

1 Sandra A. Edwards (State Bar No. 154578)
Joshua W. Malone (State Bar No. 301836)
2 Farella Braun + Martel LLP
235 Montgomery Street, 17th Floor
3 San Francisco, CA 94104
Telephone: (415) 954-4400; Fax: (415) 954-4480
4 sedwards@fbm.com
jmalone@fbm.com

5 Joe G. Hollingsworth (appearance *pro hac vice*)
6 Martin C. Calhoun (appearance *pro hac vice*)
Kirby T. Griffis (appearance *pro hac vice*)
7 William J. Cople (appearance *pro hac vice*)
Hollingsworth LLP
8 1350 I Street, N.W.
Washington, DC 20005
9 Telephone: (202) 898-5800; Fax: (202) 682-1639
jhollingsworth@hollingsworthllp.com
10 mcalhoun@hollingsworthllp.com
kgriffis@hollingsworthllp.com
11 wcople@hollingsworthllp.com

12 George C. Lombardi (appearance *pro hac vice*)
James M. Hilmert (appearance *pro hac vice*)
13 Winston & Strawn LLP
35 West Wacker Drive
14 Chicago, IL 60601
Telephone: (312) 558-5969; Fax: (312) 558-5700
15 glombard@winston.com
jhilmert@winston.com

16 *Attorneys for Defendant*
17 MONSANTO COMPANY

18 **SUPERIOR COURT OF THE STATE OF CALIFORNIA**
19 **COUNTY OF SAN FRANCISCO**
20

21 DEWAYNE JOHNSON,
22 Plaintiff,

23 vs.

24 MONSANTO COMPANY,
25 Defendant.
26

Case No. CGC-16-550128

EXHIBITS 19-25 TO:

**DEFENDANT MONSANTO COMPANY'S
REQUEST FOR JUDICIAL NOTICE OF
U.S. ENVIRONMENTAL PROTECTION
AGENCY DOCUMENTS AND FEDERAL
REGISTER MATERIALS**

Trial Date: June 18, 2018
Time: 9:30 a.m.
Department: 504

ELECTRONICALLY
FILED
*Superior Court of California,
County of San Francisco*
06/18/2018
Clerk of the Court
BY: RONNIE OTERO
Deputy Clerk

Exhibit 19



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AND

OFFICE OF
PREVENTION, PESTICIDES
TOXIC SUBSTANCES

JUL 1 - 2009

Ms. Dawn Fee-White
Monsanto Company
1300 I Street, NW—Suite 450 East
Washington, DC 20005

Dear Ms. Fee-White:

Subject: Roundup ProMax Herbicide (Revise Master Label)
EPA Registration No. 524-579
Application Dated May 13, 2009

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act as amended is acceptable provided you make the following changes before you release the product for shipment.

1. On page 2, revise the fourth paragraph to read "Not all products **listed** on this label are registered for use in California."
2. On page 3 and 17, revise the Heading for Section 8.0 to read "Site and Use **Instructions**".
3. On page 10, under Cultural Considerations, revised the section by replacing the word "recommended" with the word "specified".
4. On page 12, under Tank Mixing, revise the first sentence of the second paragraph to read "When this label **lists** a tank mixture with a generic active ingredient..."
5. On page 13, under Colorants and Dyes, revise the last sentence to read "Use colorants or dyes according to the manufacturer's **directions**."
6. On page 27, under Utility Sites, revise the first sentence of the fourth paragraph to read "This product **also may be used** in preparing or establishing wildlife openings within these sites."
7. On page 43, Supplemental B, revise the first note to read "The **labeled** rate for this use will limit the level of control of certain species of weeds."

Page 2

EPA Registration No. 524-579

Submit one copy of final printed labeling incorporating the above changes before you release the product for shipment. Amended labeling will supersede all previously approved ones. A stamped copy of labeling is enclosed for your records.

Sincerely,

James A. Tompkins
James A. Tompkins
Product Manager 25
Herbicide Branch
Registration Division (7505P)

MASTER LABEL FOR EPA REG. NO. 524-579

Registered Brand Names:

Roundup PROMAX Herbicide

Table of Contents for Master Label

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[INSERT BRAND NAME]

Herbicide

The complete broad-spectrum postemergence professional herbicide for non-crop, industrial, turf and ornamental weed control.

Complete Directions for Use

EPA Reg. No. 524-579

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION IS LIKELY TO RESULT.

Read the entire label before using this product.

Use only according to label instructions.

Not all products recommended 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.

Refillable Container Label Statement

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. REPACKAGING OF THIS PRODUCT FOR DISTRIBUTION OR SALE MAY BE CONDUCTED ONLY UNDER THE TERMS OF A WRITTEN CONTRACT WITH MONSANTO .

Non-Refillable Container Label Statement:

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING

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PRODUCT INFORMATION

1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its potassium salt.....48.7%

OTHER INGREDIENTS: 51.3%
100.0%

*Contains 660 grams per liter or 5.5 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its potassium salt. Equivalent to 540 grams per liter or 4.5 pounds per U.S. gallon of the acid, glyphosate.

This product is protected by U.S. Patent No's. 5,668,085 and 6,365,551. Other patents pending. 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!

CAUSES MODERATE EYE IRRITATION

Avoid contact with eyes or clothing. Avoid breathing vapor or spray mist.

ACCEPTED
with COMMENTS
In EPA Letter Dated:
JUL 1 - 2009

Under the Federal Insecticide,
Fungicide, and Rodenticide Act,
as amended, for the pesticide
registered under EPA Reg. No.
524-579

FIRST AID: Call a poison control center or doctor for treatment advice.	
IF IN EYES	<ul style="list-style-type: none">• 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.
<ul style="list-style-type: none">• Have the product container or label with you when calling a poison control center or doctor, or going for treatment.• You may also contact (314) 694-4000, collect day or night, for emergency medical treatment information.• This product is identified as [INSERT BRAND NAME], EPA Registration No. 524-579.	

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. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

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 clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

3.2 Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

3.3 Physical or Chemical Hazards

Spray solutions of this product can 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. Supplemental labeling can be found on the Internet at www.agrian.com, www.cdms.net or www.greenbook.net, or obtained from your Authorized Monsanto Retailer or Monsanto Company Representative.

The following paragraph is reserved and will only appear on final printed labeling for products under this registration if and when required by EPA:

ENDANGERED SPECIES PROTECTION REQUIREMENTS: This product may have effects on federally listed threatened or endangered species or their critical habitat in some locations. When using this product, you must follow the measures contained in the Endangered Species Protection Bulletin for the county or parish in which you are applying the pesticide. To determine whether your county or parish has a Bulletin, and to obtain that Bulletin, consult <http://www.epa.gov/espp/>, or call 1-800-447-3813 no more than 6 months before using this product. Applicators must use Bulletins that are in effect in the month in which the pesticide will be applied. New Bulletins will generally be available from the above sources 6 months prior to their effective dates.

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, is: 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 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.

[Alternate PESTICIDE DISPOSAL statement for transport vehicles only: To avoid wastes, empty as much product from this transport vehicle as possible for repackaging or use in accordance with label directions. If wastes cannot be avoided, offer remaining product or rinsate to a waste disposal facility or pesticide disposal program. 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 for refilling limitations.

[CONTAINER HANDLING AND DISPOSAL STATEMENT AND REFILLING LIMITATION FOR NONREFILLABLE RIGID CONTAINERS OF LESS THAN 1-GALLON CAPACITY]

Nonrefillable container. Do not reuse or refill this container.

[Alternate container statement: Nonrefillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to

temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state.]

Triple rinse this container 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 $\frac{1}{4}$ 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 this container for recycling, if available. If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

[Alternate container disposal statement: Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-ROUNDUP (1-800-768-6387). If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.]

[CONTAINER HANDLING AND DISPOSAL STATEMENT AND REFILLING LIMITATION FOR NONREFILLABLE RIGID PLASTIC 2.5-GALLON CONTAINERS AND OTHER CONTAINERS OF GREATER THAN 1-GALLON BUT EQUAL TO OR LESS THAN 5-GALLON CAPACITY]

Nonrefillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state.

[Alternate container statement: Nonrefillable container. Do not reuse or refill this container.]

Triple rinse or pressure rinse (or equivalent) this container 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 $\frac{1}{4}$ 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.

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.

Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-ROUNDUP (1-800-768-6387). If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

[*Alternate container disposal statement:* Then offer this container for recycling, if available. If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.]

[CONTAINER HANDLING AND DISPOSAL STATEMENT AND REFILLING LIMITATION FOR NONREFILLABLE RIGID PLASTIC 30-GALLON CONTAINERS AND OTHER CONTAINERS OF GREATER THAN 5-GALLON CAPACITY]

Nonrefillable container. Do not reuse or refill this container.

[Alternate container statement: Nonrefillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state.]

Triple rinse or pressure rinse (or equivalent) this container promptly after emptying.

Triple rinse 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 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 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.

Once properly rinsed, some plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-ROUNDUP (1-800-768-6387). If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.

[Alternate container disposal statement: Then offer this container for recycling, if available. If recycling is not available, dispose of in accordance with federal, state and local regulations and procedures, which may include puncturing the properly rinsed container and disposing in a sanitary landfill.]

[Optional container label statement: Return Properly Rinsed Container to Monsanto for Recycling Contact: 1-800-ROUNDUP (1-800-768-6387)]

[CONTAINER HANDLING AND DISPOSAL STATEMENT AND REFILLING LIMITATION FOR ALL REFILLABLE CONTAINERS, EXCEPT TRANSPORT CONTAINERS]

Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose.

Cleaning this container before refilling is the responsibility of the refiller. Cleaning this container before final disposal is the responsibility of the person disposing of the container.

To clean this container before final disposal, empty the remaining contents from this container into application equipment or a 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 this container for

recycling, if available. To obtain information about recycling refillable containers, contact Monsanto Company at 1-800-ROUNDUP (1-800-768-6387).

[Optional container label statement: Return Properly Rinsed Container to Monsanto for Recycling, Contact 1-800-ROUNDUP (1-800-768-6387)]

5.0 GENERAL INFORMATION

Product Description: This product is a postemergence, systemic herbicide with no soil residual activity. It gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid containing surfactant and no additional surfactant is needed or recommended.

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 aboveground growth and deterioration of underground plant parts. Effects are visible on most annual weeds within 2 to 4 days, but on most perennial weeds, effects may not be visible for 7 or more days. 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.

Mode of Action in Plants: The active ingredient in this product inhibits an enzyme found only in plants and microorganisms that is essential to the formation of specific amino acids.

Cultural Considerations: Reduced control may 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 recommended 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.

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. Plants arising from unattached underground rhizomes or rootstocks of perennials that have not yet emerged at the time of application will not be affected by this 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 7 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 have other unintended consequences.

5.1 Weed Resistance Management

GROUP	9	HERBICIDE
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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 herbicides 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.
- Utilize the labeled rate for the most difficult weed in the site. Avoid tank-mixtures with other herbicides that reduce this product's efficacy (through antagonism) or tank mixture recommendations which encourage rates of this product below the labeled rate.
- 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 Recommendations for Glyphosate-Resistant Weed Biotypes

NOTE: Appropriate testing is critical in order to confirm weed resistance to glyphosate. Call 1-800-ROUNDUP (1-800-768-6387) or contact your Monsanto representative to determine if resistance in any particular weed biotype has been confirmed in your area, or visit on the Internet www.weedresistancemanagement.com or www.weedscience.org.

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, including 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. Clean sprayer parts immediately after using this product by thoroughly flushing with water.

Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by State or local regulations.

6.1 Mixing with Water

NOTE: PRODUCT PERFORMANCE MAY BE SIGNIFICANTLY REDUCED IF WATER CONTAINING SOIL SEDIMENT IS USED AS CARRIER. DO NOT MIX THIS PRODUCT WITH WATER FROM PONDS AND DITCHES THAT IS VISIBLY MUDDY OR MURKY.

This product mixes readily with water. Mix spray solutions of this product as follows: Begin filling the mixing tank or spray tank with clean water. Add the proper amount of this product near the end of the filling process and mix gently. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foaming, mix gently, terminate by-pass and return lines at the bottom of the tank and, if necessary, use an anti-foam or defoaming agent.

6.2 Tank Mixing

This product does not provide residual weed control. This product may be tank-mixed with other herbicides to provide residual weed control, a broader weed control spectrum or an alternate mode of action. 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.

When this label recommends a tank mixture with a generic active ingredient such as diuron, atrazine, 2,4-D, dicamba, diuron or pendimethalin the user is responsible for ensuring that the specific application being made is included on the label of the specific product being used in the tank mixture. Refer to all individual product labels, supplemental labeling and fact sheets for all products in the tank mixture, and observe all precautions and limitations on the label, including application timing restrictions, soil restrictions and use according to the most restrictive precautionary statements for each product in the tank mixture.

Always predetermine the compatibility of all tank-mix products together in the carrier by mixing small proportional quantities in advance.

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 expressed in this label. Mixing this product with herbicides or other materials not on this label may result in reduced performance.

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 until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation may be 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.

Refer to the **Tank Mixing** and **GENERAL INFORMATION** sections for additional precautions.

6.4 Mixing for Hand-Held Sprayers

Prepare the desired spray volume by mixing the amount of this product indicated in the following table in water:

Spray Solution

Desired Volume	Amount of [INSERT BRAND NAME]					
	0.4%	0.7%	1.0%	1.5%	4%	7%
1 gal	0.5 oz	1 oz	1.3 oz	2 oz	5 oz	9 oz
25 gal	0.8 pt	0.7 qt	1 qt	1.5 qt	4 qt	7 qt
100 gal	1.6 qt	2.8 qt	1 gal	1.5 gal	4 gal	7 gal

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, add the appropriate amount of this product, mixed with water in a larger container and then filling sprayer with the mixed solution.

6.5 Colorants or Dyes

Colorants or marking dyes may be added to spray solutions of this product; however, they can reduce product performance, especially at lower rates or dilution. Use colorants or dyes according to the manufacturer's recommendations.

7.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

APPLY SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

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, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

AVOID DRIFT. DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Avoid direct application to any body of water.

Use the labeled rates of this herbicide in 3 to 25 gallons of water per acre unless otherwise specified on this label, or in separate supplemental labeling or fact sheets published by Monsanto for this product.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray

volume by increasing nozzle pressure. Drift control additives may be used. When a drift control 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; Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. LANDING GEAR IS MOST SUSCEPTIBLE. Maintaining an organic coating (paint) that meets aerospace specification MIL-C-38413 may prevent corrosion.

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 the grower are responsible for considering all these factors when making decisions.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial application.

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 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 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 speed, 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

When making applications in low relative humidity, setup 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 be made 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, the movement of smoke from a ground source or an aircraft smoke generator can also identify temperature inversions. 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

Apply this product 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

Apply the labeled rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified on this label, or in separate supplemental labeling or fact sheets published by Monsanto for this product. As density of weeds increases, spray volume should be increased within 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 uniform distribution of spray droplets.

