 2001, DBW has also received biological opinions (or letters of concurrence) for its programs. Conditions required by USFWS and NMFS promote fish passage in Delta waters. DBW environmental monitoring since 2001 has not found negative impacts to fish, or low dissolved oxygen levels that might impede fish passage. DBW is adding more reduced risk new herbicides (penoxsulam and imazamox), as evidence of their adaptive management program approach. Furthermore, herbicide labels for the two original WHCP herbicides (2,4-D and glyphosate) are now less restrictive in regards to measures to avoid dissolved oxygen impacts.

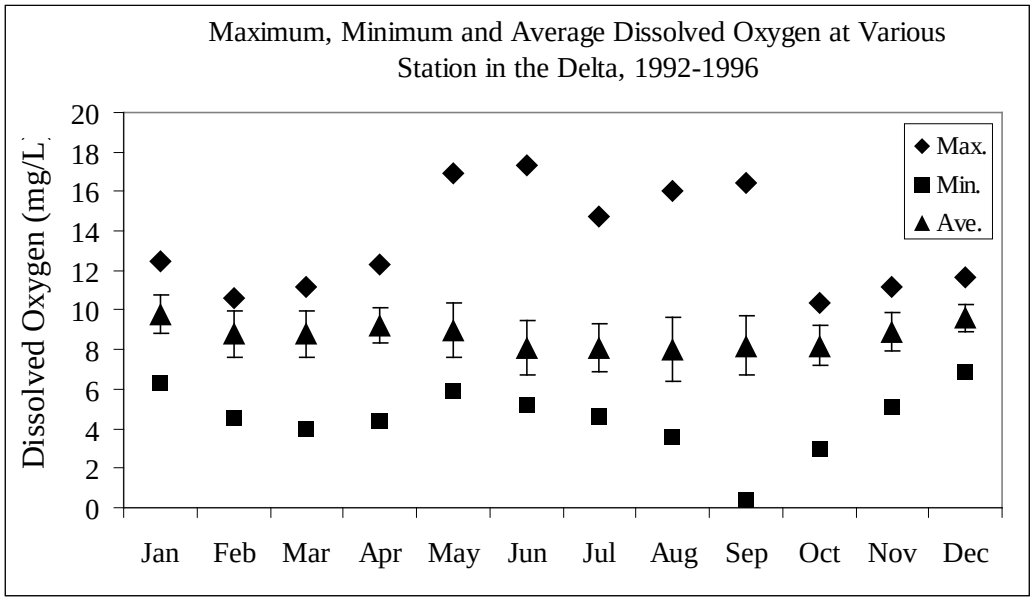
As a result of these significant changes, DBW and USDA-ARS have revised the fish passage protocol. A formal fish passage protocol is not required by the NPDES permit. However, DBW and USDA-ARS will implement this new fish passage protocol as a best practice to reduce the potential for negative effects on listed fish species movement near water hyacinth, *Egeria densa* and spongeplant treatment sites.

The impacts of aquatic weeds on dissolved oxygen can be complex. Water hyacinth mats tend to have lower dissolved oxygen (DO) levels than do open waters around the mats. Spongeplant is smaller than water hyacinth but has many similar characteristics. Thus, we can reasonably predict that findings for water hyacinth would apply to spongeplant. *Egeria densa*'s impact on DO levels are more complex, with higher DO levels during the day (oxygenation from photosynthesis), and lower DO levels at night and early morning (respiration). DO impacts tend to be notably significant with water hyacinth. There is also quantitative information and scientific literature more readily available for DO levels associated with water hyacinth. The following information is directly related to water hyacinth, though can broadly be applied to *Egeria densa* and spongeplant.

## Dissolved Oxygen and Water Hyacinth

DO is the content of oxygen found in water. DO is determined by temperature, weather, water flow, nutrient levels, algae, and aquatic plants. Generally, a higher level of DO is beneficial to fish. Fish begin to experience oxygen stress or exhibit avoidance at levels below 5 mg/liter. Salmonids have been reported to actively avoid areas with low dissolved oxygen concentrations (Davis 1975 in Carter 2005). Fish will migrate to areas with higher DO levels. A 1990 study found that brookling trout moved away from water with DO concentrations of 1 to 1.9 mg/L within one hour, moved away from water with DO concentrations of 2 to 2.9 mg/L within one to two hours, and moved away more slowly from water with concentrations of 3 to 3.9 mg/L (Carter 2005). Juvenile Chinook salmon avoided DO concentrations of 1.5, 3.0, and 4.5 mg/L (Carter 2005). Salmonids are also likely to avoid water hyacinth mats in slow-moving waters and shorelines. In a fish migration study in Washington State, juvenile coho salmon, steelhead, and cutthroat trout were all found to use the faster-moving and deeper water sections of the waterway (Zydlewski et al. 2002).

**Exhibit 1.**




DO levels drop in warmer temperatures, and increase with precipitation, wind, and water flow. Running water, such as the tidal water in the Delta, dissolves more oxygen than still water. Diurnal tidal movement also mixes lower DO water that might be present under a growing or decaying water hyacinth mat with incoming, higher DO, water. High levels of nutrients in water reduce DO levels, while algae and aquatic plants can increase DO through photosynthesis, but decrease DO through respiration and decomposition. DO levels fluctuate throughout the day, and are typically lowest in the morning and peak in the afternoon. In deep, still waters, DO levels are lower in the hypolimnion (bottom layer of water) because there is little opportunity for oxygen replenishment from the atmosphere. As illustrated in **Exhibit 1,** above, DO levels measured at various locations in the Delta averaged between 8 and 9.8 mg/L.

Treatment of aquatic weeds with certain herbicides can result in a faster than natural decaying of plant biomass that may create a large biological oxygen demand, resulting in decreases in dissolved oxygen. DBW recognizes that decaying water hyacinth has the potential to temporarily reduce DO levels. The problem of low DO following herbicide treatment of water hyacinth is a concern when the herbicide is relatively fast-acting, such as 2,4-D, imazapyr, and to a lesser extent glyphosate. The labels for these three herbicides include recommendations to reduce the potential for DO impacts. Diquat is also relatively fast-acting (which may be used for *Egeria densa* and spongeplant treatments), and its label also includes recommendations to reduce potential for DO impacts.

The low DO following herbicide treatment may be amplified by the fact that DO levels under large water hyacinth mats can already be low. DBW conducts DO monitoring, as described in this document, to evaluate DO impacts following treatment. A further uncertainty as to the extent of potential low DO impacts on fish is that few native fish are found in water hyacinth mats (Hanni 2005). **Table 1,** on the following page, summarizes the herbicide label requirements regarding dissolved oxygen effects and timing of follow-up treatments, should they be required. Note that the follow-up treatment timing refers to treating previously treated plants a second (or more) time, not treating previously untreated plants in the same site. These requirements help to avoid negative impacts to fish resulting from decaying weeds.

**Table 1**
**Summary of Herbicide Label Requirements Related to Dissolved Oxygen and Repeat Treatments (Current as of April 2014)**

| Herbicide | Aquatic Weed Program | Dissolved Oxygen Requirements | Number of Treatments | Time Between Treatments |
|---|---|---|---|---|
| 2,4-D | WHCP, SCP | It may be appropriate to treat only part of the infestation at one time. For example, apply the product in lanes separated by untreated strips that can be treated after the vegetation in treated lanes has disintegrated (2-3 weeks in growing season). Begin treatment along the shore and move outward in bands to allow fish to move into untreated areas. | Two applications per season | 21 days between applications |
| Glyphosate | WHCP, SCP | When infestations require treatment of the total surface area of impounded water*, treating the area in strips may avoid oxygen depletion due to decaying vegetation. | May require retreatment | 24 hours between applications |
| Penoxsulam | WHCP, EDCP, SCP | None | Not specified | Not specified |
| Imazamox | WHCP, EDCP, SCP | None | Up to 4 applications per season at 32 ounces per acre application rate | Not specified |
| Fluridone | EDCP | None | Not specified | Not specified |
| Diquat | EDCP, SCP | Treat no more than one-third to one-half of a water body at one time, waiting 14 days for follow-up treatment of the remaining area. Do not initiate treatment if measured DO levels are between 3.0 mg/L and 5.0 mg/L. | Not specified | 14 days between treatments |

* The WHCP, EDCP and SCP project areas encompass tidal and riverine waters, not impounded waters.

Existing DO levels in large water hyacinth mats are often already low, particularly in slower-moving waters and dead-end sloughs. Thus, with adequate avoidance measures, further decreases in dissolved oxygen that would impede fish passage can be avoided and/or minimized. Large patches of water hyacinth can cause low dissolved oxygen levels (Toft 2000). Data summarized below indicate that DO levels under water hyacinth mats are lower than DO levels elsewhere in the Delta. Toft found average spot DO measurements below 5 mg/L for water hyacinth and above 5 mg/L for pennywort (Toft 2000). In a similar study of DO in aquatic weeds in Texas, water hyacinth was found to have the lowest DO levels as compared to milfoil, hydrilla, pondweed, and a mix of native species, and was the only plant to have DO levels below 5 mg/L (Madsen 1997 in Toft).

Research in the Delta conducted by USDA-ARS measured DO levels every half-hour under a large mat of water hyacinth that completely covered a 15-meter wide slough on the Cosumnes River Nature Preserve. The slough was subject to tidal flows. Over a four-day period in June 1996, DO levels each day ranged from 0 mg/L to just over 5 mg/L. Only about 5 of 200 data points measured under the mat were above 5 mg/L, and the vast majority of the data points were between 2 mg/L to

4 mg/L (Spencer 2001). The results of the DO testing are shown in **Exhibit 2,** starting on the following page. These data indicate that large infestations of water hyacinth across waterways, such as those that have occurred on the Merced and San Joaquin Rivers prior to treatment, are likely to impede the passage of fish.

## Results of WHCP Dissolved Oxygen Monitoring

DBW and USDA-ARS track two sets of DO monitoring. At every herbicide application, treatment crews take DO samples immediately prior to treating, and approximately one-hour post-treatment. These levels would be expected to be similar, as they occur a few hours apart and the potential for lowering DO due to decaying water hyacinth would not occur immediately post-treatment. Data from Daily Treatment Logs support that there is no significant impact on DO immediately post-treatment. Of 719 treatments occurring between 2007 and 2011, there were 13 cases with no change in DO, 404 cases with an increase in DO (average increase of 0.8 mg/L), and 302 cases with an average decrease in DO (average decrease of 0.6 mg/L). The average pre-treatment DO was 7.9 mg/L, and the average post-treatment DO was 8.1 mg/L. The minimum allowable DO in most of the WHCP program area is 5.0 mg/L. Both pre- and post-treatment levels are well above the 5.0 mg/L considered safe for fish.