7.3 Hand-Held or Backpack 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 low-volume directed spray applications, spray coverage should be uniform with at least 50 percent of the foliage contacted. Coverage of the top one-half of the plant is important for best results. 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.

7.4 Selective Equipment

This product may be diluted in water and applied through shielded applicators, hooded sprayers, wiper applicators or sponge bars to weeds listed on this label growing in any non-crop site specified on this label.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION, AS SERIOUS INJURY OR DEATH OF THE DESIRABLE VEGETATION IS LIKELY TO OCCUR.

Application equipment 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. **EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

Wiper Applicators

Wiper applicators are devices that physically wipe the appropriate amounts of this product directly onto the weed. Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation.

Application equipment used over the top of desirable vegetation should be adjusted so that the wiper contact point is at least 2 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds should be a minimum of 6 inches above the desirable vegetation. Adjust the height of the applicator to ensure adequate contact with weeds. Weeds not contacted by the herbicide solution will not be affected. Poor contact may occur when weeds are growing in dense clumps, in severe weed infestations or when weed height varies dramatically. In these instances, repeat treatments may be necessary.

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 provide adequate wiper saturation with the herbicide solution. Better results may be obtained when two applications are made in opposite directions.

Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation may result in discoloration, stunting or destruction. Avoid leakage or dripping onto desirable vegetation. 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 the wiper applicator.

Do not use wiper applicators when weeds are wet.

Mix only the amount of this product to be used during a 1-day period, as reduced product performance may result from the use of solutions held in storage. Clean wiper parts immediately after using this product by thoroughly flushing with water.

For Rope or Sponge Wick Applicators—Solutions ranging from 25 to 70 percent of this product in water may be used.

For Panel Applicators and pressure-feed systems—Solutions ranging from 25 to 100 percent of this product in water may be used.

When applied as directed, this product **CONTROLS** the following weeds:

Corn, volunteer	Sicklepod
Panicum, Texas	Spanishneedles
Rye, common	Starbur, bristly
Shattercane	

When applied as directed, this product **SUPPRESSES** the following weeds:

Beggarweed, Florida	Ragweed, common
Bermudagrass	Ragweed, giant
Dogbane, hemp	Smutgrass
Dogfennel	Sunflower
Guineagrass	Thistle, Canada
Johnsongrass	Thistle, musk
Milkweed	Vaseygrass
Nightshade, silverleaf	Velvetleaf
Pigweed, redroot	

7.5 Injection Systems

This product may 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 instructed in this label.

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 directed in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 2 to 15 gallons of water 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 green tissue of desirable vegetation, as damage or destruction is likely to result.

8.0 SITE AND USE RECOMMENDATIONS

This product may be used in non-crop areas such as airports, apartment complexes, commercial sites, ditch banks, driveways, dry ditches, dry canals, fencerows, golf courses, greenhouses, industrial sites, landscape areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parks, parking areas, pastures, petroleum tank farms and pumping installations, public areas, railroads, rangeland, recreation areas, residential areas, rights-of-way, roadsides, schools, shadehouses, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas and wildlife management areas.

This product may also be used in non-food crop sites such as Christmas tree farms, plant nurseries, sod or turf seed farms.

Unless otherwise specified, applications may be made to control any weeds listed in the **WEEDS CONTROLLED** section of this label.

8.1 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, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or sprouts 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.

Alder	Reed, giant
Eucalyptus	Saltcedar
Madrone	Sweetgum
Oak	Tan oak
Pepper, Brazilian	Willow
Pine, Austrian	

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.

8.2 Forestry Site Preparation

This product is labeled for the control or partial control of woody brush, trees and herbaceous weeds in forestry. This product is also labeled for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

Use this product for site preparation prior to planting any tree species, including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites.

Use the higher rates of this product within the specified range for control or partial control of woody brush, trees and hard-to-control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop. Increase rates within the specified range for control of perennial herbaceous weeds any time after emergence and before seedheads, flowers or berries appear.

Use the lower rates of this product within the specified range for control of annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to the foliage of actively growing annual herbaceous weeds any time after emergence.

TANK MIXTURES: Tank mixtures of this product may be used to increase the spectrum of vegetation controlled. 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 may be used in a tank mix with the following products for forestry site preparation.

Arsenal Applicators Concentrate
Chopper
Escort or Escort XP
Garlon 3A
Garlon 4

Landmark XP

Oust XP

Westar

For control of herbaceous weeds, use the lower labeled tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher labeled rates.

Do not apply this product as an over-the-top broadcast spray for forestry conifer or hardwood release unless otherwise specified on this label, or in separate supplemental labeling or fact sheets published by Monsanto for this product.

8.3 General Areas and Industrial Sites

General Weed Control, Trim-and-Edge, Bare Ground

This product may be used in general non-crop and non-food crop areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around objects in these sites, for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

TANK MIXTURES: This product may be tank mixed with the following products, provided that the specific product is labeled for application at the use site. Refer to the individual product labels for approved sites and application rates.

Arsenal	atrazine ¹	Certainty
Barricade 65WG	Crossbow L	dicamba ¹
diuron ¹	Endurance	Escort or Escort XP
Gallery 75DF	Garlon 3A	Garlon 4
Goal 2XL	Karmex DF	Krovar I DF
Landmark II MP	Landmark MP	Landmark XP
Milestone		Oust XP
Outrider®	Pendulum 3.3 EC	Pendulum WDG
pendimethalin ¹	Plateau	Poast
Princep DF	Princep 4L	Ronstar 50WP
Sahara	simazine ¹	Surflan AS
Surflan WDG	Telar	Transline
Vanquish	Velpar DF	Velpar L
2,4-D ¹		

¹ Tank mixtures with products containing this single active ingredient may be made provided the specific product is labeled for application at the use site.

This product plus dicamba tank mixtures may not be applied by air in California.

When applied as a tank mixture for bare ground, this product provides control of the emerged annual weeds and control or partial control of emerged perennial weeds, woody brush and trees.

For control or partial control of the following perennial weeds, apply 22 to 44 fluid ounces of this product plus 2 to 4 ounces of Oust XP per acre.

Bahiagrass	Johnsongrass
Bermudagrass	Poorjoe

122
49

Broomsedge
Dallisgrass
Dock, curly
Dogfennel
Fescue, tall

Quackgrass
Vaseygrass
Vervain, blue

Chemical Mowing - Perennials

This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Use 5 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass, quackgrass or reed canarygrass covers. Use 4 fluid ounces of this product per acre when treating Kentucky bluegrass. Apply treatments in 10 to 40 gallons of spray solution per acre.

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.

8.4 Turfgrass

Dormant Turfgrass

This product may be used 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 green-up.

Apply 5 to 44 fluid ounces of this product 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 11 fluid ounces per acre may result in injury or delayed green-up in highly maintained areas, such as golf courses and lawns. DO NOT apply tank mixtures of this product plus Oust XP in highly maintained turfgrass areas.

Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. DO NOT apply more than 11 fluid ounces of this product per acre in highly maintained turfgrass areas. DO NOT apply tank mixtures of this product plus Oust XP in highly maintained turfgrass areas. 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.

Desirable turfgrasses may be planted following the above procedures.

Hand-held equipment may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

PRECAUTIONS, RESTRICTIONS: 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. If application rates total 2 quarts per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 2 quarts per acre, remove livestock before application and wait 8 weeks after application before grazing or harvesting.

8.5 Habitat Management

Habitat Restoration and Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including 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

This product may be used 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.

8.6 Hollow Stem Injection

This product may be applied through hand-held injection devices that deliver recommended amounts of this product into targeted hollow-stem plants growing in any site specified on this label.

For control of the following hollow-stem plants, follow the use instructions below:

Castorbean, *Ricinus communis*

Inject 4 ml per 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 the 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 the 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 per stem of this product. Use a small syringe that calibrates to this rate.

Knotweed, Bohemian, *Polygonum bohemicum*

Inject 5 ml per stem of this product between the second and third internode.

Knotweed, Giant, *Polygonum sachalinense*

Inject 5 ml per stem of this product between second and third internode.

Knotweed, Japanese, *Polygonum cuspidatum*

Inject 5 ml per stem of this product between second and third internode.

Reed, Giant *Arundo donax*

Inject 6 ml per stem of this product between second and 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 per stem of this product is injected into the stem.

Note: The combined total for all treatments must not exceed 7 quarts of this product per acre. At 5 ml per stem, 7 quarts should treat approximately 1300 stems per acre.

8.7 Injection and Frill (Woody Brush and Trees)

This product may be used to control woody brush and trees by injection or frill applications. Apply this product 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 run-off 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 concentration of this product. For best results, application should be made during periods of active growth and after full leaf expansion. This product will control many species, some of which are listed below:

<u>Control</u>	<u>Partial Control</u>
Oak	Black gum
Poplar	Dogwood
Sweetgum	Hickory
Sycamore	Maple, red

8.8 Non-Food Tree, Shrub, or Vine Production Sites

This product may be used for general weed control prior to the planting of and around established ornamentals, or any woody tree, shrub or vine species, including arborvitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce and yew, growing in plant nurseries, on Christmas tree farms, or on other non-food tree production sites.

UNLESS OTHERWISE DIRECTED, THIS PRODUCT IS NOT RECOMMENDED FOR USE AS AN OVER-THE-TOP BROADCAST SPRAY IN ORNAMENTALS AND CHRISTMAS TREES. Care must be taken to avoid contact of spray, drift or mist with foliage or bark of desirable ornamental species.

This product may also 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 until after the application has dried.

TYPES OF APPLICATION: Site Preparation, Post-directed, Trim-and-edge, Wiper Application

Site Preparation

This product may be used prior to planting any tree, shrub or vine, including Christmas tree species, in a nursery or production setting.

Post-Directed, Trim-and-Edge

This product may be used as a post-directed spray around established woody ornamental species, or to trim and edge around trees, buildings, sidewalks, roads, potted plants and other objects in a production setting.

Desirable plants may be protected from the spray solution by using shields or coverings made of cardboard or other impermeable material.

Wiper Application

This product may be used through wick or other suitable wiper applicators to control or partially control undesirable vegetation around established trees, shrubs or vines. See the **SELECTIVE EQUIPMENT** section of this label for further information about the proper use of wiper applicators.

8.9 Parks, Recreational and Residential Areas

All of the instructions in the **General Areas and Industrial Sites** section may be made in park and recreational areas.

This product may be used in parks, recreational and residential areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around trees, fences, paths, around buildings, sidewalks and other objects in these areas. This product may be used for spot treatment of unwanted vegetation. This product may be used to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

8.10 Railroads

All of the instructions in the **General Areas and Industrial Sites** section may be made to railroads.

Bare ground, Ballast and Shoulders, Crossings, Spot Treatment

This product may be used to maintain bare ground on railroad ballast and shoulders. Repeat applications of this product may be used, as weeds emerge, to maintain bare ground. This product may 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 may be tank mixed with the following products for ballast, shoulder, spot, bare ground and crossing treatments provided the specific product used is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates:

Arsenal	atrazine ¹
dicamba ¹	diuron ¹
Escort	Escort XP
Garlon 3A	Garlon 4
Hyvar X	Hyvar X-L
Krovar I DF	
Oust XP	Outrider
Sahara DG	simazine ¹
Spike 80DF	Telar DF
Transline	Vanquish
Velpar DF	Velpar L
2,4-D ¹	

¹ Tank mixtures with products containing this single generic active ingredient may be made provided the specific product is labeled for application at the use site.

Brush Control

This product may be used to control woody brush and trees on railroad rights-of-way. Apply 2.5 to 7 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 0.7- to 1.5-percent solution of this product when using high-volume spray-to-wet applications. Apply a 4- to 7-percent solution of this product when using low volume directed sprays for spot treatment.

TANK MIXTURES: This product may be mixed with the following products for ballast, shoulder, spot, bare ground and crossing treatments as well as for enhanced control of woody brush and trees, provided the specific product used is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates:

Arsenal	atrazine ¹
dicamba ¹	diuron ¹
Escort	Escort XP
Garlon 3A	Garlon 4
Hyvar X	Hyvar X-L
Sahara DG	simazine ¹
Spike 80 DF	Vanquish
Transline	Velpar L
Velpar DF	2,4-D ¹

¹ Tank mixtures with products containing this single generic active ingredient may be made provided the specific product is labeled for application at the use site.

Bermudagrass Release

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 11 to 32 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	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

This product may be tank-mixed with Oust XP. If tank-mixed, use no more than 11 to 32 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	Fescue, tall
Blackberry	Johnsongrass
Bluestem, silver	Poorjoe
Broomsedge	Raspberry
Dallisgrass	Trumpetcreeper
Dewberry	Vaseygrass
Dock, curly	Vervain, blue
Dogfennel	

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications in the same season are not recommended, since severe injury may occur.

8.11 Roadsides

All of the applications in the **General Areas and Industrial Sites** section may be made on roadsides.

Shoulder Treatments

This product may be used on road shoulders. It may be 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 may be used to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment

This product may be used as a spot treatment to control unwanted vegetation growing along roadsides.

TANK MIXTURES: This product may be tank-mixed with the following products, for shoulder, guardrail, spot and bare ground treatments provided that the specific product used is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates:

atrazine ¹	Oust XP
Clarity	Outrider
Crossbow L	Pendulum 3.3 EC
dicamba ¹	Pendulum WDG
diuron ¹	Plateau
Endurance	Princep DF
Escort	Princep 4L
Escort XP	Ronstar 50WP
Gallery 75 DF	Sahara
Krovar I DF	simazine ¹
Landmark II MP	Surflan
Landmark MP	Telar
Landmark XP	Vanquish
	2,4-D ¹

¹ Tank mixtures with products containing this single generic active ingredient may be made provided the specific product is labeled for application at the use site.

Release of Bermudagrass or Bahiagrass

Dormant Applications

This product may 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 green-up. This product may also be tank-mixed with Outrider, or Oust XP for residual control. Tank mixtures of this product with Oust XP may delay green-up.

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 5 to 44 fluid ounces of this product in a tank mix with 0.75 to 1.33 ounces of Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

Apply 6 to 44 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 green-up 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 may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 11 to 32 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	Johnsongrass
Bluestem, silver	Trumpet creeper
Fescue, tall	Vaseygrass

This product may be tank-mixed with Outrider herbicide for control or partial control of Johnsongrass and other weeds listed on the Outrider label. Use 5 to 22 fluid ounces of this product with 0.75 to 1.33 ounces of Outrider per acre. Use the higher rates of both products for control of perennial weeds or annual weeds greater than 6 inches in height.

This product may be tank-mixed with Oust XP. If tank-mixed, use no more than 11 to 22 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	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpet creeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not recommended, 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 green-up 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 1.5 to 3 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

This product may be used for control or partial control of Johnsongrass and other weeds listed on the Outrider herbicide label. Apply 4 fluid ounces of this product with 0.75 to 2.0 ounces of Outrider per acre. Use the higher rates for control of perennial weeds and 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 0.25 ounce of Oust XP per acre 1 to 2 weeks following an initial spring mowing. Make only one application per year.

8.12 Rangelands

This product will control or suppress many annual weeds growing in perennial cool- and warm-season grass rangelands, pastures, and industrial sites. Preventing weed seed production is critical to the successful control of annual grassy weeds invading these perennial grass sites. 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.

Bromus: This product may be used to control or suppress downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*), cheatgrass (*Bromus secalinus*), cereal rye and jointed goatgrass found in rangelands pastures and industrial sites. Apply 5 to 11 fluid ounces of this product per acre on a broadcast basis.

For best results, treatment should coincide with early seedhead emergence of the most mature plants. Delaying the application until this growth stage will maximize the emergence of other weedy grass flushes. Applications should be made to the same site each year until seed banks are depleted and the desirable perennial grasses can become reestablished on the site.

Medusahead: To control or suppress medusahead, apply 11 fluid ounces of this product per acre at the 3-leaf stage when plants are actively growing. Delaying applications beyond this stage will result in reduced or unacceptable control. Repeat applications in subsequent years may be necessary to eliminate the seedbank before reestablishing desirable perennial grasses. Applications may be made in the fall or spring.

Applications may be made using ground or aerial equipment. Aerial applications for these uses may be made using fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For applications using ground equipment, apply in 10 to 20 gallons of water per acre.

Spot Treatment, Wiper Application

This product may be applied in rangeland, pastures or industrial sites as a spot treatment, or over the top of desirable grasses using wiper applicators to control tall weeds. Applications may be repeated in the same area at 30-day intervals.

For spot treatments or wiper application methods using rates of 2 quarts of this product per acre or less, the entire site or any portion of it may be treated. When spot treatments or wiper applications are made using rates above 2 quarts of this product per acre, no more than 10 percent of the total site 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 for feed.

8.13 Utility Sites

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 this product in 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 may be used prior to planting a utility site to ornamentals, flowers, turfgrass (sod or seed), or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

This product is also recommended for use in preparing or establishing wildlife openings within these sites, maintaining access roads and for side trimming along utility rights-of-way.

TANK MIXTURES: This product may be tank mixed with the following products for use in utility sites, provided that the specific product used is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates.

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 tank mixture rates.

Arsenal
Barricade 65WG

atrazine ¹
dicamba ¹

diuron ¹	Endurance
Escort	Escort XP
Garlon 3A ²	Garlon 4 ³
Krenite	Krovar I DF
	Oust XP
Outrider	pendimethalin ¹
Plateau	
Ronstar 50WP	Sahara
simazine ¹	Surflan AS
Surflan WDG	Telar DF
Transline	Vanquish
Velpar DF	Velpar L
2,4-D ¹	

¹ Tank mixtures with product containing this generic active ingredient may be made provided the specific product is labeled for application at the use site.

² 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 incompatibility problems.

³ For side trimming treatments, this product can be used alone or in a tank mixture with Garlon 4.

8.14 Grass Seed or Sod Production

Use this product in grass seed and sod production for preplant, at-planting, preemergence, removal of established stands, renovation, site preparation, shielded spraying, wiper application, spot treatment, and creating rows in annual ryegrass.

Preplant, At-Planting, Preemergence, Removal of Established Stands, Renovation, Site Preparation

This product controls most existing vegetation for purposes of renovating turf or forage grass seed areas or for establishing turfgrass grown for sod. It may also be used to destroy remaining undesired grass vegetation when production fields are converted to alternate species or crops. Make applications before, during, or after planting, or for renovation purposes. Applications must be made prior to crop emergence in order to avoid crop injury. 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 herbicide 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. Application rates up to 3.3 quarts per acre may be used to totally remove established stands of tough to kill grass species.

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 2 quarts per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 2 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

Shielded Sprayers

Apply 22 to 64 fluid ounces of this product in 10 to 20 gallons of water per acre to control weeds between grass seed rows. Uniform planting in straight rows aids in shielded sprayer applications. Best results are obtained when the grass seed plants are small enough to easily pass by the protective shields.

Contact of this product in any manner with desirable vegetation may result in discoloration, stunting or destruction. Such damage shall be the sole responsibility of the applicator.

Wiper Application

This product may be applied over the top of desirable grasses using wiper applicators for the control of tall weeds.

Contact of this product in any manner with desirable vegetation may result in discoloration, stunting or destruction. Such damage shall be the sole responsibility of the applicator.

Spot Treatment

Apply a 1-percent solution of this product using hand-held spray equipment to control weeds within established vegetation prior to heading of grasses grown for seed. Hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

The grass sprayed in the treated area will be killed. Take care not to spray or allow spray to drift outside the target area in order to avoid unwanted grass injury or destruction.

Creating Rows in Annual Ryegrass

Apply 11 to 22 fluid ounces of this product per acre. Best results are obtained when applications are made before the ryegrass reaches 6 inches in height. Use the higher rate within the labeled range when ryegrass is greater than 6 inches in height.

Set nozzle heights to allow the establishment of the desired row spacing. Use of low-pressure nozzles, or drop nozzles designed to target the application over a narrow band are recommended.

Take care not to spray or allow spray to drift outside target area in order to avoid unwanted grass destruction.

Grower assumes all responsibility for losses resulting from misapplication of this product.

8.15 Pastures

This product may be applied to any pasture grass (other than food crops in the *Gramineae* family), including bahiagrass, bermudagrass, bluegrass, brome, fescue, guineagrass, kikuyugrass, orchardgrass, pangola grass, ryegrass, timothy, and wheatgrass. Application can be made as a spot treatment, wiper application, preplant, preemergence, pasture renovation, or postemergent broadcast.

Preplant, Preemergence, Pasture Renovation

This product may be applied for weed control prior to planting or emergence of forage grasses. This product may also be applied to control perennial pasture species listed on this label prior to replanting.

If application rates total 2 quarts per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 2 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

Spot Treatment, Wiper Application

This product may be applied in pastures as a spot treatment, or over the top of desirable grasses using wiper applicators to control tall weeds. Applications may be repeated in the same area at 30-day intervals.

For spot treatments or wiper application methods using rates of 2 quarts of this product per acre or less, the entire field or any portion of it may be treated. When spot treatments or wiper applications are made using rates above 2 quarts of this product 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 for feed.

Postemergent Weed Control (Broadcast Treatments)

This product may be applied to pastures to suppress competitive growth and seed production of annual weeds and undesirable vegetation in pastures. For selective applications with broadcast spray equipment, apply 8 to 11 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. Use of higher application rates will cause stand reductions. No waiting period is required between application and grazing or harvesting for feed. Do not apply more than 2 quarts of this product per acre per year onto pasture grasses except for renovation uses as described previously in this section.

9.0 WEEDS CONTROLLED

Always use the higher rate of this product per acre within the specified range when weed growth is heavy or dense or weeds are growing in an undisturbed (noncultivated) area.

Reduced results may 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 rates to control 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, this product may be used at 4 to 7 quarts per acre for enhanced results.

9.1 Annual Weeds

Use 22 fluid ounces of this product per acre if weeds are less than 6 inches in height or runner length and 1.0 to 2.7 quarts of this product per acre if weeds are over 6 inches in height or runner length or when weeds are growing under stressed conditions. Use the higher rate for tough-to-control species regardless of the weed size at application. Treat tough-to-control weeds early when they are relatively small. This product may be tank mixed provided the tank-mix product is labeled for application at the target site. Refer to the individual tank mix product labels for approved sites and application rates.

For spray-to-wet applications, apply a 0.4-percent solution of this product to weeds less than 6 inches in height or runner length. For annual weeds over 6 inches tall, or for smaller weeds growing under stressed conditions, use a 0.7- to 1.5-percent solution. Use the higher rate for tough-to-control species or for weeds over 24 inches tall. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds.

For low volume directed spray applications, use a 4- to 7-percent solution of this product. Spray coverage should be uniform with at least 50 percent of the foliage contacted. Coverage of the top one half of the plant is important for best results. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Weed Species

Anoda, spurred
Barley
Barnyardgrass
Bassia, fivehook
Bittercress
Black nightshade
Bluegrass, annual
Bluegrass, bulbous
Brome, downy
Brome, Japanese

Browntop panicum
 Buttercup
 Carolina foxtail
 Carolina geranium
 Castorbean
 Cheatgrass
 Cheeseweed (*Malva parviflora*)
 Chervil
 Chickweed
 Cocklebur
 Copperleaf, hophornbeam
 Corn
 Corn speedwell
 Crabgrass
 Dwarf dandelion
 Eastern mannagrass
 Eclipta
 Fall panicum
 Falsedandelion
 Falseflax, smallseed
 Fiddleneck
 Field pennycress
 Filaree
 Fleabane, annual
 Fleabane, hairy (*Conyza bonariensis*)
 Fleabane, rough
 Florida pusley
 Foxtail
 Goatgrass, jointed
 Goosegrass
 Grain sorghum (milo)
 Groundsel, common
 Hemp sesbania
 Henbit
 Horseweed/Marestail (*Conyza canadensis*)
 Itchgrass
 Johnsongrass, seedling
 Junglerice
 Knotweed
 Kochia
 Lamb's-quarters
 Little barley
 London rocket
 Mayweed
 Medusahead
 Morningglory (*Ipomoea spp*)
 Mustard, blue
 Mustard, tansy
 Mustard, tumble
 Mustard, wild
 Oats
 Pigweed
 Plains/Tickseed coreopsis
 Prickly lettuce

Puncturevine
Purslane, common
Ragweed, common
Ragweed, giant
Red rice
Russian thistle
Rye
Ryegrass
Sandbur, field
Shattercane
Shepherd's-purse
Sicklepod
Signalgrass, broadleaf
Smartweed, ladythumb
Smartweed, Pennsylvania
Sowthistle, annual
Spanishneedles
Speedwell, purslane
Sprangletop
Spurge, annual
Spurge, prostrate
Spurge, spotted
Spurry, umbrella
Starthistle, yellow
Stinkgrass
Sunflower
Teaweed/Prickly sida
Texas panicum
Velvetleaf
Virginia copperleaf
Virginia pepperweed
Wheat
Wild oats
Witchgrass
Woolly cupgrass
Yellow rocket

9.2 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 specified range.

Ensure thorough coverage when using spray-to-wet treatments with hand-held equipment. For best results, use a 1.5-percent solution on harder-to-control perennials such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

For low volume directed spray applications, use a 4- to 7-percent solution of this product. Spray coverage should be uniform with at least 50 percent of the foliage contacted. Coverage of the top one half of the plant is important for best results. To ensure adequate spray coverage, spray both sides of large or tall weeds when foliage is thick and dense or where there are multiple sprouts.

Allow 7 or more days after application before tillage.

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Weed Species	Rate (QT/A)	Hand-Held % Solution
Alfalfa*	1 - 1.5	1.5
Alligatorweed*	3	1
Anise (fennel)	1.3 - 2.7	1 - 1.5
Bahiagrass	2 - 3.3	1.5
Beachgrass, European (<i>Ammophila arenaria</i>)	--	3.5
Bentgrass*	1	1.5
Bermudagrass	3.3	1.5
Bermudagrass, water (knotgrass)	1	1.5
Bindweed, field	2.7 - 3.3	1.5
Bluegrass, Kentucky	1.5	1.5
Blueweed, Texas	2.7 - 3.3	1.5
Brackenfern	2 - 3	1
Bromegrass, smooth	1.5	1.5
Bursage, woolly-leaf	--	1.5
Canarygrass, reed	1.5 - 2	1.5
Cattail	2 - 3.3	1.5
Clover; red, white	2 - 3.3	1.5
Cogongrass	2 - 3.3	1.5
Dallisgrass	2 - 3.3	1.5
Dandelion	2 - 3.3	1.5
Dock, curly	2 - 3.3	1.5
Dogbane, hemp	2.5	1.5
Fescue (except tall)	3	1.5
Fescue, tall	2	1.5
German ivy	1.3 - 2.7	1 - 1.5
Guineagrass	2	1
Horsenettle	2 - 3.3	1.5
Horseradish	3	1.5
Iceplant	1.3	1.5 - 2
Jerusalem artichoke	2 - 3.3	1.5
Johnsongrass	1.3 - 2	1
Kikuyugrass	1.5 - 2	1.5
Knapweed	3	1.5
Lantana	--	1
Lespedeza	2 - 3.3	1.5
Milkweed, common	2	1.5
Muhly, wirestem	1.5	1.5
Mullein, common	2 - 3.3	1.5
Napiergrass	2 - 3.3	1.5
Nightshade, silverleaf	1.5	1.5
Nutsedge; purple, yellow	2	1 - 1.5
Orchardgrass	1.5	1.5
Pampasgrass	2 - 3.3	1 - 1.5
Paragrass	2 - 3.3	1.5

Pepperweed, perennial	2.7	1.5
Phragmites*	2 - 3.3	1 - 1.5
Poison hemlock	1.3 - 2.7	1 - 1.5
Pokeweed, common	1	1.5
Quackgrass	1.3 - 2	1.5
Redvine*	1.5	1.5
Reed, giant	2.7 - 3.3	1.5
Ryegrass, perennial	1.5 - 2	1
Smartweed, swamp	2 - 3.3	1.5
Sowthistle, perennial	1.5 - 2	1.5
Spurge, leafy*	--	1.5
Starthistle, yellow	1.5	1.5
Sweet potato, wild*	--	1.5
Thistle, artichoke	1.3 - 2	1 - 1.5
Thistle, Canada	1.5 - 2	1.5
Timothy	1.5 - 2	1.5
Torpedograss*	2.7 - 3.3	1.5
Trumpetcreeper*	1.5 - 2	1.5
Vaseygrass	2 - 3.3	1.5
Velvetgrass	2 - 3.3	1.5
Wheatgrass, western	1.5 - 2	1.5

* Partial control

9.3 Woody Brush and Trees

Apply this product after full leaf expansion, unless otherwise directed on this label, or in separate supplemental labeling or Fact Sheets published by Monsanto Company for this product. 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.

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.

For best results when using hand-held equipment, use a 1.5-percent solution on harder-to-control woody brush and trees.

For low volume directed-spray applications, apply a 4- to 7-percent solution of this product. Spray coverage should be uniform with at least 50-percent of the foliage contacted. Coverage of the top one-half of the plant is important for best results. 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 spouts.