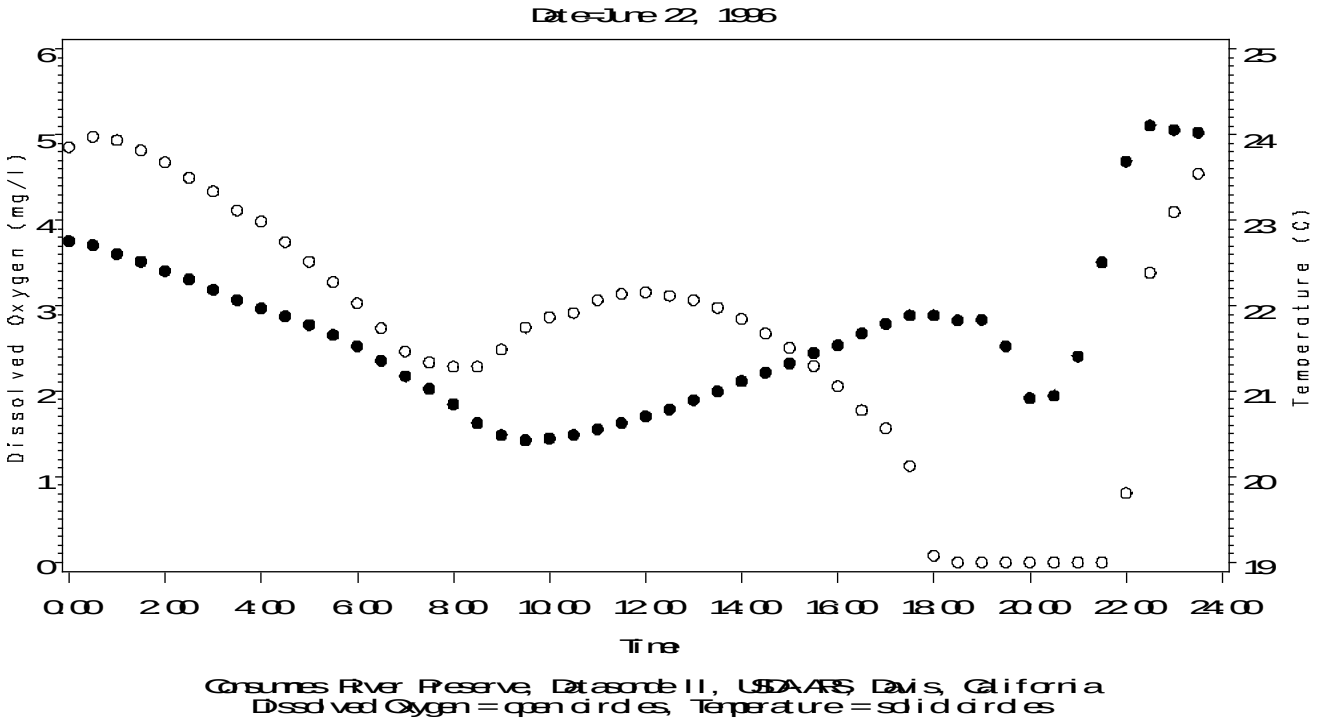
The DO monitoring that occurs with follow-up water quality sampling would be more likely to show potential decreases in DO, as post-treatment sampling occurs several days after treatment, when plant death symptoms are starting to occur. However, representative DO monitoring data from 2011 shows that herbicide treatments do not significantly impact DO. The data in **Table 2**, on page 9, provide 2011 treatment and post-treatment DO levels taken at the time of water quality sampling, on the day of treatment, and between four and seven days post-treatment. In five cases, DO levels increased. Note that the most significant increase occurred at Site 16, where existing DO was at an extremely low 2.06 mg/L prior to treatment (a level resulting in stress and avoidance for fish), and DO increased by six days post-treatment to 7.03 mg/L, a level safe for fish. In the other instance of extremely low DO prior to treatment at site 301, DO increased from 1.07 mg/L to 2.71 mg/L by five days post-treatment. In these two critical cases where DO levels prior to treatment were below levels safe for fish, DO levels improved following WHCP treatments. The average decrease in DO among the six 2011 monitoring sites with decreased DO was 0.79 mg/L, and in all cases where DO decreased, it was still well above the Basin Plan minimum of 5.0 mg/L. DBW and USDA-ARS will continue to monitor pre- and post-treatment DO levels in each of its aquatic weed programs (i.e., WHCP, EDCP and SCP).

In 2013, DBW conducted a pilot study for DO monitoring to assess impacts of water hyacinth and herbicide treatments on DO. DO levels were measured continuously under a water hyacinth mat located along Middle River at Union Point. Data revealed greater fluctuations of DO underneath water hyacinth compared to adjacent open water. Within the water hyacinth, the lowest and highest DO concentrations were 1.43 mg/L and 11.76 mg/L, respectively. Whereas, DO ranged from 6.12 mg/L to 9.79 mg/L in open water. Diel changes in DO were observed, with low DO levels occurring at night or early morning and highest concentration occurring in the afternoon.

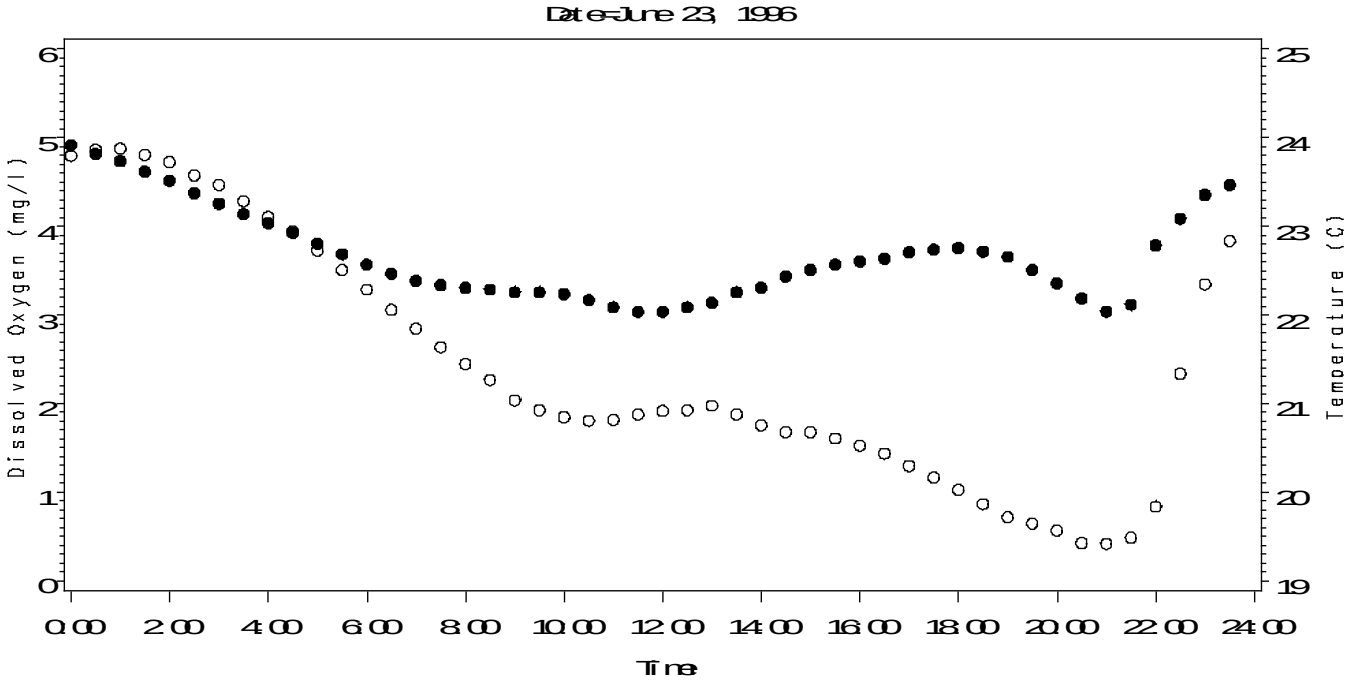
* * * * *

If reductions in dissolved oxygen do occur, these decreases in DO resulting from treatment of aquatic weeds are likely to be short-term since the Delta is a flowing, rather than a standing, water system. One of the long-term benefits of treating with herbicides is a reduction in the volume of invasive aquatic weeds in the Delta. Removing large patches of aquatic weeds will allow DO levels to increase, thus enhancing the ability of fish to move unimpeded in Delta waters. It can be argued that such a benefit outweighs the impact of potential short-term localized decreases in dissolved oxygen following treatment.

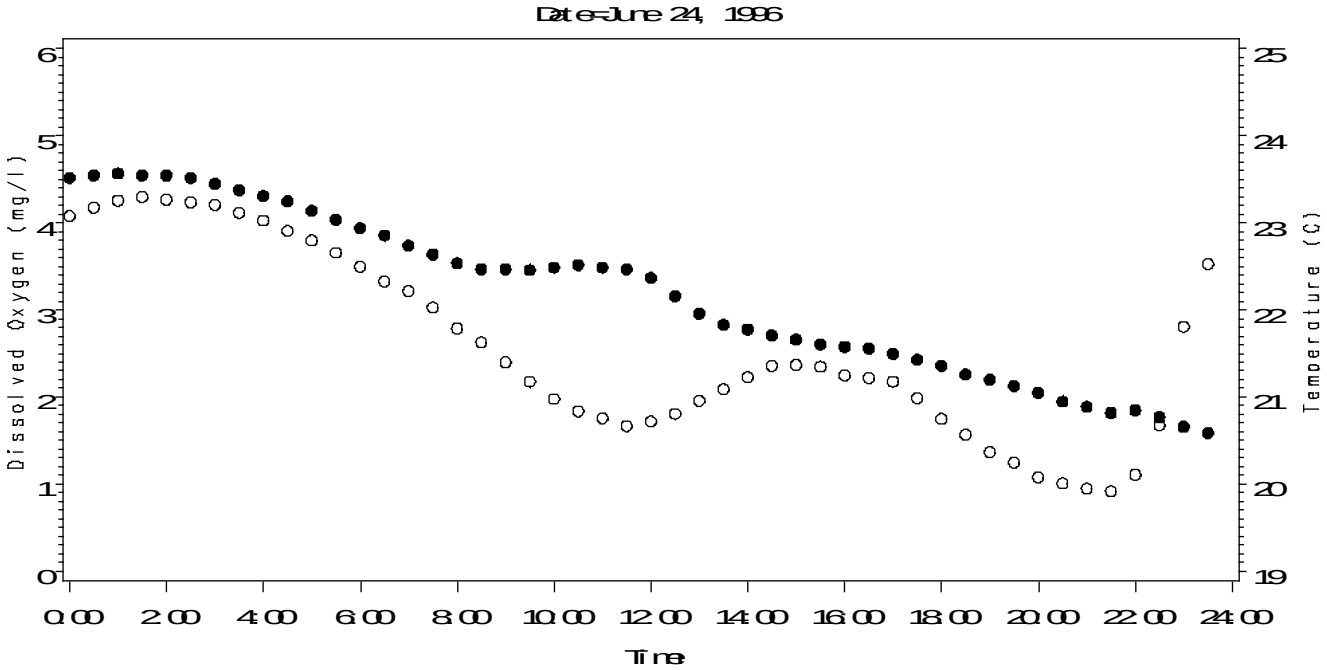
**Exhibit 2.** Four graphs depicting datasonde results under a dense mat of water hyacinth plants in a slough on the Cosumnes River Nature Preserve.




Consumnes River Preserve, Datasonde II, USDA-ARS, Davis, California
Dissolved Oxygen = open circles, Temperature = solid circles




Consumnes River Preserve, Datasonde II, USDA-ARS, Davis, California
Dissolved Oxygen = open circles, Temperature = solid circles


Date=June 24, 1996
Dissolved Oxygen (mg/l)
Temperature (C)
Time
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
Consumnes River Preserve, Datasonde II, USDA-ARS, Davis, California
Dissolved Oxygen = open circles, Temperature = solid circles

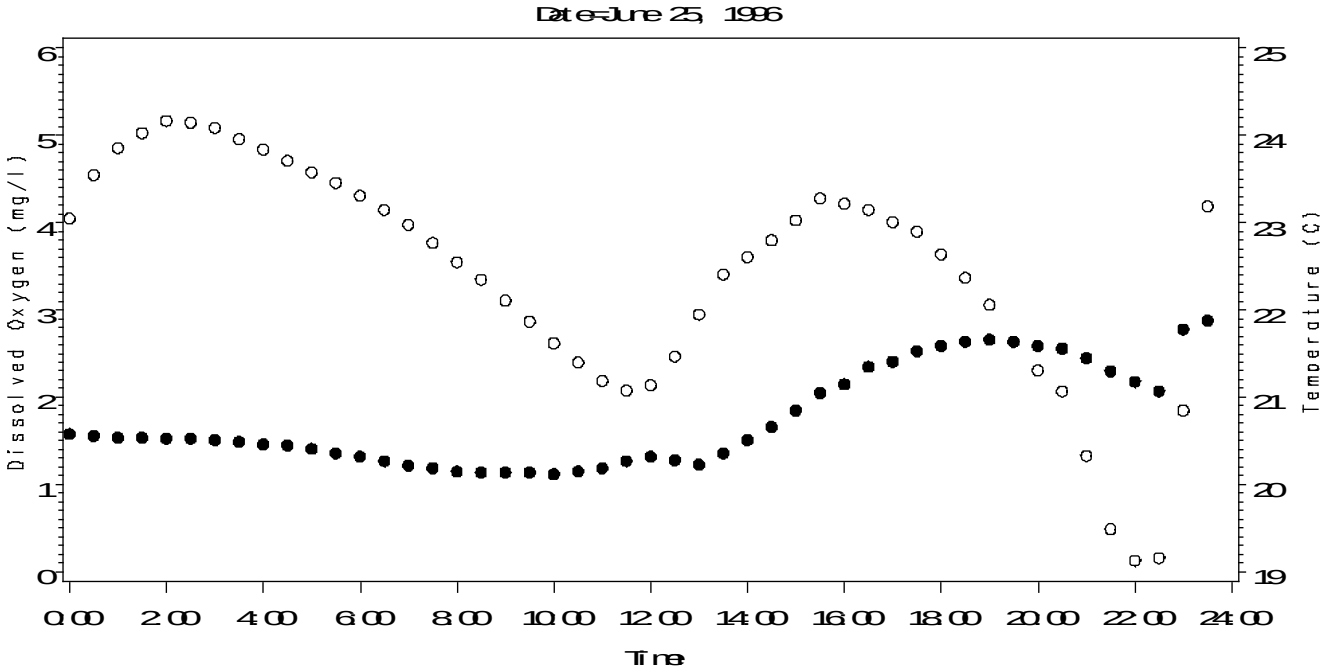

Date=June 25, 1996
Dissolved Oxygen (mg/l)
Temperature (C)
Time
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
24:00
Consumnes River Preserve, Datasonde II, USDA-ARS, Davis, California
Dissolved Oxygen = open circles, Temperature = solid circles

**Table 2**
**Comparison of Treatment and Post-Treatment Dissolved Oxygen Levels (in mg/L) (2011)**

| Site | Days Post Treatment | Treatment DO | Post-Treat DO | Difference (Post-Treatment) |
|---|---|---|---|---|
| **2,4-D Treatments** | | | | |
| 13 | 6 | 7.18 | 7.09 | (0.09) |
| 14 | 5 | 8.46 | 7.23 | (1.23) |
| 15 | 6 | 7.74 | 7.73 | (0.01) |
| 16* | 6 | 2.06 | 7.03 | 4.97 |
| 58 | 6 | 7.06 | 7.15 | 0.09 |
| 59 | 4 | 6.92 | 6.98 | 0.06 |
| 68 | 6 | 7.86 | 7.97 | 0.11 |
| **Glyphosate Treatments** | | | | |
| 216 | 7 | 9.80 | 8.40 | (1.40) |
| 217 | 7 | 7.70 | 6.18 | (1.52) |
| 300 | 5 | 8.50 | 8.00 | (0.50) |
| 301* | 5 | 1.07 | 2.71 | 1.64 |
| Average increase for five increased DO sites: | | | | 1.37 |
| Average decrease for six decreased DO sites: | | | | (0.79) |

* Highlighted rows had DO levels harmful to fish prior to WHCP treatments.

## Fish Passage Protocol

There is very little quantitative information and/or scientific literature upon which to base treatment acreage limitations for a fish passage protocol, and even less information specific to the Delta environment. The previous 3 acre limitation was originally put forward by a member of the Water Hyacinth Task Force in the early 1980s as a precautionary limit to address potential for reductions in water quality beneficial uses. At the time the 3 acres was proposed, water hyacinth treatments started earlier in the season, before mats grew to the large acreage (sometimes over 50 acres) that can occur in today's Delta environment. Based on data summarized in this document, these large mats likely have a greater detrimental impact on dissolved oxygen than herbicide treatments.

The protocol below is based on combined recommendations of an aquatic weed expert, an herbicide company representative, the Pacific Northwest Weed Management Handbook, Washington State NPDES requirements, herbicide label requirements, Delta water conditions, prior dissolved oxygen monitoring data, the prior 3 acre limit, and literature on salmonid migration. The intent is to provide a fish passage protocol with numerical treatment limits that provide conservative fish protection, reflect actual Delta conditions, take into account the variability in treatment site size (6.5 acres to 1,707 acres) and consider field operation constraints. DBW will follow this protocol for <u>all</u> water hyacinth treatments, <u>all</u> spongeplant treatments, and <u>only</u> *Egeria densa* treatments using diquat.

1. In slow-moving and back-end sloughs with aquatic weed infestations, DBW will treat up to 30 percent of the mat at one time. Mats will be treated in up to 3 acre strips, leaving at least 100 foot buffer strips between treated areas. The untreated buffer strips and remaining

70 percent of the mat will be treated at least three more times following the initial treatment (in 30 percent increments). These follow-up treatments will take place at three week intervals.

2. In Delta tidal waters, DBW will treat up to 50 percent of the mat at one time. Mats will be treated in up to 3 acre strips, leaving at least 100 foot buffer strips between treated areas. The untreated buffer strips and remaining 50 percent of the mat will be treated three weeks following the initial treatment for 2,4-D treatments, 14 days for following initial treatment for diquat, and one week following initial treatment for other herbicides.
3. If DO levels in an area to be treated are at a level considered to be detrimental to fish species prior to treatment (below 3 mg/liter), DBW may treat the entire area (without the 3 acre strips or buffer strips), therefore allowing the DO levels to increase to beneficial use levels once the aquatic weed is controlled.
4. For each treatment site and herbicide application, DBW staff shall follow herbicide label requirements, as specified, to reduce the potential for low dissolved oxygen. Current requirements for DBW's aquatic weed program herbicides are provided in Table 1.
5. When follow-up herbicide applications of previously treated plants are required, DBW staff shall follow herbicide label requirements, as specified, regarding the number of treatments and time between treatments.

On the following page, and in **Exhibit 3,** starting on page 13, we provide examples of the fish passage protocol in regards to water hyacinth. The large numerals in Exhibit 3 refer to the treatment number.

20 acre water hyacinth mat in a dead end slough site:

Treatment 1: 30% = 6 acres
Protocol – spray two strips of 3 acres each with 100 feet between strips

Treatment 2: 30% = 6 acres
Protocol – spray two strips of just under 3 acres each with 100 feet between strips, plus the previously untreated strip

Treatment 3: 30% = 6 acres
Protocol – spray two strips of just under 3 acres each with 100 feet between strips, plus the previously untreated strip

Treatment 4: 10% = 2+ acres
Protocol – spray the remaining 2+ acres, plus the previously untreated strip.

20 acre water hyacinth mat in a tidal site:

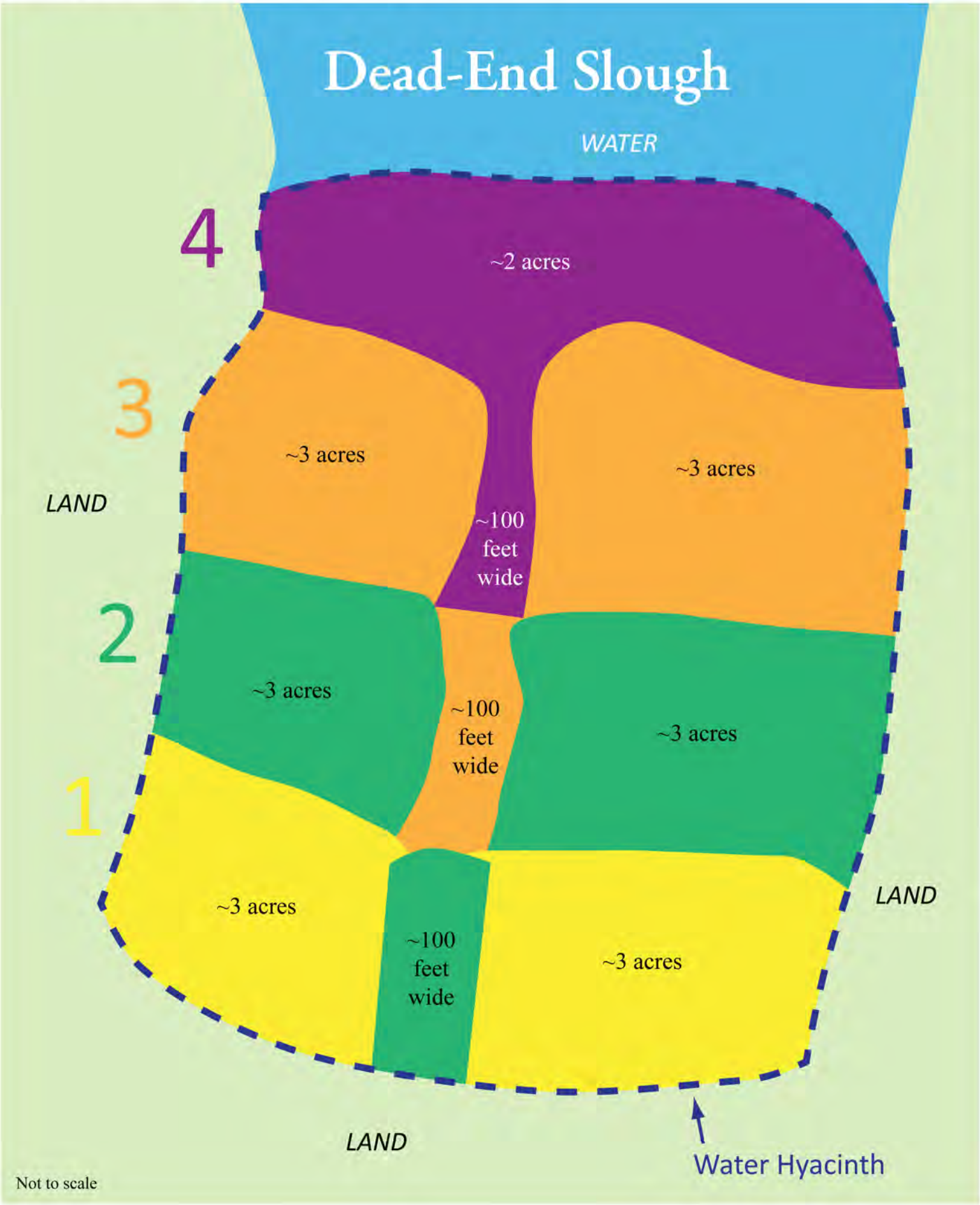
Treatment 1: 50% = 10 acres
Protocol – spray three strips of 3 acres plus one strip of 1 acre with 100 feet between strips, or treat four 4 strips of 2.5 acres with 100 feet between strips