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	1

Ash*	1.5 - 3.3	1 - 1.5
Aspen, quaking	1.5 - 2	1
Bearclover (Bearmat)*	1.5 - 3.3	1 - 1.5
Beech*	1.5 - 3.3	1 - 1.5
Birch	1.5 - 2	1
Blackberry	2 - 3	1
Blackgum	1.5 - 3.3	1 - 1.5
Bracken	1.5 - 3.3	1 - 1.5
Broom; French, Scotch	1.3 - 3.3	1 - 1.5
Buckwheat, California*	1.3 - 2.5	1 - 1.5
Cascara*	1.5 - 3.3	1 - 1.5
Catsclaw*	--	1
Ceanothus*	1.5 - 3.3	1 - 1.5
Chamise*	1.3 - 3.3	1
Cherry; bitter, black, pin	1.5 - 2	1
Coyote brush	2 - 2.7	1 - 1.5
Deerweed	1.3 - 3.3	1
Dogwood*	1.5 - 3.3	1 - 1.5
Elderberry	1.5 - 2	1
Elm*	1.5 - 3.3	1 - 1.5
Eucalyptus	--	1.5
Gorse*	1.5 - 3.3	1 - 1.5
Hasardia*	1.3 - 2.5	1 - 1.5
Hawthorn	1.5 - 2	1
Hazel	1.5 - 2	1
Hickory*	1.5 - 3.3	1 - 1.5
Honeysuckle	2 - 3	1
Hornbeam, American*	1.5 - 3.3	1 - 1.5
Kudzu	2.5 - 3	1.5
Locust, black*	1.5 - 2.5	1 - 1.5
Madrone resprouts*	--	1.5
Manzanita*	1.5 - 3.3	1 - 1.5
Maple, red	1.5 - 3	1
Maple, sugar	--	1
Monkey flower*	1.3 - 2.7	1 - 1.5
Oak; black, white*	1.5 - 3	1 - 1.5
Oak, post	2 - 3	1
Oak; northern, pin	1.3 - 2.7	1
Oak, Scrub*	1.3 - 2.7	1
Oak; southern red	1.5 - 2	1
Peppertree, Brazilian (Florida holly)*	1.3 - 3.3	1 - 1.5
Persimmon*	1.5 - 3.3	1 - 1.5
Pine	1.5 - 3.3	1 - 1.5
Poison ivy	2.5 - 3.3	1.5
Poison oak	2.5 - 3.3	1.5
Poplar, yellow*	1.5 - 3.3	1 - 1.5

Redbud, eastern	1.5 - 3.3	1 - 1.5
Rose, multiflora	1.5	1
Russian olive*	1.5 - 3.3	1 - 1.5
Sage, black	1.3 - 2.7	1
Sage, white*	1.5 - 2.7	1 - 1.5
Sage brush, California	1.3 - 2.7	1
Salmonberry	1.5 - 2	1
Saltcedar*	1.5 - 3.3	1 - 1.5
Sassafras*	1.5 - 3.3	1 - 1.5
Sourwood*	1.5 - 3.3	1 - 1.5
Sumac; laurel, poison, smooth, sugarbush, winged*	1.5 - 3	1 - 1.5
Sweetgum	1.5 - 2	1
Swordfern*	1.5 - 3.3	1 - 1.5
Tallowtree, Chinese	--	1
Tan oak resprouts*	--	1.5
Thimbleberry	1.5	1
Tobacco, tree*	1.5 - 2.5	1 - 1.5
Toyon*	--	1.5
Trumpetcreeper	1.5 - 2	1
Vine maple*	1.5 - 3.3	1 - 1.5
Virginia creeper	1.5 - 3.3	1 - 1.5
Waxmyrtle, southern*	1.5 - 3.3	1 - 1.5
Willow	2 - 3	1
Yerbasenta*	--	1.5

* Partial control

10.0 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. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, 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.

To the extent consistent with applicable law, 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 to the extent consistent with applicable law, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, failure of this product to control weed biotypes which develop resistance to glyphosate, 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.

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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.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, 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 EXTENT CONSISTENT WITH APPLICABLE 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.

[INSERT BRAND NAME], Outrider, Monsanto and Vine symbol are trademarks of Monsanto Technology LLC.

All other trademarks are the property of their respective owners.

This product is protected by U.S. Patent No's. 5,668,085 and 6,365,441. Other patents pending. No license granted under any non-U.S. patent(s).

EPA Reg. No. 524-579

In case of an emergency involving this product, or for medical assistance,
Call Collect, day or night, (314) 694-4000.

© [DATE]
Packed For:
MONSANTO COMPANY
800 N. Lindbergh Blvd.
ST. LOUIS, MISSOURI, 63167 USA

APPENDIX 1 – Consolidated List of Label Claims

Rainfast in 15 Minutes
 Rainfast in 30 Minutes
 Rainfast in 45 Minutes
 Rainfast in 60 Minutes
 Rainproof in 15 Minutes
 Rainproof in 30 Minutes
 Rainproof in 45 Minutes
 Rainproof in 60 Minutes
 15-Minute Rainfastness
 30-Minute Rainfastness
 45-Minute Rainfastness
 60-Minute Rainfastness
 First New Formula in over 30 years
 First New Formula in 33 years
 Treats 50% more area
 50% more concentrated
 Brand Advantage
 Performance Guarantee
 Performance Guaranteed
 Guaranteed Performance
 Faster Symptoms
 Faster physical symptoms
 Faster results
 Faster control of weeds
 3 Times Faster
 4 Times Faster
 5 Times Faster
 3 Times More to the Root
 4 Times More to the Root
 5 Times More to the Root
 See Results 3x Faster
 See Results 4x Faster
 See Results 5x Faster
 Works 3x Faster
 Works 4x Faster

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Works 5x Faster
More Consistent performance
NEW

IV. SUPPLEMENTAL LABELING FOR INDUSTRIAL, TURF, & ORNAMENTAL USES

Table of Contents: Industrial, Turf, and Ornamental Supplemental labeling

	Name	1 st Approval Date
	TEMPLATE FOR SUPPLEMENTAL LABELS AND STANDARD LANGUAGE	20 June 2007
A	FOR USE FOR SELECTIVE WEED CONTROL ON [INSERT BRAND NAME] TOLERANT PURE GOLD® TALL FESCUE AND AURORA GOLD® FINE FESCUE SELECTIONS.	20 June 2007
B	AERIAL APPLICATIONS IN CALIFORNIA	20 June 2007
C	TANK MIXES FOR IMPROVED CONTROL OF BENTGRASS (Agrostis spp.)	20 June 2007
D	TANK MIXTURES FOR TOUGH TO CONTROL WEEDS	11/1/07
E	ALTERNATE INGREDIENT STATEMENT	11/1/07

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SUPPLEMENTAL LABELING

READ THE ENTIRE LABEL FOR **[INSERT BRAND NAME]** BEFORE PROCEEDING WITH THE USE DIRECTIONS CONTAINED IN THIS SUPPLEMENTAL LABELING.

When using **[INSERT BRAND NAME]** as permitted according to this supplemental labeling, read and follow all applicable directions, restrictions, and precautions on the label booklet provided with the pesticide container and on this supplemental labeling. This supplemental labeling must be in the possession of the user at the time of pesticide application.

[INSERT BRAND NAME]

Herbicide

EPA Reg. No. 524-579

Keep out of reach of children.

CAUTION!

In case of an emergency involving this product, Call Collect, day or night, 314-694-4000.

[INSERT BRAND NAME] is a registered trademark of Monsanto Technology LLC.

DIRECTIONS FOR USE

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

This labeling must be in the possession of the user at the time of herbicide application.

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.

See "GENERAL INFORMATION" and "MIXING" sections of the label booklet for **[INSERT BRAND NAME]** for essential product performance information.

[INSERT SPECIFIC DIRECTIONS FOR USE FROM FOLLOWING SECTIONS HERE]

Read the "Limit of Warranty and Liability" in the label booklet for **[INSERT BRAND NAME]** before using. These terms apply to this supplemental labeling and if these terms are not acceptable, return the product unopened at once.

© [DATE] MONSANTO COMPANY
ST. LOUIS, MISSOURI 63167 USA

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A. LIMITATIONS ON AERIAL APPLICATION IN CALIFORNIA ONLY, INCLUDING FRESNO COUNTY, CALIFORNIA

DIRECTIONS FOR USE

All labeled treatments may be made by aerial equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this supplemental labeling and in the product label booklet. Refer to Aerial Equipment in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of the product label for additional information. Refer to the individual use site section of the product label, or to other supplemental labeling or technical fact sheets published separately for this product by Monsanto, for specific use instructions.

AVOID DRIFT—DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop, and/or near other desirable vegetation or annual crops.

1. Do not apply within 100 feet of all desirable vegetation or crop(s).
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

When applied as directed, under the conditions described, this product controls annual and perennial weeds listed in the label booklet.

When tank-mixing this product with 2,4-D, only 2,4-D amine formulations may be used for aerial application in California. Tank mixtures with 2,4-D amine formulations may be applied by air in California for fallow and reduced tillage systems, and for alfalfa and pasture renovation applications only.

This product, when tank-mixed with dicamba, may not be applied by air in California.

ADDITIONAL INFORMATION FOR FRESNO COUNTY, CALIFORNIA

The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:

North: Fresno County line

South: Fresno County line

East: State Highway 99

West: Fresno County line

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Recommendations

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A written recommendation **MUST** be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written recommendation **MUST** state the proximity of surrounding crops, and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night—Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

To report known or suspected misuse of this product, call 1-800-332-3111.

For additional information on the proper aerial application of this product, call 916-784-1718.

B. FOR USE FOR SELECTIVE WEED CONTROL ON [INSERT BRAND NAME] TOLERANT PURE GOLD® TALL FESCUE AND AURORA GOLD® FINE FESCUE SELECTIONS

DIRECTIONS FOR USE

[INSERT BRAND NAME] Tolerant Tall Fescue Selections For Seed Production

Use this product on **[INSERT BRAND NAME]** tolerant tall and fine fescue grown for seed production only.

This product may be applied at rates of 2.5 to 9 fluid ounces per acre as a postemergence spray on **[INSERT BRAND NAME]** tolerant tall fescue selections. See the label booklet for application instructions, rate recommendations, weeds controlled and proper growth stage of weeds.

When applied postemergence, this product will control or suppress the following weeds: annual bluegrass mustards, downy brome, cheatgrass, chickweed, pennycress, fleabane, shepherd's-purse, sowthistle, wild oat, dandelion, quackgrass, and Canada thistle. See the **[INSERT BRAND NAME]** label booklet for a complete list of weeds controlled or suppressed.

NOTE: The recommended rate for this use will limit the level of control of certain species of weeds.

NOTE: Some crop discoloration and yellowing may occur at higher rates of application with **INSERT BRAND NAME]** tolerant tall and fine fescue selections. Reduction in stand of these selections may occur under stress conditions.

Timing Of Applications

Applications can be made 6 weeks after germination and to established crops after growth resumes in the Fall until onset of dormancy and in the Spring after dormancy break until 60 days prior to harvest.

Avoid spraying during or within two weeks after periods when air temperatures fall below 25°F.

Remove domestic livestock from the seed production field prior to application. Wait 60 days after making this application before grazing or harvesting the treated area.

NOTE: Only two applications per crop growth cycle may be made to any one site. If two applications are required, only one Fall and one Spring application may be made during one 12 month cycle.

C. TANK MIXTURES FOR IMPROVED CONTROL OF BENTGRASS (*Agrostis* spp.)

DIRECTIONS FOR USE

[INSERT BRAND NAME] herbicide may be tank mixed with the products listed below for improved control of bentgrass (*Agrostis* spp.). When tank mixing, read and carefully observe label directions, cautionary statements and all information on the labels of each product used. Refer to each individual product label for approved use sites.

ENVOY®	FUSILADE® II
FUSION®	VANTAGE®

Dry ammonium sulfate, at 1 to 2 percent by weight, may be added to the spray solution for the above applications. The equivalent rate of ammonium sulfate in a liquid formulation may also be used. Ensure that ammonium sulfate is completely dissolved in the spray tank before adding herbicides. Thoroughly rinse the spray system with clean water after use to reduce corrosion.

Broadcast Treatment

- Apply 1.6 to 2.2 quarts per acre of this product plus 34 fluid ounces per acre of **Envoy** in 20 to 40 gallons per acre of spray solution.
- Apply 1.6 to 2.2 quarts per acre of this product plus 24 fluid ounces per acre of **Fusilade II** in 20 to 40 gallons per acre of spray solution.
- Apply 1.6 to 2.2 quarts per acre of this product plus 60 fluid ounces per acre of **Vantage** in 20 to 40 gallons per acre of spray solution.
- Apply 1.6 to 2.2 quarts per acre of this product plus 9 fluid ounces per acre of **Fusion** in 20 to 40 gallons per acre of spray solution.

Re-treatment may be needed in the event of incomplete control.

Spot Treatment

- Mix 1.5 fluid ounces of this product with 1.3 fluid ounces of **Envoy** in one gallon of water and spray-to-wet.
- Mix 1.5 fluid ounces of this product with 0.75 fluid ounces of **Fusilade II** in one gallon of water and spray-to-wet.
- Mix 1.5 fluid ounces of this product with 3 fluid ounces of **Vantage** in one gallon of water and spray-to-wet.
- Mix 1.5 fluid ounces of this product with 0.25 fluid ounces of **Fusion** in one gallon of water and spray-to-wet.

ATTENTION: AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

D. TANK MIXTURES FOR TOUGH TO CONTROL WEEDS

[INSERT INTO SUPPLEMENTAL LABEL TEMPLATE AS INDICATED]

DIRECTIONS FOR USE

Use in areas such as airports, apartment complexes, Christmas tree farms, commercial sites, ditch banks, dry ditches, dry canals, fencerows, golf courses, greenhouses, industrial sites, landscape areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parks, parking areas, pastures, petroleum tank farms and pumping installations, plant nurseries, public areas, railroads, rangeland, recreational areas, residential areas, rights-of-way, roadsides, schools, sod or turf seed farms, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas, and wildlife management areas.

See "GENERAL INFORMATION" and "MIXING" sections of the label booklet for [INSERT BRAND NAME] for essential product performance information.

Do not allow spray mixtures of this herbicide to mist, drip, drift or splash onto desirable vegetation since injury or destruction may occur. Do not apply when wind or other conditions favor drift.

See the "WEEDS CONTROLLED" section of the [INSERT BRAND NAME] label booklet for specific rates. For tough to control species, where dense stands occur, or where conditions for control are not ideal, 4 to 7 quarts per acre of this product can be used for improved results.

TANK MIXTURES

This product provides control of the emerged weeds listed in the label booklet. 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.

The following list of products may be tank mixed with this product, provided that the specific product is registered for application to the target site. Any labeled rate of this product may be used in a tank mixture with these products. Refer to these product labels for approved sites and application rates.

2,4-D ¹	Krovar I DF
Arsenal	Landmark II MP
atrazine ¹	Landmark MP
Barricade 65WG	Landmark XP
Crossbow L	Milestone
dicamba ¹	
diuron ¹	Oust XP
Endurance	Outrider
Escort	Overdrive
Escort XP	pendimethalin ¹
Gallery 75 DF	Plateau
Garlon 3A	Plateau DG
Garlon 4	Poast
Goal 2XL	Quicksilver
Hyvar X	Ronstar 50 WSP
Hyvar X-L	Sahara DG
Krenite	simazine ¹

Spike 80DF
Surflan AS
Surflan WDG
Telar DF

Transline
Velpar DF
Velpar L

¹ Tank mixtures with products containing this generic active ingredient may be made provided the specific product is registered for this use.

Refer to the individual product labels for specific sites, rates, carrier volumes and precautionary statements.

Read and carefully observe the label claims, cautionary statements, use rates and all other information on the labels of all products used in these tank mixtures. Use according to the most restrictive precautionary statements for each product in the mixture.