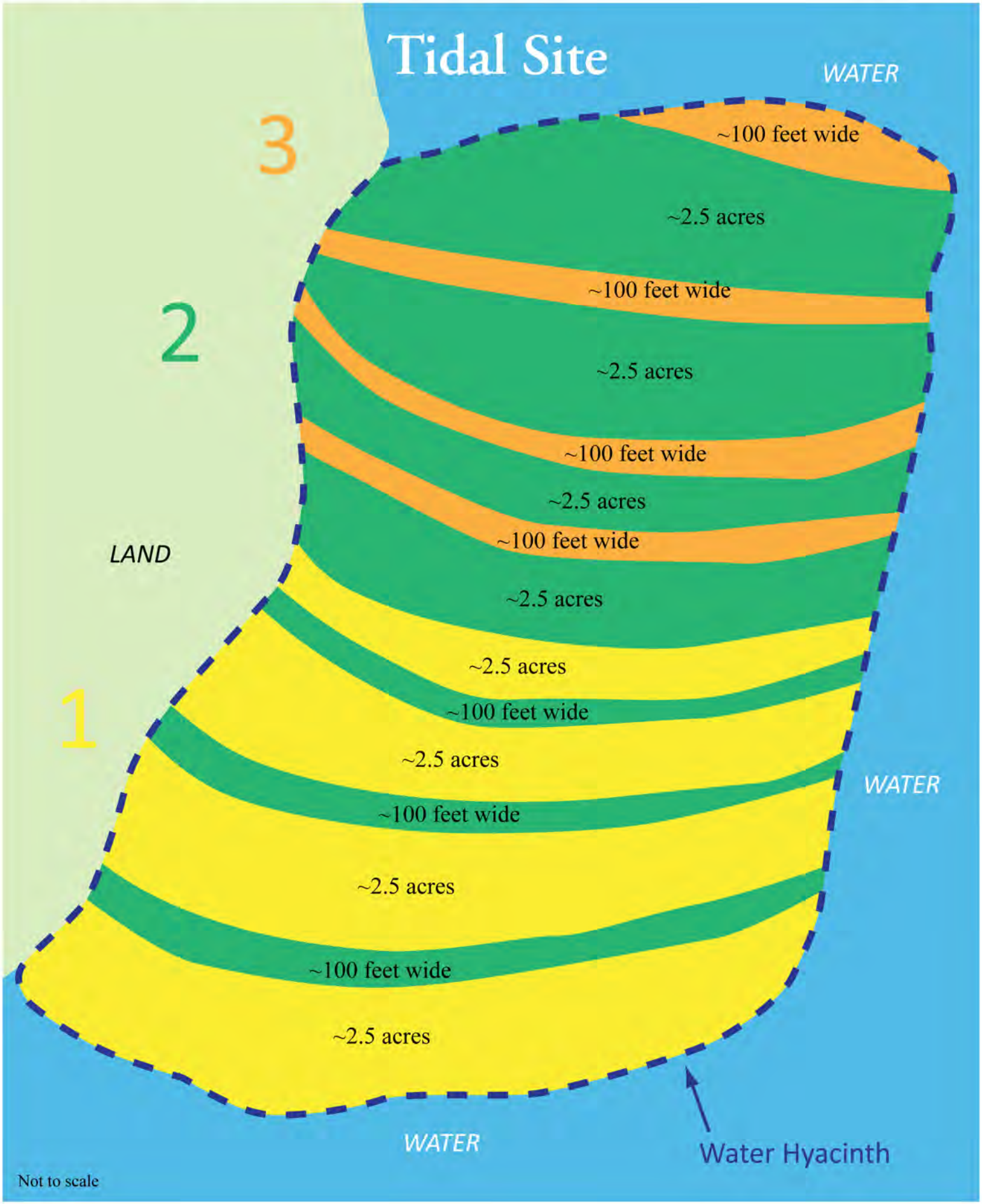
Treatment 2: 50% = 10 acres
Protocol – spray three strips of just under 3 acres plus one strip of 1 acre with 100 feet between strips, or treat four 4 strips of just under 2.5 acres with 100 feet between strips, plus previously untreated strips

Treatment 3: untreated strips
Protocol – spray remaining untreated strips from Treatment 2.

**Exhibit 3**
**Example Fish Passage Protocol for 20 Acres of Water Hyacinth**






Tidal Site
WATER
3
~100 feet wide
~2.5 acres
~100 feet wide
2
~2.5 acres
~100 feet wide
~2.5 acres
~100 feet wide
LAND
~2.5 acres
~2.5 acres
~100 feet wide
1
~2.5 acres
WATER
~100 feet wide
~2.5 acres
~100 feet wide
~2.5 acres
WATER
Water Hyacinth
Not to scale

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## Appendix E

# SCP Environmental Checklist

# Appendix E
# SCP Environmental Checklist

This appendix provides a summary of SCP mitigation measures and checklists of SCP activities to be conducted by DBW in order to maintain compliance with the PEIR mitigation measures; WHCP/SCP Operations Management Plan (OMP); USFWS biological opinion, NMFS letter of concurrence, and NPDES permit. **Exhibit E-1,** starting on the next page, provides mitigation measures by responsible party and time period. Following Exhibit E-1, there are two separate checklists, one for environmental program manager/ field supervisor/environmental scientists (**Exhibit E-2**), and one for the treatment crew (**Exhibit E-3**). Each checklist is divided chronologically into (1) Planning/Pre-Season; (2) In-Season; and (3) Post-Season.

**Exhibit E-1**
**SCP Mitigation Measures by Responsible Party and Time Period**

*Page 1 of 2*

| | Environmental Program Manager/Field Supervisor/ Environmental Scientist Activities | Treatment Crew Activities |
|---|---|---|
| | 1. Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources (environmental awareness training) | 1. Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources (environmental awareness training) |
| Planning/ Pre-Season | 8. Implement an adaptive management approach to minimize the use of herbicides | 17. Require treatment crews to participate in training on herbicide and heat hazards |
| | 9. Provide treatment crews with electronic mapping that identifies previously surveyed areas for giant garter snake habitat | |
| | 17. Require treatment crews to participate in training on herbicide and heat hazards | |
| In-Season | 4. Conduct herbicide treatments using diquat only in emergency situations and for no more than 50 acres in total among DBW aquatic weed control programs | 1. Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources |
| | 5. Operate program vessels in a manner that causes the least amount of disturbance to the habitat | 2. Provide a 100 foot buffer between treatment sites and shoreline elderberry shrubs (*Sambucus* ssp.), host plant for the valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)* (reduced to 50 feet in some instances) |
| | 6. Implement temporal and spatial limitations and restrictions on herbicide treatments to minimize treatments during times, and at locations, where larval and/or migratory fish are likely to be present | 3. Conduct herbicide treatments in order to minimize potential for drift |
| | 7. Monitor herbicide and adjuvant levels to ensure that the SCP does not result in potentially toxic concentrations of chemicals in Delta waters | 4. Conduct herbicide treatments using diquat only in emergency situations and for no more than 50 acres in total among DBW aquatic weed control programs |
| | 8. Implement an adaptive management approach to minimize the use of herbicides | 5. Operate program vessels in a manner that causes the least amount of disturbance to the habitat |
| | 9. Provide treatment crews with electronic mapping that identifies previously surveyed areas for giant garter snake habitat and valley elderberry shrub locations | 10. Monitor dissolved oxygen levels pre- and post-treatment for all SCP treatments |
| | 12. Follow environmental compliance measures for species avoidance, equipment operation, and disposal when conducting mechanical harvesting operations | 11. Implement the Fish Passage Protocol to provide a zone of passage through areas of low dissolved oxygen |

**Exhibit E-1**
**SCP Mitigation Measures by Responsible Party and Time Period** *(continued)* *Page 2 of 2*

| | Environmental Program Manager/Field Supervisor/ Environmental Scientist Activities | Treatment Crew Activities |
|---|---|---|
| In-Season *(continued)* | 14. Identify and utilize disposal areas that have no and/or low habitat value for the federal and State listed giant garter snake *(Thamnophis gigas)* | 12. Follow environmental compliance measures for species avoidance, equipment operation, and disposal when conducting mechanical harvesting operations |
| | 15. Identify and utilize disposal areas that are at least 100 feet away from elderberry shrubs (*Sambucus* ssp.) | 13. Collect plant fragments during and immediately following treatment |
| | 19. Implement safety precautions on hot days to prevent heat illness | 14. Identify and utilize disposal areas that have no and/or low habitat value for the federal and State listed giant garter snake *(Thamnophis gigas)* |
| | 20. Follow the protocol for herbicide applications within one (1) mile of drinking water intake facilities | 15. Identify and utilize disposal areas that are at least 100 feet away from elderberry shrubs (*Sambucus* ssp.) |
| | 21. Notify County Agricultural Commissioners about SCP activities | 16. Minimize public exposure to herbicide treated water |
| | | 18. Follow best management practices to minimize the risk of spill and to minimize the impact of a spill, should one occur |
| | | 19. Implement safety precautions on hot days to prevent heat illness |
| | | 20. Follow the protocol for herbicide applications within one (1) mile of drinking water intake facilities |
| Post-Season | 7. Implement an adaptive management approach to minimize the use of herbicides | |

**Exhibit E-2**
**Checklist #1 – Environmental Program Manager/Field Supervisor/ Environmental Scientist Activities**



## Checklist #1 – Environmental Program Manager/Field Supervisor/Environmental Scientist Activities

### *Planning/Pre-Season*

- ☐ 1. Obtain and update records for crew Qualified Applicator Certificates (QAC) and continuing education.
- ☐ 2. Ensure that the SCP is utilizing the most recent herbicide labels and MSDS, and provide training to crews on reading, understanding, and following herbicide label requirements.
- ☐ 3. Prepare and conduct environmental awareness training for treatment crews.
- ☐ 4. Prepare and conduct training on use of field equipment for treatment crews.
- ☐ 5. Require treatment crews to participate in training on herbicide and heat hazards.
- ☐ 6. Provide treatment crews with electronic mapping that identifies previously surveyed areas for giant garter snake habitat and valley elderberry shrubs.
- ☐ 7. Conduct herbicide handling training for the field staff, in accordance with Title 3, Food and Agriculture, Division 6 of the California Code of Regulations, "Pesticides and Pest Control Operations."
- ☐ 8. Prepare Pest Control Recommendations (PCR) for all application areas. The PCR must be prepared by a licensed Pest Control Advisor (PCA), and submitted to the County Agricultural Commissioner (CAC) offices.
- ☐ 9. Obtain a Restricted Use Permit (RUP) from CAC offices, if necessary. Communicate RUP provisions to application crews.
- ☐ 10. Prepare a prioritized list of treatment sites based on current field observations, prior infestation history, and staff knowledge.
- ☐ 11. Develop a plan and tentative schedule for water sampling required to fulfill USFWS, NMFS, and NPDES permit requirements.
- ☐ 12. Prepare and distribute a public notice identifying potential treatment locations and herbicides two weeks prior to the first herbicide treatments.
- ☐ 13. Implement an adaptive management approach to minimize the use of herbicides.

### *In-Season*

- ☐ 1. Prepare and submit Notices of Intent (NOI) for each week, and submit to the appropriate County Agricultural Commissioner (CAC) and field offices; notify County Agricultural Commissioners about SCP activities.
- ☐ 2. Update the prioritized list of treatment sites based on new information, as appropriate.
- ☐ 3. Review fish survey data to determine whether listed fish species are likely to be present in treatment sites. Provide weekly notification of survey results and treatment sites to USFWS, NMFS, and CDFW between March 1st and July 1st.
- ☐ 4. Follow the protocol for herbicide applications within one mile of drinking water intake facilities.
- ☐ 5. Monitor herbicide and adjuvant levels to ensure that the SCP does not result in potentially toxic concentrations of chemicals in Delta waters.