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.

When used in combination as directed 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.

Outrider is a trademark of Monsanto Technology LLC. All other trademarks are the property of their respective owners.

E. ALTERNATE INGREDIENT STATEMENT

[INSERT INTO SUPPLEMENTAL LABEL TEMPLATE AS INDICATED]

INGREDIENTS:

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its potassium salt..... 48.7%

OTHER INGREDIENTS (including 8.8% surfactant):.....51.3%
100.0%

*Contains 660 grams per liter or 5.5 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its potassium salt. Equivalent to 540 grams per liter or 4.5 pounds per U.S. gallon of the acid, glyphosate.

Product Description: This product is a postemergence, systemic herbicide with no soil residual activity. It gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid containing 8.8 percent surfactant and no additional surfactant is needed or recommended.

LIST OF CHANGES THIS SUBMISSION

- Update Storage and Disposal Section for compliance with the Container Containment Rule and PR Notice 2007-4.
- Incorporate hollow stem injection supplemental label approved November 1, 2007
- General updates for clarification and consistency with previously approved glyphosate product labels
- Deleted references to Oust to only reference Oust XP as Oust is no longer marketed

524-579

7/1/2009

1/3



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
TOXIC SUBSTANCES

AND

JUL 1 - 2009

Ms. Dawn Fee-White
Monsanto Company,
1300 I (Eye) Street, N.W., Suite 450 East
Washington, DC 2005

Dear Ms. Fee-White:

Subject: Roundup Pro Max Herbicide (Foliar and Broadcast Treatment of Japanese Knotweed and Oriental Bittersweet)
EPA Registration No. 524-579
Application Dated April 2, 2009

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act as amended is acceptable. A stamped copy of labeling is enclosed for your records.

Sincerely,

James A. Tompkins for
James A. Tompkins
Product Manager 25
Herbicide Branch
Registration Division (7505P)

SUPPLEMENTAL LABELING

READ THE ENTIRE LABEL FOR **ROUNDUP PROMAX™ HERBICIDE** BEFORE PROCEEDING WITH THE USE DIRECTIONS CONTAINED IN THIS SUPPLEMENTAL LABELING.

When using Roundup PROMAX Herbicide as permitted according to this supplemental labeling, read and follow all applicable directions, restrictions, and precautions on the label booklet provided with the pesticide container and on this supplemental labeling. This supplemental labeling must be in the possession of the user at the time of pesticide application.

ROUNDUP PROMAX™ HERBICIDE LOGO

For Foliar and Broadcast Treatment of Japanese Knotweed &
Oriental Bittersweet

EPA Reg. No. 524-579

Roundup PROMAX is a trademark of Monsanto Technology LLC.

Keep out of reach of children.

CAUTION!

In case of an emergency involving this product,
Call Collect, day or night, (314) 694-4000.

DIRECTIONS FOR USE

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

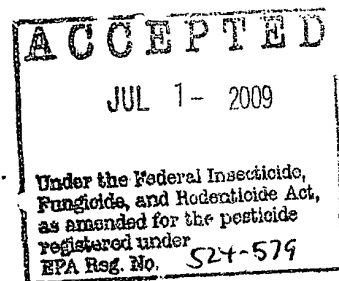
This label must be in the possession of the user at the time of the herbicide application.

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.

See the "GENERAL INFORMATION", "MIXING AND APPLICATION INSTRUCTIONS" and "AQUATIC AND OTHER NON-CROP SITES" sections of the label booklet for Roundup PROMAX herbicide for essential product performance information. See the "WEEDS CONTROLLED" section of the label booklet for Roundup PROMAX herbicide for optimum stage of treatment of weed for best results.

JAPANESE KNOTWEED

For control of Japanese knotweed (*Polygonum cuspidatum*), this product may be applied as a 2.0% v/v spray-to-wet solution. Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.



For broadcast applications, apply 3.25 quarts of this product in 3 to 40 gallons per acre as a broadcast treatment.

Late summer or fall application is ideal, while leaves are still green and after fruit formation.

ORIENTAL BITTERSWEET

For control of Oriental bittersweet (*Celastrus orbiculatus*), this product may be applied as a 1.5% v/v spray-to-wet solution. Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.

For broadcast applications, apply 2 quarts of this product in 3 to 40 gallons per acre as a broadcast treatment.

Late summer or fall application is ideal, while leaves are still green and after fruit formation.

WARRANTY AND LIABILITY

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 directly caused by the inclusion of the Monsanto product in such combination use.

Read the "LIMIT OF WARRANTY AND LIABILITY" in the label booklet for Roundup PROMAX herbicide before buying or using this product. Those terms apply to this supplemental labeling and if those terms are not acceptable, return the product unopened at once.

© 2009 MONSANTO COMPANY
800 N. Lindbergh Blvd.
St. Louis, Missouri, 63167 U.S.A.

[Print Plate] [Approval date]

Exhibit 20

524-517

1/25/2010

10f44



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

1-25-11

Dawn Fee-White
Monsanto Company
1300 I (Eye) Street, NW
Suite 450 East
Washington, DC 20005

Subject: EPA Reg. No. 524-517 / Ranger Pro Herbicide Label Amendment

The labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, is acceptable.

A stamped copy of the label is enclosed for your records. If you have any questions please call Erik Kraft at 703-308-9358 or email at Kraft.Erik@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Erik Kraft", written over the typed name.

James A. Tompkins
Product Manager 25
Herbicide Branch
Registration Division (7505P)

2 of 44

21225H4-1/53

Ranger[®] PRO Herbicide

Ranger PRO is a complete broad-spectrum postemergence professional herbicide for non-crop, industrial, Turf and ornamental weed control.

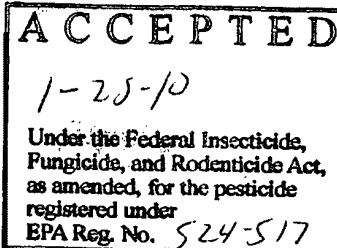
Complete Directions for Use

~~The complete broad-spectrum postemergence professional herbicide for industrial, turf and ornamental weed control.~~

EPA Reg. No. 524-517

2009-1

**AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS,
EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS,
DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY
OR DESTRUCTION IS LIKELY TO RESULT.**



Base Brand Name:
RangerPRO Herbicide

Table of Contents for Master Label

I	Main Label for Industrial, Turf, & Ornamental Uses	Page 2
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****See each label part for more detailed table of contents****

All AG Crop uses and crop use supplemental labels previously on this registration have been removed. Ag non-crop uses are incorporated.

I. MAIN LABEL FOR INDUSTRIAL, TURF, ORNAMENTAL USES

[INSERT PRODUCT LOGO]



Ranger PRO herbicide is a complete broad-spectrum postemergence professional herbicide for industrial, turf and ornamental weed control.

Optional alternate statement: Ranger PRO herbicide is a complete broad-spectrum postemergence professional herbicide for forestry site preparation and utility rights-of-way weed control.

Complete Directions for Use

EPA Reg. No. 524-517

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION IS LIKELY TO RESULT.

Read the entire label before using this product.

Use only according to label instructions.

Not all products listed in 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 (THIS COMPANY) DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

[Container label text for Refillable Container Label Statement]

THIS IS AN END-USE PRODUCT. MONSANTO (THIS COMPANY) DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION. IT IS INTENDED THAT REPACKAGING BE ONLY IN ACCORDANCE WITH A MONSANTO (VALID) REPACKAGING OR TOLL REPACKAGING AGREEMENT.

[Container label text for Non-Refillable Container Label Statement]

THIS IS AN END-USE PRODUCT. MONSANTO (THIS COMPANY) DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING

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1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt.....41.0%

OTHER INGREDIENTS (including surfactant): 59.0%

100.0%

*Contains 480 grams per liter or 4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 356 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.

This product is protected by U.S. Patent Nos. 5,683,958; 5,703,015; 6,063,733; 6,121,199; 6,121,200. No license granted under any non-U.S. patent(s).

2.0 IMPORTANT PHONE NUMBERS

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I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

1. FOR PRODUCT INFORMATION OR ASSISTANCE IN USING THIS PRODUCT, CALL TOLL-FREE,
1-800-332-3111.
2. 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!

CAUSES EYE IRRITATION.

Avoid contact with eyes or clothing.

FIRST AID:	Call a poison control center or doctor for treatment advice.
IF IN EYES	<ul style="list-style-type: none">• 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.
<ul style="list-style-type: none">• Have the product container or label with you when calling a poison control center or doctor, or going for treatment.• You may also contact (314) 694-4000, collect day or night, for emergency medical treatment information.• This product is identified as [INSERT BRAND NAME], EPA Registration No. 524-517.	

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 Personal Protective Equipment. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

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.

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

3.2 Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

3.3 Physical or Chemical Hazards

Mix, store and apply spray solutions of this product 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 *[insert company name]* Supplemental Labeling or Fact Sheets. Supplemental labeling can be found on the Internet at www.cdms.net or www.greenbook.net websites or obtained by contacting your Authorized Monsanto *[insert company name]* Retailer or Monsanto Company *[insert company name]* 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, is: coveralls, chemical resistant gloves greater than 14 mils in thickness composed of materials such as butyl rubber, natural rubber, neoprene rubber, or nitrile rubber, shoes plus socks.

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 (40 CFR Part 170) for agricultural pesticides. 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 to prevent transfer of this product onto desirable vegetation.

4.0 STORAGE AND DISPOSAL

[FOR RIGID PLASTIC 2.5 GAL CONTAINERS OR OTHERS ≤ 5 GAL]

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

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 or disposal.

PESTICIDE STORAGE: Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination. *[Alternate language]* Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Keep container closed to prevent spills and contamination.

PESTICIDE DISPOSAL: To avoid wastes, use all material in this container, including rinsate, by application in accordance with 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 procedures

CONTAINER DISPOSAL:

Nonrefillable container. Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in this container. Contact your state regulatory agency to determine allowable practices in your state. *[Alternate language]* CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container.

CONTAINER HANDLING: 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 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.

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.

Once cleaned, some (optional: agricultural) plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-768-6387. If recycling is not available, puncture and dispose of in a sanitary landfill.

[Alternate disposal statement: Offer container for recycling, if available, or puncture and dispose of in a sanitary landfill.]

[FOR RIGID PLASTIC 30 GAL CONTAINERS OR OTHERS > 5 GAL]

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 or disposal.

PESTICIDE STORAGE: Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination. *[Alternate language]* Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Keep container closed to prevent spills and contamination.

PESTICIDE DISPOSAL: To avoid wastes, use all material in this container, including rinsate, by application in accordance with 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 procedures

CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container.

[Alternate language] Nonrefillable container. Do not reuse this container to hold materials other

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in this container. Contact your state regulatory agency to determine allowable practices in your state.

CONTAINER HANDLING: 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 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.

Once cleaned, some (optional: agricultural) plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or Monsanto at 1-800-768-6387. If recycling is not available, puncture and dispose of in a sanitary landfill. [Alternate disposal statement: Offer container for recycling, if available, or puncture and dispose of in a sanitary landfill.]

[Optional Container Label Text] Return container to Monsanto for recycling. Contact 1-800-768-6387.

[Container label language for transport vehicles as defined in 40 CFR §156.3]

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 or disposal.

PESTICIDE STORAGE: 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, empty as much product from this transport vehicle as possible for repackaging or use in accordance with 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.

CONTAINER DISPOSAL: Emptied container retains vapor and product residue. Observe all precautions stated on this label until the container is cleaned, reconditioned or destroyed.

CONTAINER HANDLING: Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, and worn-out threads and closures. Clean thoroughly before reuse for transportation of a material of different composition or before retiring this transport vehicle from service.

5.0 PRODUCT INFORMATION

Product Description: This product is a postemergence, 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 containing surfactant and no additional surfactant is needed or recommended. It may be applied through standard equipment after dilution and mixing with water or other carriers according to label instructions.

Optional alternate statement: It is formulated as a water-soluble liquid containing [X.X percent] surfactant and no additional surfactant is needed or recommended.

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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" sections 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 an enzyme found only in plants and microorganisms that is essential to formation of specific amino acids.

Cultural Considerations: Reduced control may 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 recommended 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 control.

Spray Coverage: For best results, ensure spray coverage is 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 10.6 quarts of this product (10.6 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.

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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
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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 good weed management practices:

- Scout your application site before and after herbicides 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.
- Utilize the label rate for the most difficult weed in the site. Avoid tank-mixtures with other herbicides that reduce this product's efficacy (through antagonism) or tank mixtures which encourage rates of this product below the labeled amounts.
- 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 *[insert company name]* representative, local retailer, or county extension agent.

5.2 Management for Glyphosate Resistant Weed Biotypes

NOTE: Appropriate testing is critical in order to confirm weed resistance to glyphosate. Contact your Monsanto *[insert company name]* representative to determine if resistance has been confirmed to any particular weed biotype in your area. Control instructions for biotypes confirmed as 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 *[insert company name]* representative.

Since the occurrence of new glyphosate resistant weeds cannot be determined until after product use and scientific confirmation, Monsanto Company *[insert company name]* 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 encouraged 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

Mix, store and apply spray solutions of this product using only clean stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

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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 immediately after using this product by thoroughly flushing with water.

NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

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 may 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. 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 describes 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 identified on this label may result in reduced performance.

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 labeled amount of this product.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation may be 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.

Refer to the "Tank Mixtures" section for additional precautions.

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

Amount of [INSERT BRAND NAME]

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Desired Volume	1/2%	1%	1-1/2%	2%	5%	10%
1 gal	2/3 oz	1-1/3 oz	2 oz	2-2/3 oz	6-1/2 oz	13 oz
25 gal	1 pt	1 qt	1-1/2 qt	2 qt	5 qt	10 qt
100 gal	2 qt	1 gal	1-1/2 gal	2 gal	5 gal	10 gal

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, it is suggested that the labeled amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

Optional Section:**Surfactants**

Nonionic surfactants which are labeled for use with herbicides may be used. Do not reduce rates of this product when adding surfactant. When adding additional surfactant, use 0.5 percent surfactant concentration (2 quarts per 100 gallons of spray solution) when using surfactants which contain at least 70 percent active ingredient or a 1 percent surfactant concentration (4 quarts per 100 gallons of spray solution) for those surfactants containing less than 70 percent active ingredient. Read and carefully observe surfactant cautionary statements and other information appearing on the surfactant label.

6.5 Colorants or Dyes

Approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilution. Use colorants or dyes according to the manufacturer's instructions.

6.6 Drift Control Additives

Drift reduction additives may 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 VEGETATION.

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 determine the potential for spray drift. The applicator and/or the grower is 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, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

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TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Avoid direct application to any body of water.

Use the labeled rates of this herbicide in 3 to 25 gallons of water per acre.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations that dispense spray as fine spray droplets. Do not angle nozzles forward into the air stream and do not increase spray volume by increasing nozzle pressure. Drift control additives may be used. When a drift control 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.

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 Inversion** 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 labeled 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.