**Exhibit E-2**
**Checklist #1 – Environmental Program Manager/Field Supervisor/ Environmental Scientist Activities** *(continued)*

*Page 2 of 2*

| *In-Season (continued)* |
|---|
| ☐ 6. Coordinate with treatment crews and conduct water sampling, as required, throughout the season. |
| ☐ 7. Notify application crews one week in advance of a planned treatment when conducting water sampling at that planned treatment. |
| ☐ 8. Conduct a survey of elderberry shrubs at the beginning and end of the treatment season to compare the health of elderberry shrubs at control and treatment sites. |
| ☐ 9. Cancel applications when wind and/or weather could be a factor in worker safety, and/or compromise the effectiveness of an application. |
| ☐ 10. Enter and review Daily Log information on at least a weekly basis. |
| ☐ 11. Prepare a Pesticide Use Report to the appropriate CACs each month. |
| ☐ 12. Implement safety precautions on hot days to prevent heat illness. |
| ☐ 13. Implement an adaptive management approach to minimize the use of herbicides. |

| *Post-Season* |
|---|
| ☐ 1. Prepare a combined Water Hyacinth Control Program/Spongeplant Control Program Annual Report, including information required for USFWS, NMFS, and NPDES permits. |
| ☐ 2. Update WHCP/SCP Operations Management Plan, as needed. |
| ☐ 3. Implement an adaptive management approach to minimize the use of herbicides. |

**Exhibit E-3**
**Checklist #2 – Treatment Crew Activities**



## Checklist #2 – Treatment Crew Activities

### *Planning/Pre-Season*

- ☐ 1. At least one member of all two-person crews (the Aquatic Pest Control Specialist) must obtain a Qualified Applicators Certificate (QAC) from the California Department of Pesticide Regulation (DPR). Aquatic Pest Control Technicians are encouraged to work toward obtaining a QAC.
- ☐ 2. Read, understand, and be able to follow herbicide label requirements.
- ☐ 3. Participate in environmental awareness training, and in particular become familiar with avoidance measures for delta smelt, longfin smelt, Chinook salmon, Central Valley steelhead, green sturgeon, giant garter snake, valley elderberry, and nesting birds.
- ☐ 4. Participate in herbicide handling training.
- ☐ 5. Participate in equipment training.
- ☐ 6. Participate in training on herbicides and heat hazards.
- ☐ 7. Conduct field surveys to provide information on current field conditions (i.e. level and location of spongeplant infestations).
- ☐ 8. Conduct hand removal of spongeplant with pool-skimmer nets.

### *In-Season*

GENERAL ACTIVITIES

- ☐ 1. Make all herbicide applications according to herbicide label specifications and California Code of Regulation requirements.
- ☐ 2. Follow environmental protocols required by the USFWS Biological Opinion, NMFS Letter of Concurrence, and NPDES General Permit.
- ☐ 3. Follow all requirements for herbicide storage, transport, mixing, loading applications, and container disposal, as specified in Best Management Practice (BMP) # 1, Herbicide Handling Requirements.
- ☐ 4. Conduct spray equipment maintenance and calibration on at least a monthly basis, as specified in BMP #2, Spray Equipment Calibration.
- ☐ 5. Follow BMP #3, Spill Avoidance and Contingency Plan, in the event of an aquatic or terrestrial spill; follow best management practices to minimize the risk of spill and to minimize the impact of a spill, should one occur.
- ☐ 6. Conduct field surveys to provide information on current field conditions (i.e. level and location of spongeplant infestations and locations of drinking water intakes).
- ☐ 7. Conduct hand removal of spongeplant with pool-skimmer nets.
- ☐ 8. Consult with the Environmental Scientist about upcoming applications to determine whether presence of an endangered or special status species in a planned treatment area will prevent a scheduled application.
- ☐ 9. Provide a 100 foot buffer between a treatment site and shoreline elderberry bushes (reduced to 50 feet in some areas and when wind is less than 3mph).
- ☐ 10. Utilize the Giant Garter Snake Habitat Evaluation Maps and visually check for giant garter snakes when launching a boat from an unimproved location on a levy.
- ☐ 11. Minimize public exposure to herbicide treated water.
- ☐ 12. Implement safety precautions on hot days to prevent heat illness.

**Exhibit E-3**
**Checklist #2 – Treatment Crew Activities** *(continued)*

*Page 2 of 2*

### *In-Season (continued)*

TREATMENT DAY ACTIVITIES

- ☐ 13. Understand and follow the PCR and label requirements before making any herbicide applications.
- ☐ 14. Check that all required equipment is in the boat prior to leaving the dock or storage bay.
- ☐ 15. Record the appropriate pre-treatment information on the Daily Log, after boating to the treatment site.
- ☐ 16. Perform a visual survey for species of concern and complete the Environmental Observations Checklist. If any sensitive species are present at the site, the application crew should not perform the treatment.
- ☐ 17. Avoid herbicide application near special status species, and sensitive riparian and wetland habitat; and other biologically important resources.
- ☐ 18. Utilize the dissolved oxygen monitor/meter, wind meter, and GPS to take the appropriate measures (water temperature, DO level, time, location, equipment calibration date, wind speed) and record in the Daily Log.
- ☐ 19. If the wind speed is greater than 10mph, or 7mph in Contra Costa County, do not perform the treatment at that particular site.
- ☐ 20. Complete electronic data collection in the handheld computer and determine whether the application meets the applicable NPDES permit conditions for treatment.
- ☐ 21. Monitor dissolved oxygen levels pre- and post-treatment for all SCP treatments.
- ☐ 22. Do not conduct the treatment if the dissolved oxygen level is between 3.0 mg/l and the basin plan limit for that location, based on the dissolved oxygen maps.
- ☐ 23. Follow the fish passage protocol to provide a zone of passage through areas of low dissolved oxygen.
- ☐ 24. Conduct herbicide treatments in order to minimize potential for drift.
- ☐ 25. Operate program vessels in a manner that causes the least amount of disturbance to the habitat.
- ☐ 26. Collect plant fragments during and immediately following treatments.
- ☐ 27. Identify and utilize disposal areas that have no and/or low habitat value for the federal and State listed giant garter snake (*Thamnophis gigas*).
- ☐ 28. Identify and utilize disposal areas that are at least 100 feet away from elderberry shrubs (*Sambucus* ssp.)
- ☐ 29. Record the appropriate post-treatment information in the Daily Log, and submit to DBW Headquarters staff.

### *Post-Season*

- ☐ 1. Conduct field surveys to provide information on current field conditions (i.e. level and location of spongeplant infestations and locations of drinking water intakes).
- ☐ 2. Conduct equipment maintenance activities.

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## Appendix F

# SCP Maps

# Appendix F
# SCP Maps

The following pages contain full-sized fold-out versions of the maps found within the body of Volume I of the SCP Programmatic Environmental Impact Report.

- SCP Potential Treatment Sites
- SCP Project Area Map – Northern Sites and Southern Sites
- Valley Elderberry Shrub Locations and Giant Garter Snake Habitat Valuation – Northern and Southern Sites
- SCP Dissolved Oxygen Limits – Northern Sites and Southern Sites.

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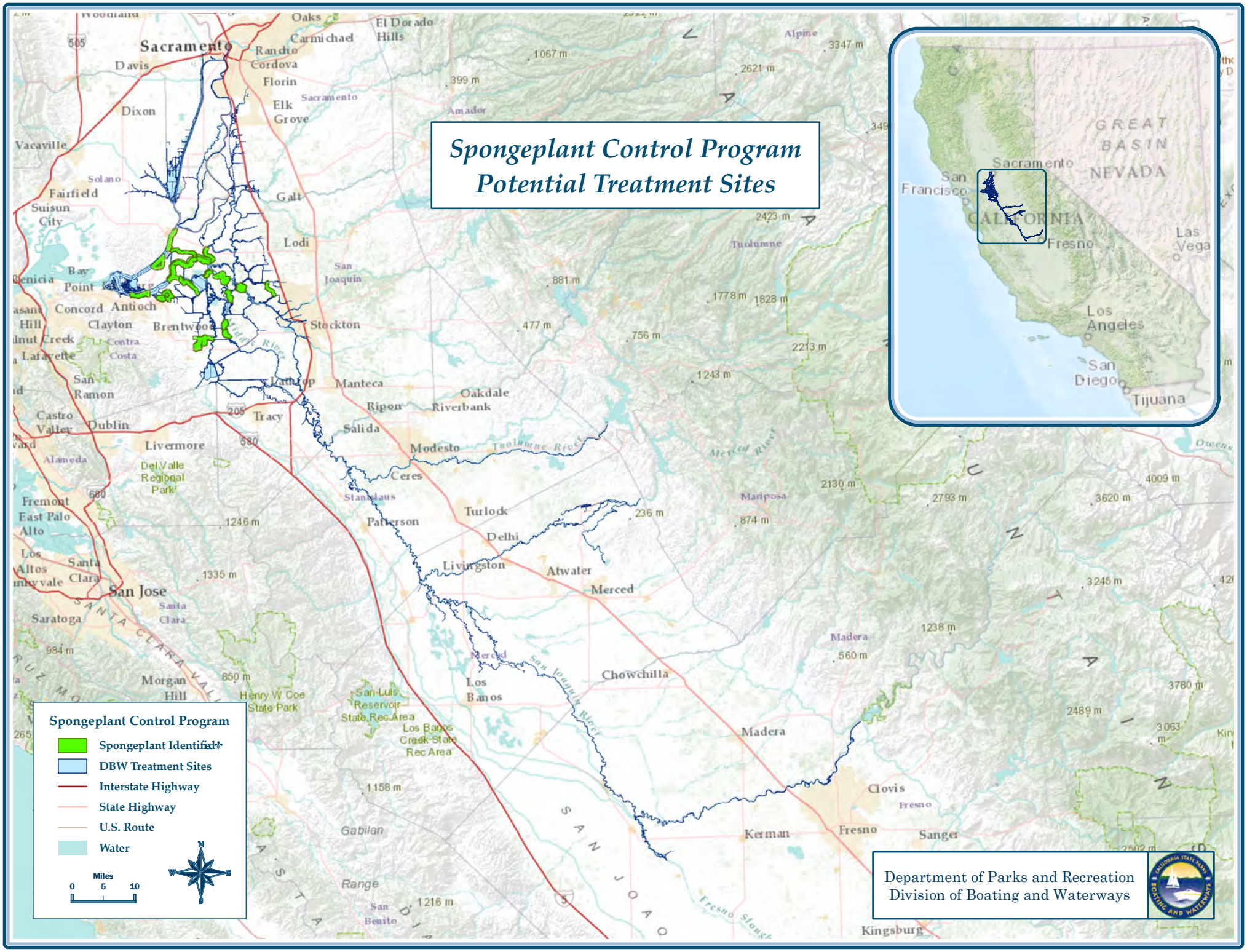
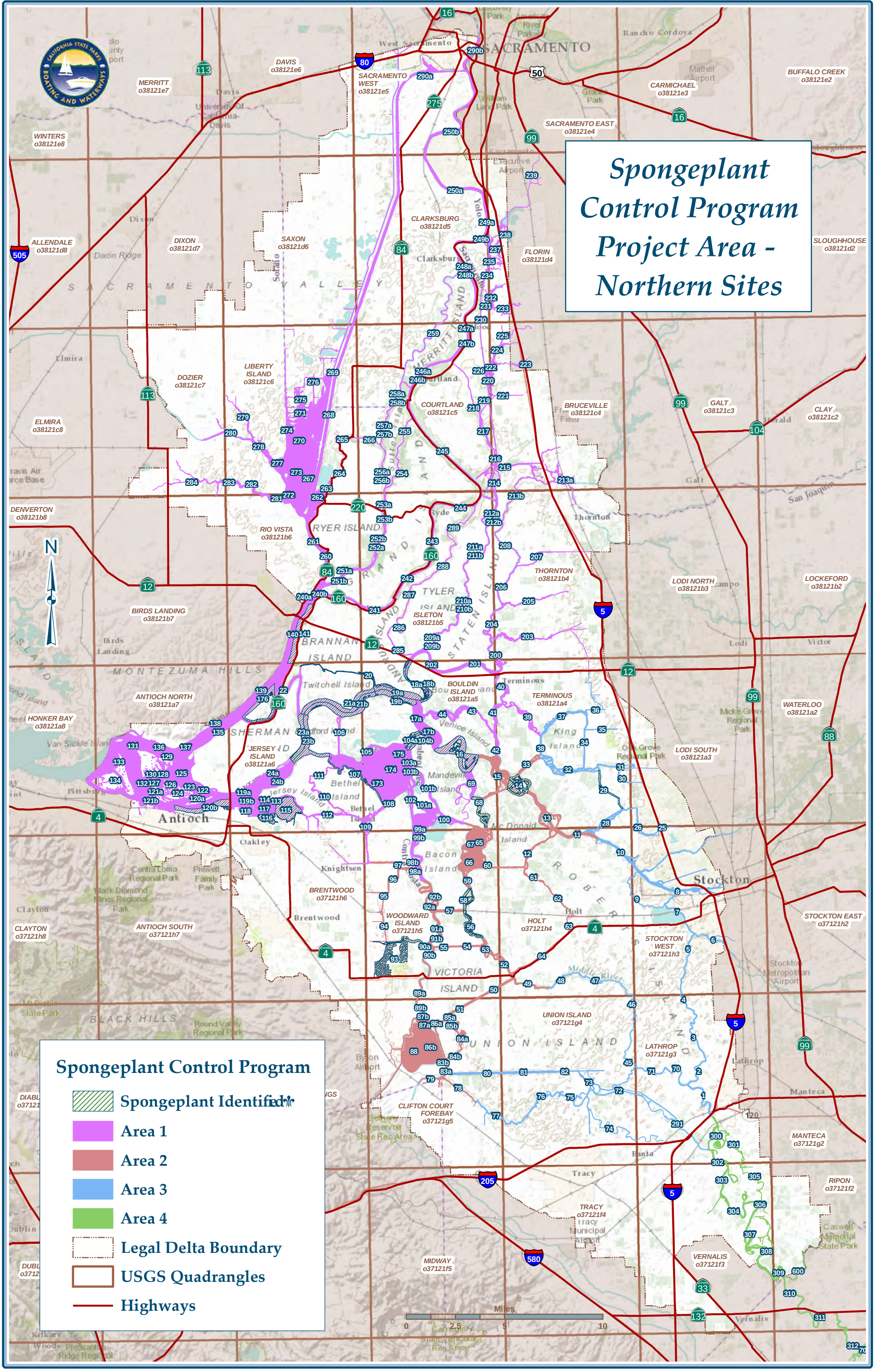
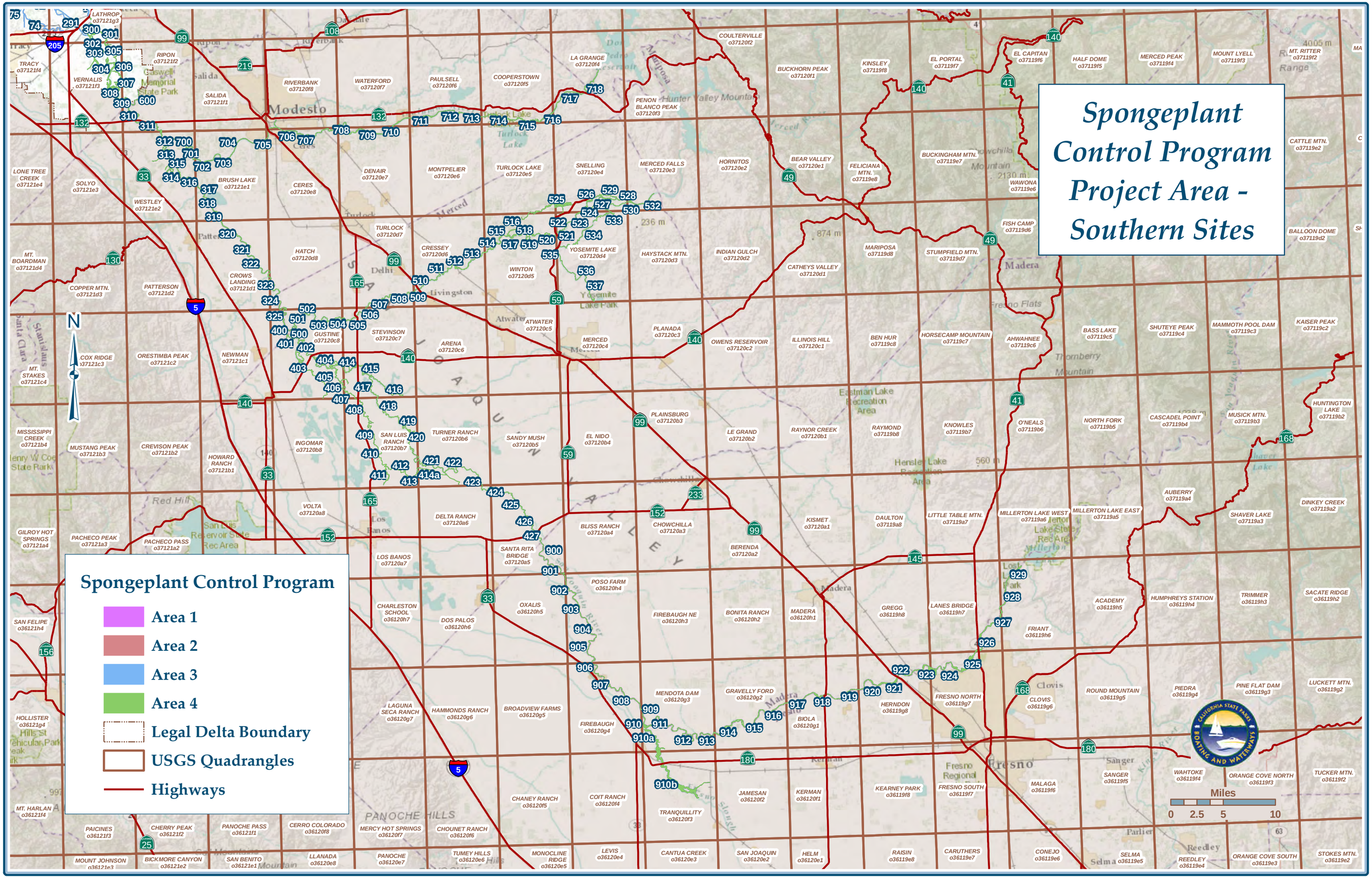
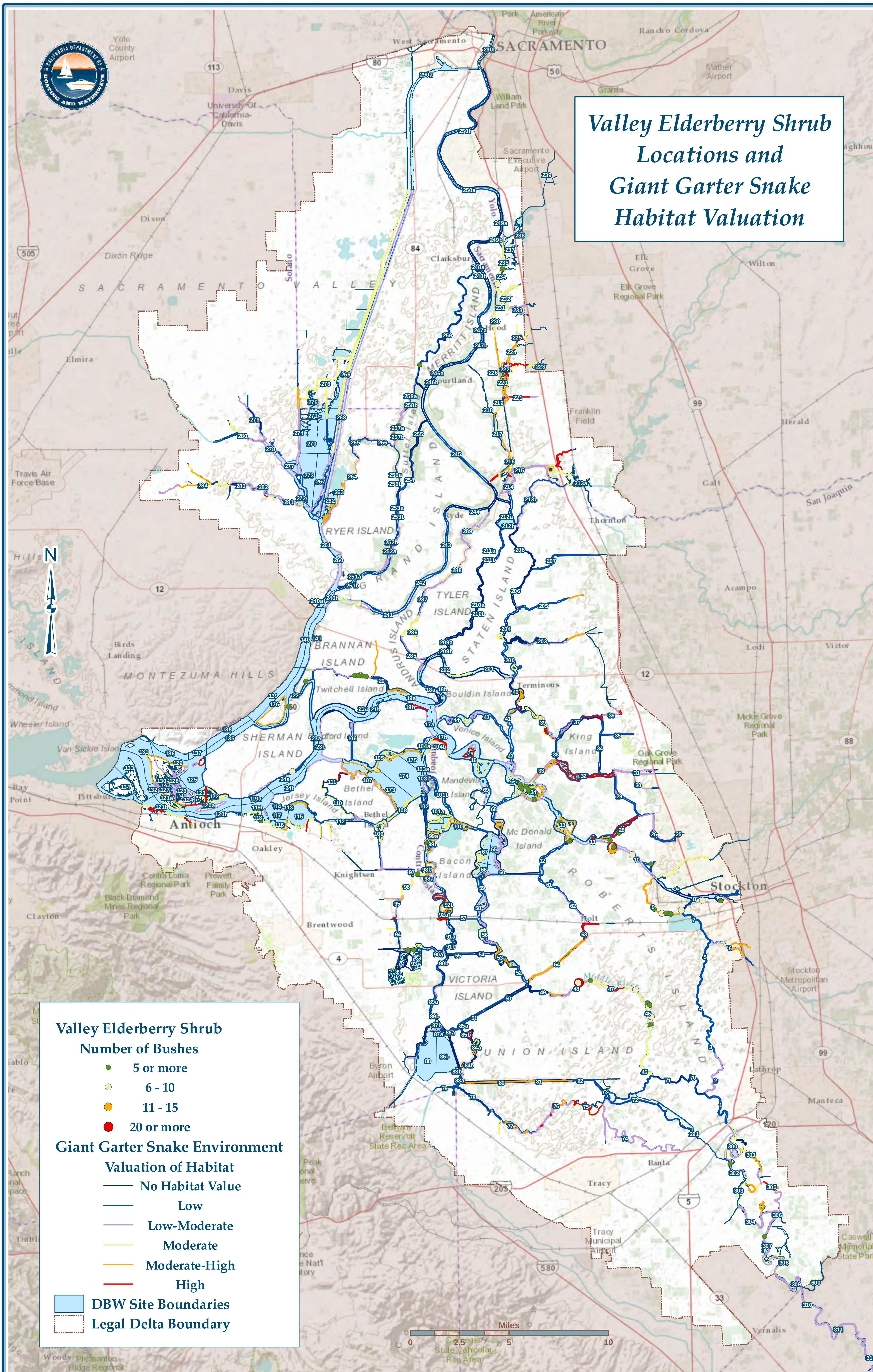