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- **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 increases 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 must 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 must be familiar with local wind patterns and how they affect 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, 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

Apply 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 [this company]. *(Optional statement: Use the labeled rates of this product in 10 to 60 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 [this company])* As density of weeds increases, increase spray volume within the labeled 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 for even distribution of spray droplets.

7.3 Backpack or High-Volume Equipment

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, ensure spray coverage is uniform and complete. Do not spray to the point of runoff. Use coarse sprays only.

Refer to the "Annual Weeds" instructions of "WEEDS CONTROLLED" section for specific rates and restrictions **7.4 Selective Equipment**

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This product may be diluted with water and applied through recirculating spray systems, shielded applicators, hooded sprayers, wiper applicators or sponge bars, to listed weeds growing in any site specified on this label.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION. Contact of this product with desirable vegetation may result in unwanted plant damage or destruction. **Recirculating Spray**

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.

Adjust application equipment used above desired vegetation to 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. **EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

Wiper Applicators and Sponge Bars

A wiper or sponge applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution. 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 product performance may result from the use of solutions held in storage. Clean wiper parts immediately after using this product by thoroughly flushing with water.

For Rope or Sponge Wick Applicators: Solutions ranging from 33 to 75 percent of this product in water may be used.

For Panel Applicators and pressure-feed systems: Solutions ranging from 33 to 100 percent of this product in water may be used.

When applied as directed, this product **CONTROLS** the following weeds:

Corn, volunteer	Sicklepod
Panicum, Texas	Spanishneedles
Rye, common	Starbur, bristly
Shattercane	

When applied as directed, this product **SUPPRESSES** the following weeds:

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Beggarweed, Florida	Ragweed, common
Bermudagrass	Ragweed, giant
Dogbane, hemp	Smutgrass
Dogfennel	Sunflower
Guineagrass	Thistle, Canada
Johnsongrass	Thistle, musk
Milkweed	Vaseygrass
Nightshade, silverleaf	Velvetleaf
Pigweed, redroot	

7.5 Injection Systems

This product may 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 directed.

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 directed in this label when applied by conventional broadcast equipment. For vehicle-mounted CDA equipment, apply 2 to 15 gallons of water 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

Detailed instructions follow alphabetically, by site.

Unless otherwise specified on this label or in separate supplemental labeling or fact sheets published by Monsanto [this company], applications may be made to control any weeds listed in the annual, perennial and woody brush tables. Also refer to the "SELECTIVE EQUIPMENT" section.

8.1 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, make applications during periods of active growth and full leaf expansion.

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.

8.2 Forestry Site Preparation

This product is labeled for the control or partial control of woody brush, trees and herbaceous weeds in forestry sites. This product is also labeled for use in preparing or establishing wildlife openings within these sites and maintaining logging roads.

This product is labeled for use in site preparation prior to planting any tree species, including Christmas trees, eucalyptus, hybrid tree cultivars and silvicultural nursery sites.

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Use higher rates of this product within the labeled range for control or partial control of woody brush, trees and hard-to-control perennial herbaceous weeds. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop. Increase rates within the labeled range for control of perennial herbaceous weeds any time after emergence and before seedheads, flowers or berries appear.

Use the lower rates of this product within the labeled range for control of annual herbaceous weeds and actively growing perennial herbaceous weeds after seedheads, flowers or berries appear. Apply to the foliage of actively growing annual herbaceous weeds any time after emergence.

This product has no herbicidal or residual activity in the soil. Where repeat applications are necessary, do not exceed 10.6 quarts of this product per acre per year.

TANK MIXTURES: Tank mixtures of this product may be used to increase the spectrum of vegetation controlled. 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 may be used in a tank mix with the following products for forestry site preparation.

Arsenal Applicators Concentrate	Escort
Chopper	Garlon 3A
Chopper GEN2	Garlon 4
	Oust XP

For control of herbaceous weeds, use the lower labeled tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher labeled tank mixture rates.

Do not apply this product as an over-the-top broadcast spray for forestry conifer or hardwood release unless otherwise directed on this label or in separately published Monsanto [insert company name] supplemental labeling or fact sheets,

8.3 Non-Crop Areas and Industrial Sites

This product may be used in non-crop areas, airports, apartment complexes, commercial sites, ditch banks, driveways, dry ditches, dry canals, fencerows, forestry sites, golf courses, greenhouses, industrial sites, landscape areas, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parks, parking areas, petroleum tank farms and pumping installations, railroads, recreational areas, residential areas, rights-of-way, roadsides, schools, shadehouses, sports complexes, storage areas, substations, turfgrass areas, utility sites, warehouse areas, other public areas, and wildlife management sites.

This product may also be used in non-food crop sites, Christmas tree farms, plant nurseries, sod or turf seed farms.

Unless otherwise specified, applications may be made to control any weeds listed in the WEEDS CONTROLLED section of this label.

Weed Control, Trim-and-Edge, Bare Ground

This product may be used in non-crop and non-food crop areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around objects in non-crop sites, for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

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TANK MIXTURES: This product may be tank mixed with the following products provided that the specific product is labeled for application at the use site. Refer to the individual product labels for approved sites and application rates.

Arsenal	Plateau
Clarity	Princep DF
Barricade 65WG	Princep Liquid
Diuron	Ronstar 50WSP
Endurance	Sahara
Escort	simazine
Garlon 3A	Surflan
Garlon 4	Telar
Karmex	Vanquish
Krovar I DF	2,4-D
Oust XP	
Pendulum 3.3 EC	
Pendulum WDG	

This product plus dicamba tank mixtures may not be applied by air in California.

When applied as a tank mixture for bare ground, this product provides control of the emerged annual weeds and control or partial control of emerged perennial weeds, woody brush and trees.

For control or partial control of the following perennial weeds, apply 1 to 2 quarts of this product plus 2 to 8 ounces of Oust XP per acre.

Bahiagrass	Fescue, tall
Bermudagrass	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Quackgrass
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Chemical Mowing - Perennials

This product will suppress perennial grasses listed in this section to serve as a substitute for mowing. Use 8 fluid ounces of this product per acre when treating tall fescue, fine fescue, orchardgrass, quackgrass or reed canarygrass covers. Use 6 fluid ounces of this product per acre when treating Kentucky bluegrass. Apply treatments in 10 to 40 gallons of spray solution per acre.

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, annual ryegrass, wild barley and wild oats growing in coarse turf on roadsides or other industrial areas, apply 4 to 5 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Make applications 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.

Bromus Species and Medusahead in Pastures and Rangelands

Bromus species. This product may be used to treat downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), soft chess (*Bromus mollis*) and cheatgrass (*Bromus secalinus*) found in industrial, rangeland and pasture sites. Apply 8 to 16 fluid ounces of this product per acre on a broadcast basis.

For best results, coincide treatment with early seedhead emergence of the most mature plants. Delaying the application until this growth stage will maximize the emergence of other weedy grass flushes. Make

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applications to the same site each year until seed banks are depleted and the desirable perennial grasses can become reestablished on the site.

Medusahead. To treat medusahead, apply 16 fluid ounces of this product per acre as soon as plants are actively growing, and prior to the 4-leaf stage. Applications may be made in the fall or spring.

Applications to brome and medusahead may be made using ground or aerial equipment. Aerial applications for these uses may be made using fixed wing or helicopter equipment. For aerial applications, apply in 2 to 10 gallons of water per acre. For applications using ground equipment, apply in 10 to 20 gallons of water per acre. When applied as directed in this label, there are no grazing restrictions.

Dormant Turfgrass

This product may be used 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 green-up.

Apply 8 to 64 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 16 fluid ounces per acre may result in injury or delayed green-up in highly maintained areas, golf courses and lawns. DO NOT apply tank mixtures of this product plus Oust XP in highly maintained turfgrass areas. For further uses, refer to the "RAILROADS" section of this label, which gives rates for dormant bermudagrass treatment and the "ROADSIDES" section of this label, which gives rates for dormant bermudagrass and bahiagrass treatments.

Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. DO NOT apply more than 16 fluid ounces of this product per acre in highly maintained turfgrass areas. DO NOT apply tank mixtures of this product plus Oust XP 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 like 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. Delay tillage or renovation techniques such as vertical mowing, coring or slicing for 7 days after application to allow translocation into underground plant parts.

Desirable turfgrasses may be planted following the above procedures.

Hand-held equipment may be used for spot treatment of unwanted vegetation growing in existing turfgrass. Broadcast or hand-held equipment may be used to control sod remnants or other unwanted vegetation after sod is harvested.

If application rates total 3 quarts per acre or less, no waiting period between treatment and feeding or livestock grazing is required. If the rate is greater than 3 quarts per acre, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

8.4 Habitat Management

Habitat Restoration and Management

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This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including 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

This product may be used 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.

8.5 Hollow Stem Injection

Castorbean (*Ricinus communis*)

Inject 5 ml per 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 6 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 6 ml of a 5% v/v solution of this product.

Horsetail, Field (*Equisetum arvense*)

Inject one segment above the root crown with 0.6 ml per stem of this product. Use a small syringe that calibrates to this rate.

Knotweed, Bohemian (*Polygonum bohemicum*), Giant (*Polygonum sachalinense*), Japanese (*Polygonum cuspidatum*)

Inject 6 ml per stem of this product between second and third internode.

Reed, Giant (*Arundo donax*)

Inject 8 ml per stem of this product between the second and 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 0.6 ml per 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 10.6 quarts of this product per acre. At 6 ml per stem, 10.6 quarts treats approximately 1700 stems.

8.6 Injection and Frill (Woody Brush and Trees)

This product may be used to control or partially control woody brush and trees by injection or frill applications. Apply this product using suitable equipment that must penetrate into the living tissue. Apply the equivalent of 1/25 fluid ounce (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 these species, make the frill or cuts at an oblique angle to produce a cupping effect and use a 100 percent concentration of this product. For best results, make application during periods of active growth and after full leaf expansion.

8.7 Ornamentals, Plant Nurseries, and Christmas Trees

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Post-Directed, Trim-and-Edge

This product may be used prior to the planting of and as a post-directed spray around established woody ornamental species, arborvitae, azalea, boxwood, crabapple, eucalyptus, euonymus, fir, Douglas fir, jojoba, hollies, lilac, magnolia, maple, oak, poplar, privet, pine, spruce and yew, growing in plant nurseries, on Christmas tree farms, or on other non-food tree production sites. This product may 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 LABELED FOR USE 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 may be used prior to planting any ornamental, nursery or Christmas tree species.

Wiper Applications

This product may 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 may 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.

8.8 PASTURE GRASSES, FORAGE LEGUMES

Alfalfa, Clover, and Other Forage Legumes

This product may be used on Alfalfa, Clover, Kenaf, Kudzu, Lespedeza, Leucaena, Lupin, Sainfoin, Trefoil, Velvet bean, and Vetch (all types). This product can be applied preplant, preemergence, at-planting, or for renovation.

This product may also be used as a spot treatment (Alfalfa and Clover Only), over-the-top wiper applications (Alfalfa and Clover Only), or preharvest (Alfalfa Only).

Preplant, Preemergence, At-Planting

This product may be applied before, during or after planting crops listed in this section. Applications must be made prior to emergence of the crop.

If a single application is made at rates of 2 quarts per acre or less, no waiting period between treatment and feeding or grazing is required. If application rates greater than 2 quarts per acre are made, remove domestic livestock before application and wait 8 weeks after application before grazing or harvesting.

Renovation

This product may be applied as a broadcast spray to renovate existing stands of alfalfa, clover, and other labeled forage legumes.

Remove domestic livestock before application. If application rates of 2 quarts per acre or less are used wait 36 hours after application before grazing or harvesting. If application rates greater than 2 quarts per acre are used, wait 8 weeks between applications and grazing or harvesting.

Spot Treatment, Over-the-Top Wiper Applications (Alfalfa and Clover Only)

This product may be applied as a spot treatment in alfalfa or clover. This product may be applied with wiper applicators to control or suppress the weeds listed below. Applications may be made in the same area at 30-day intervals.

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For spot treatment and wiper applications, apply in areas where the movement of domestic livestock can be controlled. Treat no more than 10 percent of the total field area at one time. Remove domestic livestock before application and wait 14 days after application before grazing livestock or harvesting.

When applied as directed, this product CONTROLS the following weeds:

Corn, volunteer

Panicum, Texas

Rye, common

Shattercane

Sicklepod

Spanishneedles

Starbur, bristly

When applied as directed, this product SUPPRESSES the following weeds:

Beggarweed, Florida

Bermudagrass

Dogbane, hemp

Dogfennel

Guineagrass

Johnsongrass

Milkweed

Nightshade, silverleaf

Pigweed, redroot

Ragweed, common

Ragweed, giant

Smutgrass

Sunflower

Thistle, Canada

Thistle, musk

Vaseygrass

Velvetleaf

Preharvest (Alfalfa Only)

This product may be used in declining alfalfa stands or any stand of alfalfa where crop destruction is acceptable. This application will severely injure or destroy the stand of alfalfa. This product will control annual and perennial weeds, including quackgrass, when applied prior to the harvest of alfalfa. The treated crop and weeds can be harvested and fed to livestock after 36 hours. Allow a minimum of 36 hours between application and harvest. Applications may be made at any time of the year. Make only one application to an existing stand of alfalfa per year. For control of quackgrass, apply in the spring, late summer or fall when quackgrass is actively growing. Treatments for quackgrass must be followed by deep tillage for complete control.

Do not apply more than 2 quarts of this product per acre as a preharvest treatment. Preharvest application to alfalfa grown for seed may result in a reduction in germination or crop vigor.

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8.9 Rangelands

This product can be applied postemergence and 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.

Delay grazing of treated areas to encourage growth of desirable perennials. Allowing desirable perennials to flower and reseed in the treated area will encourage successful transition.

Do not use ammonium sulfate when spraying rangeland grasses with this product. Do not apply more than 3 quarts per acre per year.

Apply 12 to 16 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 mature 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. Make Fall applications where spring moisture is limited and fall germination allows for good weed growth.

For medusahead, apply 16 fluid ounces of this product per acre at the 3-leaf stage. Delaying applications beyond this stage will result in reduced or unacceptable control. Fire may be useful in eliminating the thatch layer produced by slow 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.

8.10 Parks, Recreational and Residential Areas

This product may be used in parks, recreational and residential areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around trees, fences, and paths, around buildings, sidewalks, and other objects in these areas. This product may be used for spot treatment of unwanted vegetation. This product may be used to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

All of the instructions in the "**Non-Crop Areas and Industrial Sites**" section apply to park and recreational areas.

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 may be used to maintain bare ground on railroad ballast and shoulders. Repeat applications of this product may be used, as weeds emerge, to maintain bare ground. This product may 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.

This product may be tank mixed with the following products provided that the specific product is registered for ballast, shoulder, spot, bare ground and crossing treatments:

Arsenal	Krovar I DF
Clarity	Oust XP
Diuron	Sahara
Escort	Spike
Garlon 3A	Telar
Garlon 4	Vanquish

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Hyvar X	2,4-D
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Brush Control

This product may be used to control woody brush and trees on railroad rights-of-way. Apply 4 to 10 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 3/4 to 2-percent solution of this product when using high-volume spray-to-wet applications. Apply a 5- to 10-percent solution of this product when using low volume directed sprays for spot treatment. This product may be mixed with the following products for enhanced control of woody brush and trees:

Arsenal	Garlon 4
Escort	Tordon K
Garlon 3A	

Bermudagrass Release

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 1 to 3 pints 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	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

This product may be tank-mixed with Oust XP. If tank-mixed, use no more than 1 to 3 pints 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	Fescue, tall
Blackberry	Johnsongrass
Bluestem, silver	Poorjoe
Broomsedge	Raspberry
Dallisgrass	Trumpetcreeper
Dewberry	Vaseygrass
Dock, curly	Vervain, blue
Dogfennel	

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

This product may be used on road shoulders. It may be 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 may be used to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment

This product may be used as a spot treatment to control unwanted vegetation growing along roadsides.

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Tank Mixtures

This product may be tank-mixed with the following products for shoulder, guardrail, spot and bare ground treatments provided that the specific product is registered for use on such sites. Read and carefully observe label directions, cautionary statements and all information on the labels of all products used.:

Clarity	Princep DF
Diuron	Princep Liquid
Endurance	Ronstar 50WSP
Escort	Sahara
Krovar I DF	simazine
Oust XP	Surflan
Outrider	Telar
Pendulum 3.3 EC	Vanquish
Pendulum WDG	2,4-D

See the "Tank Mixture" section of this label for tank mixing instructions.

Release of Bermudagrass or Bahiagrass

Dormant Applications

This product may 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 green-up. This product may also be tank-mixed with Outrider or Oust XP for residual control. Tank mixtures of this product with Oust XP may delay green-up.

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 8 to 64 fluid ounces of this product in a tank mixture with 3/4 to 1-1/3 ounces Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

Apply 8 to 64 fluid ounces of this product per acre alone or in a tank mixture with 1/4 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 green-up and minimize injury, add no more than 1 ounce of Oust XP per acre on bermudagrass and no more than 1/2 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 may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 1 to 3 pints 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	Johnsongrass
Bluestem, silver	Trumpet creeper
Fescue, tall	Vaseygrass

This product may be tank mixed with Outrider for control or partial control of Johnsongrass and other weeds listed in the Outrider label. Use 8 to 32 fluid ounces of this product with 3/4 to 1 1/3 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 may be tank mixed with Oust XP. If tank-mixed, use no more than 1 to 2 pints 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

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

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	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpet creeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season causes severe injury.

Actively Growing Bahiagrass

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 6 fluid ounces of this product in 10 to 40 gallons of water per acre. Apply 1 to 2 weeks after full green-up 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 4 fluid ounces of this product per acre, followed by an application of 2 to 4 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

This product may be used for control or partial control of Johnsongrass and other weeds listed on the Outrider label in actively growing bahiagrass. Apply 1-1/2 to 4-3/4 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 6 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

This product is labeled for use along electrical power, pipeline and telephone rights-of-way, and in other sites associated with these rights-of-way, substations, roadsides, railroads or similar rights-of-way that run in conjunction with utilities.

This product may be used in utility sites and substations for bare ground, trim-and-edge, spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting a utility site to ornamentals, flowers, turfgrass (sod or seed), or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

This product is also labeled for 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 may be used to increase the spectrum of control for herbaceous weeds, woody brush and trees provided that the specific product is registered for application to the desired site. 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 may be used in a tank mix.

For control of herbaceous weeds, use the lower labeled tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher labeled rates.

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

TANK MIXTURES: This product may be tank mixed with the following products for use in utility sites, provided that the specific product used is labeled for use on these sites. Refer to the individual product labels for approved sites and application rates.

Arsenal	atrazine ¹
Barricade 65WG	dicamba ¹
diuron ¹	Endurance
Escort	Escort XP
Garlon 3A ²	Garlon 4 ³
Krenite	Krovar I DF
Oust	Oust XP
Outrider	pendimethalin ¹
Plateau	
Ronstar 50WP	Sahara
simazine ¹	Surflan AS
Surflan WDG	Telar DF
Transline	Vanquish
Velpar DF	Velpar L
2,4-D ¹	

¹ Tank mixtures with product containing this generic active ingredient may be made provided the specific product is labeled for application at the use site.

² 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 incompatibility problems.

³ For side trimming treatments, use this product alone or in a tank mixture with Garlon 4.

Bare Ground and Trim-and-Edge

This product may be used in 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 may be used prior to planting a utility site to ornamentals, flowers, turfgrass (sod or seed), or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

This product may be tank mixed with the following products. Refer to these products' labels for approved non-crop sites and application rates.

Arsenal	Plateau™
Banvel	Princep™DF
Barricade™ 65WG	Princep™ Liquid
Diuron	Ronstar™ 50WP
Endurance™	Sahara™
Escort	simazine
Garlon 3A	Surflan™

9.0 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 (noncultivated) area.

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

Reduced results may occur when treating weeds heavily covered with dust. For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

For low-volume directed spray applications, use a 5- to 10-percent solution of this product for control or partial control of annual weeds, perennial weeds, or woody brush and trees. Spray coverage must be uniform with at least 50 percent of the foliage contacted. Coverage of the top one-half of the plant is important for best results. 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 resprouts.

Refer to the following label sections for labeled 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, this product may be used at 5 to 10 quarts per acre for enhanced results.

9.1 Annual Weeds

Use 1 quart per acre if weeds are less than 6 inches in height or runner length and 1.5 quarts 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 1/2-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 1- to 2-percent solution. Use the higher rate for tough-to-control species or for weeds over 24 inches tall.

WEED SPECIES

Anoda, spurred
Barley*
Barley, little *
Barnyardgrass*
Bassia, fivehook
Bittercress*
Bluegrass, annual*
Bluegrass, bulbous*
Brome, downy*
Brome, Japanese*
Buttercup*
Castorbean
Cheatgrass*
Cheeseweed (<i>Malva parviflora</i>)
Chervil*
Chickweed*
Cocklebur*
Copperleaf, hophornbeam
Copperleaf, Virginia
Coreopsis, plains/tickseed *
Corn*
Crabgrass*
Cupgrass, woolly *
Dwarf dandelion*
Eclipta*
Falsedandelion*
Falseflax, smallseed*
Fiddleneck
Filaree
Fleabane, annual*
Fleabane, hairy (<i>Conyza bonariensis</i>)*

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

Fleabane, rough*
Foxtail*
Foxtail, Carolina *
Geranium, Carolina
Goatgrass, jointed*
Goosegrass
Groundsel, common*
Henbit
Horseweed/Marestail (<i>Conyza canadensis</i>)
Itchgrass*
Johnsongrass, seedling
Junglerice
Knotweed
Kochia
Lamb's-quarters*
Lettuce, prickly *
Mannagrass, eastern *
Mayweed
Medusahead*
Morningglory (<i>Ipomoea spp</i>)
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*
Ragweed, giant
Rice, red
Rocket, London *
Rocket, yellow
Rye*
Ryegrass*
Sandbur, field*
Sesbania, hemp
Shattercane*
Shepherd's-purse*
Sicklepod
Signalgrass, broadleaf*
Smartweed, ladythumb*
Smartweed, Pennsylvania*
Sorghum, grain (milo)*
Sowthistle, annual
Spanishneedles

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

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*

*When using field broadcast equipment (aerial applications or boom sprayers using flat-fan nozzles) these species will be controlled or partially controlled using 1 pint 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.

9.2 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.

Use a 2-percent solution on tough-to-control perennials like bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

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 5- to 10-percent solution of this product.

Allow 7 or more days after application before tillage.

Weed Species**Rate
(QT/A)****Hand-Held
% Solution**

Alfalfa*	1	2
Alligatorweed*	4	1.5
Anise (fennel)	2-4	1-2
Artichoke, Jerusalem	3-5	2
Bahiagrass	3-5	2
Beachgrass, European (<i>Ammophila arenaria</i>)	--	5
Bentgrass*	1.5	2
Bermudagrass	5	2
Bermudagrass, water (knotgrass)	1.5	2
Bindweed, field	4-5	2
Bluegrass, Kentucky	2	2
Blueweed, Texas	4-5	2
Brackenfern	3-4	1-1.5
Bromegrass, smooth	2	2
Bursage, woolly-leaf	--	2
Canarygrass, reed	2-3	2
Cattail	3-5	2

I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

Clover, red, white	3-5	2
Cogongrass	3-5	2
Dallisgrass	3-5	2
Dandelion	3-5	2
Dock, curly	3-5	2
Dogbane, hemp	4	2
Fescue (except tall)	3-5	2
Fescue, tall	1-3	2
Guineagrass	3	1
Hemlock, poison	2-4	1-2
Horsenettle	3-5	2
Horseradish	4	2
Iceplant	2	1.5-2
Ivy, German	2-4	1-2
Johnsongrass	2-3	1
Kikuyugrass	2-3	2
Knapweed	4	2
Lantana	--	1-1.25
Lespedeza	3-5	2
Milkweed, common	3	2
Muhly, wirestem	2	2
Mullein, common	3-5	2
Napiergrass	3-5	2
Nightshade, silverleaf	2	2
Nutsedge; purple, yellow	3	1-2
Orchardgrass	2	2
Pampasgrass	3-5	1.5-2
Paragrass	3-5	2
Pepperweed, perennial	4	2
Phragmites*	3-5	1-2
Quackgrass	2-3	2
Redvine*	2	2
Reed, giant	4-5	2
Ryegrass, perennial	2-3	1
Smartweed, swamp	3-5	2
Spurge, leafy*	--	2
Sweet potato, wild*	--	2
Thistle, artichoke	2-3	1-2
Thistle, Canada	2-3	2
Timothy	2-3	2
Torpedograss*	4-5	2
Trumpetcreeper*	2-3	2
Vaseygrass	3-5	2
Velvetgrass	3-5	2
Wheatgrass, western	2-3	2

*Partial control

9.3 Woody Brush and Trees

Apply this product after full leaf expansion, unless otherwise directed in this label or separate supplemental label or Fact Sheet published by Monsanto [this company]. 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.

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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 5- to 10-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	3-4	1-1.5
Ash*	2-5	1-2
Aspen, quaking	2-3	1-1.5
Bearclover (Bearmat)*	2-5	1-2
Beech*	2-5	1-2
Birch	2	1
Blackberry	3-4	1-1.5
Blackgum*	2-5	1-2
Bracken	2-5	1-2
Broom; French, Scotch	2-5	1.5-2
Buckwheat, California*	2-4	1-2
Cascara*	2-5	1-2
Catsclaw*	--	1-1.5
Ceanothus*	2-5	1-2
Chamise*	2-5	1
Cherry; bitter, black, pin	2-3	1-1.5
Coyotebrush	3-4	1.5-2
Creepers, Virginia	2-5	1-2
Deerweed	2-5	1
Dogwood*	2-5	1-2
Elderberry	2	1
Elm*	2-5	1-2
Eucalyptus	--	2
Flower, monkey flower*	2-4	1-2
Gorse*	2-5	1-2
Hasardia*	2-4	1-2
Hawthorn	2-3	1-1.5
Hazel	2	1
Hickory*	2-5	1-2
Honeysuckle	3-4	1-1.5
Hornbeam, American*	2-5	1-2
Ivy, poison	4-5	2
Kudzu	4	2
Locust, black*	2-4	1-2
Madrone resprouts*	--	2
Manzanita*	2-5	1-2
Maple, red*	2-4	1-1.5
Maple, sugar	--	1-1.5
Maple, vine *	2-5	1-2

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Oak; black, white*	2-4	1-2
Oak, post	3-4	1-1.5
Oak; northern pin	2-4	1-1.5
Oak, poison	4-5	2
Oak, scrub*	2-4	1-1.5
Oak, southern red	2-3	1-1.5
Olive, Russian *	2-5	1-2
Peppertree, Brazilian (Florida holly)*	2-5	1-2
Persimmon*	2-5	1-2
Pine	2-5	1-2
Poplar, yellow*	2-5	1-2
Redbud, eastern	2-5	1-2
Rose, multiflora	2	1
Sage, black	2-4	1
Sage, white*	2-4	1-2
Sage brush, California	2-4	1
Salmonberry	2	1
Saltcedar*	2-5	1-2
Sassafras*	2-5	1-2
Sourwood*	2-5	1-2
Sumac; laurel, poison, smooth, sugarbush, winged *	2-4	1-2
Sweetgum	2-3	1-1.5
Swordfern*	2-5	1-2
Tallowtree, Chinese	--	1
Tanoak resprouts*	--	2
Thimbleberry	2	1
Tobacco, tree*	2-4	1-2
Toyon*	-	2
Trumpetcreeper	2-3	1-1.5
Waxmyrtle, southern*	2-5	1-2
Willow	3	1
Yerba Santa, California*	-	2

*Partial control

10.0 LIMIT OF WARRANTY AND LIABILITY

Monsanto Company [This 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. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, 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 extent consistent with applicable 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.

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I. MAIN LABEL FOR INDUSTRIAL, TURF, AND ORNAMENTAL USES

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.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, 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. 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.

[INSERT BRAND NAME], Outrider, Monsanto and Vine symbol are trademarks of Monsanto Technology LLC. All other trademarks are the property of their respective owners.

This product is protected by U.S. Patent Nos. 5,683,958; 5,703,015; 6,063,733; 6,121,199; 6,121,200. No license granted under any non-U.S. patent(s).

EPA Reg. No. 524-517

In case of an emergency involving this product,

or for medical assistance,

Call Collect, day or night, (314) 694-4000.

©[DATE] MONSANTO COMPANY [INSERT COMPANY NAME]

Packed For: *[Produced (Manufactured) for:]*

[Insert company name & mailing address]

Monsanto Company

800 N. Lindbergh Blvd.

ST. LOUIS, MISSOURI, 63167 U.S.A.

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II. SUPPLEMENTAL LABELING FOR INDUSTRIAL, TURF, & ORNAMENTAL USES

Table of Contents: Industrial, Turf, and Ornamental Supplemental labeling

	Name	EPA APPROVAL
A	FOR USE FOR SELECTIVE WEED CONTROL ON [INSERT BRAND NAME] TOLERANT PURE GOLD® TALL FESCUE AND AURORA GOLD® FINE FESCUE SELECTIONS.	Nov 20, 2002
B	[INSERT BRAND NAME] HERBICIDE AND TANK MIXTURES FOR NON-CROP AREAS, INCLUDING RAILROAD RIGHTS-OF-WAY, SUBSTATIONS, AIRPORTS, INDUSTRIAL PLANTS, ROADSIDES, STORAGE AREAS AND SIMILAR SITES	Nov 20, 2002
C	AERIAL APPLICATIONS IN CALIFORNIA	Amended this submission
D	FOR USE IN CITRUS CROPS IN FLORIDA	June 19, 2008

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SUPPLEMENTAL LABELING

READ THE ENTIRE LABEL FOR **[INSERT BRAND NAME]** BEFORE PROCEEDING WITH THE USE DIRECTIONS CONTAINED IN THIS SUPPLEMENTAL LABELING.