Spongeplant Control Program
Potential Treatment Sites
Spongeplant Control Program
Spongeplant Identified*
DBW Treatment Sites
Interstate Highway
State Highway
U.S. Route
Water
Miles
0 5 10
Department of Parks and Recreation
Division of Boating and Waterways
Sacramento
Davis
Dixon
Vacaville
Fairfield
Suisun City
Vallejo
Benicia
Bay Point
Concord
Antioch
Clayton
Brentwood
Walnut Creek
Lafayette
San Ramon
Castro Valley
Dublin
Livermore
Alameda
Fremont
East Palo Alto
Los Altos
Santa Clara
San Jose
Saratoga
Morgan Hill
Oakland
Oakley
Galt
Lodi
Stockton
Lathrop
Manteca
Tracy
Ripon
Riverbank
Oakdale
Salida
Modesto
Ceres
Stanislaus
Turlock
Patterson
Delhi
Livingston
Atwater
Merced
Los Banos
Chowchilla
Madera
Clovis
Fresno
Kerman
Sanger
Kingsburg
Gabilan
Range
San Benito
Carmichael
Rancho Cordova
Florin
Elk Grove
El Dorado Hills
Alpine
Amador
Tuolumne
Mariposa
Madera
Fresno
Solano
Contra Costa
Del Valle Regional Park
Henry W Coe State Park
San Luis Reservoir State Rec Area
Los Banos Creek State Rec Area
Merced
San Joaquin
Tuolumne River
Merced River
Fresno Slough
SANTA CLARA VALLEY
SAN JOAQUIN
GREAT BASIN
NEVADA
CALIFORNIA
Sacramento
San Francisco
Fresno
Las Vegas
Los Angeles
San Diego
Tijuana

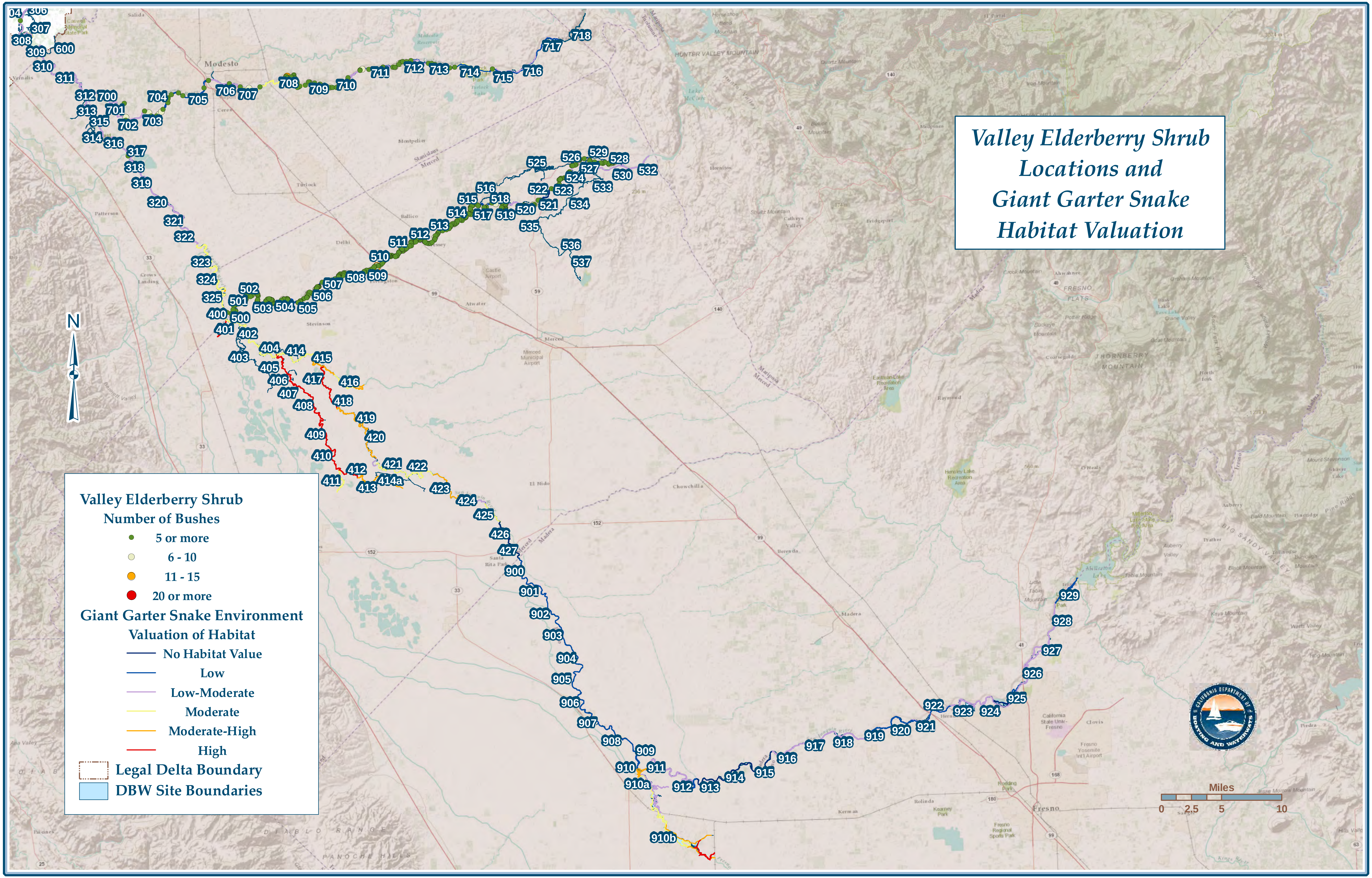
# Spongeplant Control Program Project Area - Northern Sites




Spongeplant Control Program Project Area - Southern Sites
Spongeplant Control Program
Area 1
Area 2
Area 3
Area 4
Legal Delta Boundary
USGS Quadrangles
Highways
Miles
0 2.5 5 10
N
Modesto
Turlock
Merced
Madera
Fresno
Clovis
Livingston
Atwater
Delhi
Los Banos
Chowchilla
Dos Palos
Kerman
Sanger
Reedley
Parlier
Selma
Hanford
Lemoore
Tracy
Ripon
Riverbank
Oakdale
Mariposa
Yosemite Lake Park
Fresno Flats
Madera
Lake Yosemite
Eastman Lake Recreation Area
Hensley Lake Recreation Area
Lake Wollomi
Lake Kaweah
Lake Tulare
Tulare Slough
Kings River
Fresno Slough
Mendota Pool
Fresno Regional
Thornberry Mountain
Hunter Valley Mountain
Chowchilla Mountain
Red Hill
Santa Clara
Stanislaus
Merced
Tuolumne
Mariposa
Madera
Fresno
Kings
Tulare
Kern
LATHROP o37121g3
TRACY o37121f4
RIPON o37121f2
VERNALIS o37121f3
SALIDA o37121f1
RIVERBANK o37120f8
WATERFORD o37120f7
PAULSELL o37120f6
COOPERSTOWN o37120f5
LA GRANGE o37120f4
COULTERVILLE o37120f2
BUCKHORN PEAK o37120f1
KINSLEY o37119f8
EL PORTAL o37119f7
EL CAPITAN o37119f6
HALF DOME o37119f5
MERCED PEAK o37119f4
MOUNT LYELL o37119f3
MT. RITTER o37119f2
PENON BLANCO PEAK o37120f3
LONE TREE CREEK o37121e4
SOLYO o37121e3
WESTLEY o37121e2
BRUSH LAKE o37121e1
CERES o37120e8
DENAIR o37120e7
MONTPELIER o37120e6
TURLOCK LAKE o37120e5
SNELLING o37120e4
MERCED FALLS o37120e3
HORNITOS o37120e2
BEAR VALLEY o37120e1
FELICIANA MTN. o37119e8
BUCKINGHAM MTN. o37119e7
WAWONA o37119e6
CATTLE MTN. o37119e2
MT. BOARDMAN o37121d4
COPPER MTN. o37121d3
PATTERSON o37121d2
CROWS LANDING o37121d1
HATCH o37120d8
TURLOCK o37120d7
CRESSEY o37120d6
WINTON o37120d5
YOSEMITE LAKE o37120d4
HAYSTACK MTN. o37120d3
INDIAN GULCH o37120d2
CATHEYS VALLEY o37120d1
MARIPOSA o37119d8
STUMPFIELD MTN. o37119d7
FISH CAMP o37119d6
BALLOON DOME o37119d2
COX RIDGE o37121c3
ORESTIMBA PEAK o37121c2
NEWMAN o37121c1
GUSTINE o37120c8
STEVINSON o37120c7
ARENA o37120c6
ATWATER o37120c5
MERCED o37120c4
PLANADA o37120c3
OWENS RESERVOIR o37120c2
ILLINOIS HILL o37120c1
BEN HUR o37119c8
HORSECAMP MOUNTAIN o37119c7
AHWAHNEE o37119c6
BASS LAKE o37119c5
SHUTEYE PEAK o37119c4
MAMMOTH POOL DAM o37119c3
KAISER PEAK o37119c2
MT. STAKES o37121c4
MISSISSIPPI CREEK o37121b4
MUSTANG PEAK o37121b3
CREVISON PEAK o37121b2
HOWARD RANCH o37121b1
INGOMAR o37120b8
SAN LUIS RANCH o37120b7
TURNER RANCH o37120b6
SANDY MUSH o37120b5
EL NIDO o37120b4
PLAINSBURG o37120b3
LE GRAND o37120b2
RAYNOR CREEK o37120b1
RAYMOND o37119b8
KNOWLES o37119b7
O'NEALS o37119b6
NORTH FORK o37119b5
CASCADEL POINT o37119b4
MUSICK MTN. o37119b3
HUNTINGTON LAKE o37119b2
GILROY HOT SPRINGS o37121a4
PACHECO PEAK o37121a3
PACHECO PASS o37121a2
VOLTA o37120a8
DELTA RANCH o37120a6
BLISS RANCH o37120a4
CHOWCHILLA o37120a3
KISMET o37120a1
BERENDA o37120a2
DAULTON o37119a8
LITTLE TABLE MTN. o37119a7
MILLERTON LAKE WEST o37119a6
MILLERTON LAKE EAST o37119a5
AUBERRY o37119a4
SHAVER LAKE o37119a3
DINKEY CREEK o37119a2
SAN FELIPE o36121h4
LOS BANOS o37120a7
SANTA RITA BRIDGE o37120a5
POSO FARM o36120h4
CHARLESTON SCHOOL o36120h7
OXALIS o36120h5
DOS PALOS o36120h6
FIREBAUGH NE o36120h3
BONITA RANCH o36120h2
MADERA o36120h1
GREGG o36119h8
LANES BRIDGE o36119h7
FRIANT o36119h6
ACADEMY o36119h5
HUMPHREYS STATION o36119h4
TRIMMER o36119h3
SACATE RIDGE o36119h2
HOLLISTER o36121g4
LAGUNA SECA RANCH o36120g7
HAMMONDS RANCH o36120g6
BROADVIEW FARMS o36120g5
FIREBAUGH o36120g4
MENDOTA DAM o36120g3
GRAVELLY FORD o36120g2
BIOLA o36120g1
HERNDON o36119g8
FRESNO NORTH o36119g7
CLOVIS o36119g6
ROUND MOUNTAIN o36119g5
PIEDRA o36119g4
PINE FLAT DAM o36119g3
LUCKETT MTN. o36119g2
MT. HARLAN o36121f4
PAICINES o36121f3
CHERRY PEAK o36121f2
PANOCHE PASS o36121f1
CERRO COLORADO o36120f8
MERCY HOT SPRINGS o36120f7
CHOUNET RANCH o36120f6
CHANEY RANCH o36120f5
COIT RANCH o36120f4
TRANQUILLITY o36120f3
JAMESAN o36120f2
KERMAN o36120f1
KEARNEY PARK o36119f8
FRESNO SOUTH o36119f7
MALAGA o36119f6
SANGER o36119f5
WAHTOKE o36119f4
ORANGE COVE NORTH o36119f3
TUCKER MTN. o36119f2
MOUNT JOHNSON o36121e3
BICKMORE CANYON o36121e2
SAN BENITO o36121e1
LLANADA o36120e8
PANOCHE o36120e7
TUMEY HILLS o36120e6
MONOCLINE RIDGE o36120e5
LEVIS o36120e4
CANTUA CREEK o36120e3
SAN JOAQUIN o36120e2
HELM o36120e1
RAISIN o36119e8
CARUTHERS o36119e7
CONEJO o36119e6
SELMA o36119e5
REEDLEY o36119e4
ORANGE COVE SOUTH o36119e3
STOKES MTN. o36119e2
PANOCHE HILLS



Valley Elderberry Shrub Locations and Giant Garter Snake Habitat Valuation
Valley Elderberry Shrub
Number of Bushes
5 or more
6 - 10
11 - 15
20 or more
Giant Garter Snake Environment
Valuation of Habitat
No Habitat Value
Low
Low-Moderate
Moderate
Moderate-High
High
DBW Site Boundaries
Legal Delta Boundary
Miles
0
2.5
5
10
N
SACRAMENTO
West Sacramento
Davis
Dixon
Dixon Ridge
SACRAMENTO VALLEY
Elmira
Travis Air Force Base
Rancho Cordova
Mather Airport
Sacramento Executive Airport
Elk Grove
Elk Grove Regional Park
Wilton
Franklin Field
Galt
Thornton
Herald
Acampo
Lodi
Victor
Clarksburg
Hood
Courtland
Ryde
RYER ISLAND
GRAND ISLAND
MERRITT ISLAND
TYLER ISLAND
STATEN ISLAND
ANDRUS ISLAND
BRANNAN ISLAND
MONTEZUMA HILLS
Birds Landing
Twitchell Island
Bouldin Island
Terminous
SHERMAN ISLAND
Bradford Island
Venice Island
King Island
Oak Grove Regional Park
Micke Grove Regional Park
Mandeville Island
Bethel Island
Jersey Island
Mc Donald Island
Bacon Island
ROBERTS ISLAND
VICTORIA ISLAND
UNION ISLAND
Holt
Stockton
Stockton Metropolitan Airport
Pittsburg
Antioch
Oakley
Knightsen
Brentwood
Contra Loma Regional Park
Prewett Family Park
Black Diamond Mines Regional Park
Clayton
Byron Airport
Bethany Reservoir State Rec Area
Tracy
Tracy Municipal Airport
Banta
Lathrop
Manteca
Vernalis
Caswell Memorial State Park
Middle River
San Joaquin
Wheeler Island
Van Sickle Island
Pleasanton Ridge Regional Park



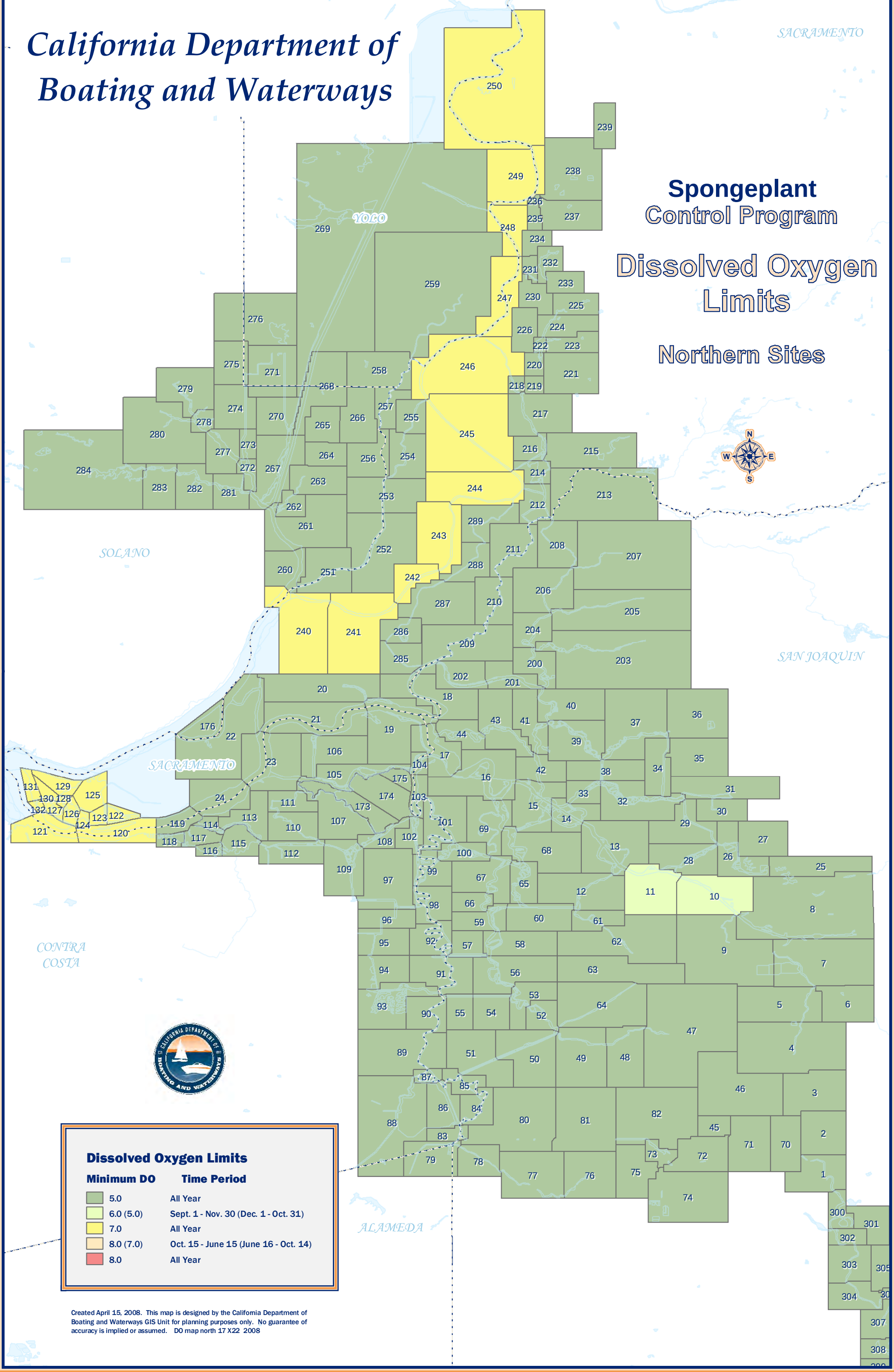
Valley Elderberry Shrub Locations and Giant Garter Snake Habitat Valuation
Valley Elderberry Shrub
Number of Bushes
5 or more
6 - 10
11 - 15
20 or more
Giant Garter Snake Environment
Valuation of Habitat
No Habitat Value
Low
Low-Moderate
Moderate
Moderate-High
High
Legal Delta Boundary
DBW Site Boundaries
N
Miles
0
2.5
5
10
Modesto
Fresno
Merced
Madera

# California Department of Boating and Waterways

## Spongeplant Control Program

## Dissolved Oxygen Limits

### Northern Sites




**Dissolved Oxygen Limits**

| Minimum DO | Time Period |
|---|---|
| 5.0 | All Year |
| 6.0 (5.0) | Sept. 1 - Nov. 30 (Dec. 1 - Oct. 31) |
| 7.0 | All Year |
| 8.0 (7.0) | Oct. 15 - June 15 (June 16 - Oct. 14) |
| 8.0 | All Year |

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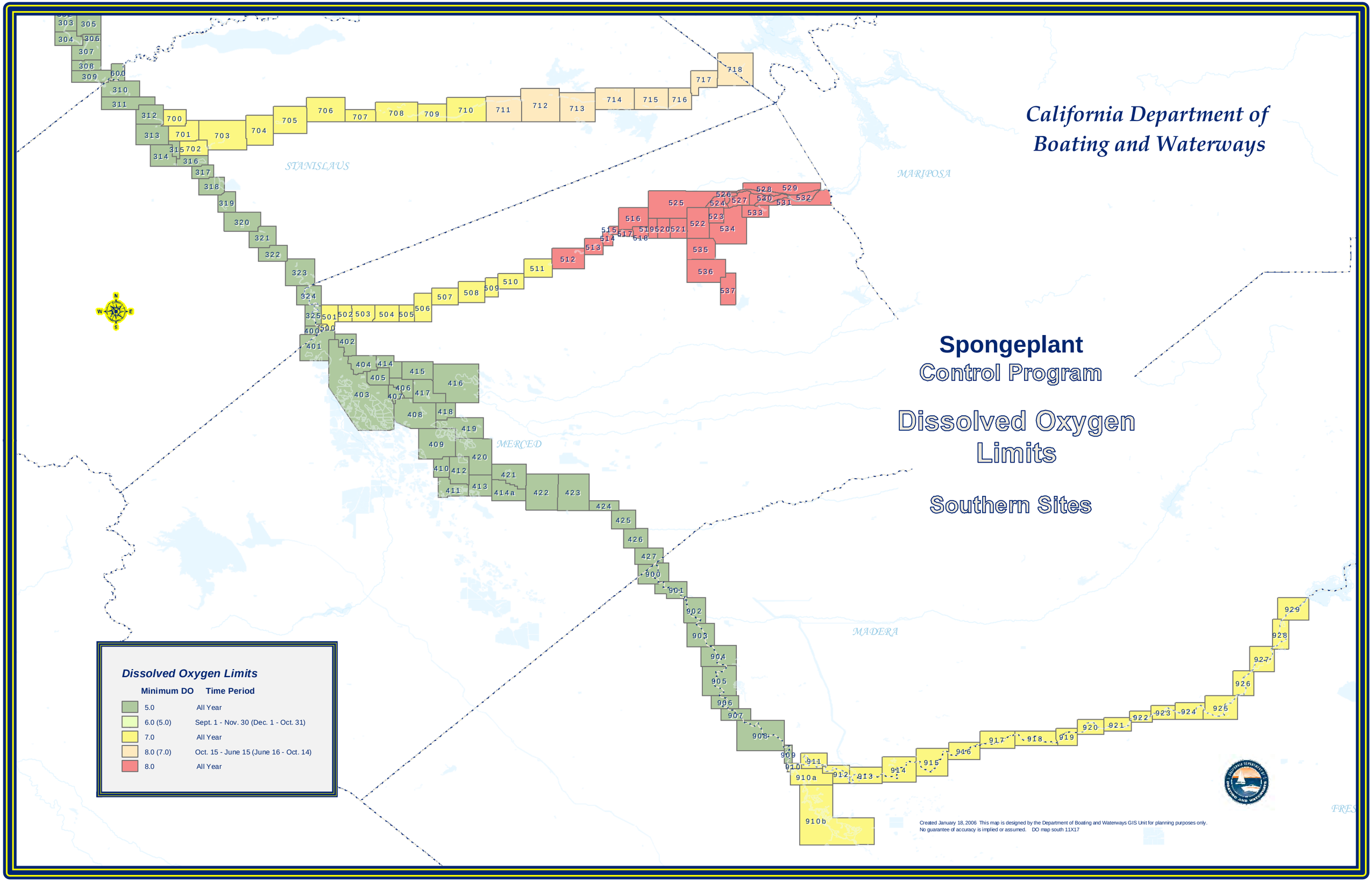
California Department of Boating and Waterways
Spongeplant
Control Program
Dissolved Oxygen Limits
Southern Sites
STANISLAUS
MARIPOSA
MERCED
MADERA
Dissolved Oxygen Limits
Minimum DO
Time Period
5.0
All Year
6.0 (5.0)
Sept. 1 - Nov. 30 (Dec. 1 - Oct. 31)
7.0
All Year
8.0 (7.0)
Oct. 15 - June 15 (June 16 - Oct. 14)
8.0
All Year
Created January 18, 2006 This map is designed by the Department of Boating and Waterways GIS Unit for planning purposes only.
No guarantee of accuracy is implied or assumed. DO map south 11X17