When using **[INSERT BRAND NAME]** as permitted according to this supplemental labeling, read and follow all applicable directions, restrictions, and precautions on the label booklet provided with the pesticide container and on this supplemental labeling. This supplemental labeling must be in the possession of the user at the time of pesticide application.

[INSERT BRAND NAME HERE]

Herbicide

[INSERT SUPPLEMENTAL TITLE HERE]

EPA Reg. No. 524-517

Keep out of reach of children.

CAUTION!

In case of an emergency involving this product, Call Collect, day or night, 314-694-4000.

[INSERT BRAND NAME] is a trademark of Monsanto Technology LLC *[insert Company name]*.

DIRECTIONS FOR USE

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

This labeling must be in the possession of the user at the time of herbicide application.

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.

See "PRODUCT INFORMATION" and "MIXING" sections of the label booklet for **[INSERT BRAND NAME]** for essential product performance information.

[INSERT SPECIFIC DIRECTIONS FOR USE HERE]

Read the "Limit of Warranty and Liability" in the label booklet for **[INSERT BRAND NAME]** before using. These terms apply to this supplemental labeling and if these terms are not acceptable, return the product unopened at once.

© [DATE] MONSANTO COMPANY

800 N. Lindbergh Blvd.

ST. LOUIS, MISSOURI 63167

[Insert company name and mailing address]

A. FOR USE FOR SELECTIVE WEED CONTROL ON [INSERT BRAND NAME] TOLERANT PURE GOLD® TALL FESCUE AND AURORA GOLD® FINE FESCUE SELECTIONS.

[INSERT BRAND NAME] Tolerant Tall Fescue Selections For Seed Production

Use this product on [INSERT BRAND NAME] tolerant tall and fine fescue grown for seed production only.

This product may be applied at rates of 4 to 16 fluid ounces per acre as a postemergence spray on [INSERT BRAND NAME] tolerant tall fescue selections. See the label booklet for application instructions, rates, weeds controlled and proper growth stage of weeds.

When applied postemergence, this product will control or suppress the following weeds: annual bluegrass mustards, downy brome, cheatgrass, chickweed, pennycress, fleabane, shepherd's-purse, sowthistle, wild oat, dandelion, quackgrass, and Canada thistle. See the [INSERT BRAND NAME] label booklet for a complete list of weeds controlled or suppressed.

NOTE: The labeled rate for this use will limit the level of control of certain species of weeds.

NOTE: Some crop discoloration and yellowing may occur at higher rates of application with **INSERT BRAND NAME** tolerant tall and fine fescue selections. Reduction in stand of these selections may occur under stress conditions.

Timing Of Applications

Applications can be made 6 weeks after germination and to established crops after growth resumes in the Fall until onset of dormancy and in the Spring after dormancy break until 60 days prior to harvest.

Avoid spraying during or within two weeks after periods when air temperatures fall below 25°F.

Remove domestic livestock from the seed production field prior to application. Wait 60 days after making this application before grazing or harvesting the treated area.

NOTE: Only two applications per crop growth cycle may be made to any one site. If two applications are required, only one Fall and one Spring application may be made during one 12 month cycle.

B. [INSERT BRAND NAME] HERBICIDE AND TANK MIXTURES FOR NON-CROP AREAS, INCLUDING RAILROAD RIGHTS-OF-WAY, SUBSTATIONS, AIRPORTS, INDUSTRIAL PLANTS, ROADSIDES, STORAGE AREAS AND SIMILAR SITES

Do not allow spray mixtures of this herbicide to mist, drip, drift or splash onto desirable vegetation since injury or destruction may occur. Do not apply when wind or other conditions favor drift.

See the "WEEDS CONTROLLED" section of the [INSERT BRAND NAME] label booklet for application rates. For difficult to control species, where dense stands occur, or where conditions for control are not ideal, 5 to 10 quarts per acre of this product may be used for improved results.

TANK MIXTURES

This product provides control of the emerged weeds listed in the label booklet. 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.

The following list of products may be tank mixed with this product provided that the specific product is registered for application to the desired site. Any labeled rate of this product may be used in a tank mixture with these products.

Tank-mix Product

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	
Spike™ 80W	
Spike 80W + 2,4-D	
Spike 80W + Garlon 3A	
Spike 80W + Garlon 4	

Arsenal is not approved for use in the state of California.

Refer to the individual product labels for specific non-crop sites, rates, carrier volumes and precautionary statements.

Read and carefully observe the label claims, cautionary statements, labeled use rates and all other information on the labels of all products used in these tank mixtures. Use according to the most restrictive label directions for each product in the mixture.

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.

When used in combination as recommended by Monsanto Company [*this company*], the liability of Monsanto [*this company*] shall in no manner extend to any damage, loss or injury not solely and directly caused by the inclusion of the Monsanto [*this*] product in such combination use.

C. LIMITATIONS ON AERIAL APPLICATION IN CALIFORNIA ONLY, INCLUDING FRESNO COUNTY, CALIFORNIA**DIRECTIONS FOR USE**

All labeled treatments may be made by aerial equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on this supplemental labeling and in the product label booklet. Refer to Aerial Equipment in the "APPLICATION EQUIPMENT AND TECHNIQUES" section of the product label for additional information. Refer to the individual use site section of the product label, or to other supplemental labeling or technical fact sheets published separately for this product by Monsanto *[insert company name]*, for specific use instructions.

AVOID DRIFT—DO NOT APPLY WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT MAY CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the following guidelines when aerial applications are made near crops or desirable perennial vegetation after bud break and before total leaf drop, and/or near other desirable vegetation or annual crops.

1. Do not apply within 100 feet of all desirable vegetation or crop(s).
2. If wind up to 5 miles per hour is blowing toward desirable vegetation or crop(s), do not apply within 500 feet of the desirable vegetation or crop(s).
3. Winds blowing from 5 to 10 miles per hour toward desirable vegetation or crop(s) may require buffer zones in excess of 500 feet.
4. Do not apply when winds are in excess of 10 miles per hour or when inversion conditions exist.

When applied as directed under the conditions described, this product controls annual and perennial weeds listed in the label booklet.

When tank-mixing this product with 2,4-D, only 2,4-D amine formulations may be used for aerial application in California. Tank mixtures with 2,4-D amine formulations may be applied by air in California for fallow and reduced tillage systems, and for alfalfa and pasture renovation applications only.

This product, when tank-mixed with dicamba, may not be applied by air in California.

ADDITIONAL INFORMATION FOR FRESNO COUNTY, CALIFORNIA

The following information applies only from February 15 through March 31 within the following boundaries of Fresno County, California:

North: Fresno County line
South: Fresno County line
East: State Highway 99
West: Fresno County line

Always read and follow the label directions and precautionary statements for all products used in the aerial application.

Observe the following directions to minimize off-site movement during aerial application of this product. Minimization of off-site movement is the responsibility of the grower, Pest Control Advisor and aerial applicator.

Written Recommendations

A written recommendation **MUST** be submitted by or on behalf of the applicator to the Fresno County Agricultural Commissioner 24 hours prior to the application. This written recommendation **MUST** state the proximity of surrounding crops, and that conditions of each manufacturer's product label and this label have been satisfied.

Aerial Applicator Training and Equipment

Aerial application of this product is limited to pilots who have successfully completed a Fresno County Agricultural Commissioner and California Department of Pesticide Regulation approved training program for aerial application of herbicides. All aircraft must be inspected, critiqued in flight and certified at a Fresno County Agricultural Commissioner approved fly-in. Test and calibrate spray equipment at intervals sufficient to insure that proper rates of herbicides and adjuvants are being applied during commercial use. Applicator must document such calibrations and testing. Demonstration of performance at Fresno County Agricultural Commissioner approved fly-ins constitutes such documentation, or other written records showing calculations and measurements of flight and spray parameters acceptable to the Fresno County Agricultural Commissioner.

Applications at Night—Do not apply this product by air earlier than 30 minutes prior to sunrise and/or later than 30 minutes after sunset without prior permission from the Fresno County Agricultural Commissioner.

To report known or suspected misuse of this product, call 1-800-332-3111.

For additional information on the proper aerial application of this product, call 916-784-1718.

D. FOR USE IN CITRUS CROPS

DIRECTIONS FOR USE

LABELED CROPS: Calamondin, Chironja, Citron, Citrus Hybrids, Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Orange (all), Pummelo, Satsuma Mandarin, Tangelo (ugli), Tangor

TYPES OF APPLICATION: Preplant (Site Preparation) Broadcast Spray, Middles (between rows), Strips (within rows), Shielded Sprayer, Hooded Sprayer, Wiper Applicator, Directed Spray, Spot Treatment

USE INSTRUCTIONS: Applications may be made with boom equipment, CDA equipment, shielded sprayer, hand-held and high-volume wand, lance, orchard gun or with wiper applicator equipment, except as directed. Apply this product according to the rates listed in the "ANNUAL WEEDS" and "PERENNIAL WEEDS" sections of the Complete Directions for Use booklet for [Insert Brand Name] herbicide. Use the higher rate in the labeled range when weeds are stressed, growing in dense populations or greater than 12 inches tall. Repeat applications may be made up to a maximum of 10.6 quarts of product per acre per year.

For burndown or control of the weeds listed below, apply the labeled rate 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 2 to 3 quarts of this product per acre in 20 to 30 gallons of water per acre when plants are actively growing. Use 2 quarts per acre when plants are less than 8 inches tall and 3 quarts 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 weed control.

Perennial Weeds:

S = Suppression

B = Burndown

PC = Partial Control

C = Control

WEED SPECIES	[Insert Brand Name] Herbicide RATE PER ACRE			
	1 QT	2 QT	3 QT	5 QT
Bermudagrass	B	—	PC	C
Guineagrass				
Florida Ridge	B	C	C	C
Florida Flatwoods	—	B	C	C
Paragrass	B	C	C	C
Torpedograss	S	—	PC	C

Refer to the individual product labels for listing of specific crops, rates, geographic restrictions and precautionary statements.

Middles (between rows)

USE INSTRUCTIONS: This product will control or suppress annual and perennial weeds, and ground covers growing in the middles (between rows of trees). If weeds are under drought stress, irrigate prior to application. Reduced weed control may result if weeds have been recently mowed at the time of application.

TANK MIXTURES: A tank mixture of this product plus Goal 2XL may be applied for annual weed control in-between rows (middles) of citrus trees, especially when weeds are stressed or growing in dense populations. Application of 16 to 32 fluid ounces of this product, plus 3 to 12 fluid ounces of Goal 2XL, per acre will control annual weeds with a maximum height of 6 inches, including crabgrass, common groundsel, junglerice, common lambsquarters, redroot pigweed, London rocket, common ryegrass, shepherd's-purse, annual sowthistle, filaree (suppression), horseweed/marestail (*Conyza canadensis*), stinging nettle and common purslane (suppression). This tank mixture will also control common cheeseweed (malva) or hairy fleabane (*Conyza bonariensis*) with a maximum height or diameter of 3 inches. Read and follow label directions for all products in the tank mixture.

Strips (in rows)

USE INSTRUCTIONS: For applications in strips (within rows of trees), only selective equipment (directed sprays, hooded sprayers, shielded applicators, or wipers) should be used, and then only where there is sufficient clearance, in order to minimize the potential for overspray or drift of this product onto the crop.

TANK MIXTURES: This product may be applied within rows of trees in tank mixtures with the following products:

Devrinol 50-DF, Direx 4L, Goal 2XL, Karmex DF, pendimethalin, Princep Caliber 90, Simazine 4L, Sim-Trol 4L, Solicam DF, Surflan AS,

Refer to the tank mixture product label for restrictions and precautions; use according to the most restrictive precautionary statements for each product in the tank mixture.

PRECAUTIONS, RESTRICTIONS: Use extreme care to avoid contact of this herbicide solution, spray, drift or mist with foliage or bark of trunk, branches, suckers, fruit or other parts of trees. Avoid applications when recent pruning wounds or other mechanical injury has occurred. Contact of this product with other than matured brown bark can result in serious crop damage or destruction. Only shielded or directed sprayers may be used where there is the potential for crop contact, and then only where there is sufficient clearance. See additional use instructions and precautions in the "**Application Equipment And Techniques**" section of the directions for use booklet for [Insert Brand Name].

Allow a minimum of 1 day between last application and harvest in citrus crops. Allow a minimum of 3 days between application and transplanting trees.

For citron groves, apply as a directed spray only.

Revisions this submission for 000524-00517.20091214.amend.pdf

Removal of alternate brand names

Support of Ranger PRO as base brand name

Changes requested by EPA October 29, 2009 approval to remove general.

Change/delete uses of recommend and other advisory statements as requested on other recent EPA approvals resulting in slight re-wording of some sentences.

Exhibit 21



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

March 10, 2016

Ona E. Maune
Federal Regulatory Affairs Manager
Monsanto Company
1300 I Street NW Suite 450 East
Washington, DC 20005

Subject: Label Amendment – Label Format Changes
Product Name: RD 1687 Herbicide
EPA Registration Number: 71995-51
Application Date: 12/18/2014
Decision Number: 499010

Dear Ms. Maune:

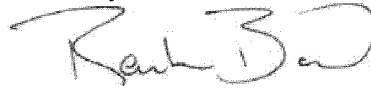
The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable. This approval does not affect any conditions that were previously imposed on this registration. You continue to be subject to existing conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one copy of the final printed labeling before you release the product for shipment with the new labeling. In accordance with 40 CFR 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR 152.3.

Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under the Federal Insecticide Fungicide and Rodenticide Act and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) list examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

Your release for shipment of the product constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6. If you have any questions, please contact Sarah Meadows by phone at 703-347-0505, or via email at meadows.sarah@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Reuben Baris". The signature is fluid and cursive, with the first name "Reuben" and last name "Baris" clearly distinguishable.

Reuben Baris, Product Manager 25
Herbicide Branch
Registration Division (7505P)
Office of Pesticide Programs

Enclosure

MASTER LABEL FOR EPA REG. NO. 71995-51

Primary Brand Name:

RD 1687 Herbicide

Alternate Brand Names:

Roundup® Ready-To-Use Max Control 365

Roundup® Ready-To-Use 365 Weed & Grass Killer Plus Weed Preventer

Editorial Notes:

Bold, italicized text is information for the reader and is not part of the label.

Bracketed text [] is optional text and a 'place holder' for graphics.

Text separated by a backslash '/' denotes 'and/or' options.

Note: Duration references of 1 Year= 12 Months= 52 Weeks= 365 Days can be used throughout the label.

Refer to APPENDIX 1 for Consolidated List of Label Claims; APPENDIX 2 for Packaging Related Claims; and

APPENDIX 3 for Packaging Related Instructions.

[Insert Brand Name and Logo]

[Insert Claims from Appendix 1 or 2] [Insert Graphics]

ACTIVE INGREDIENTS:

Glyphosate, isopropylamine salt[†] 1.00%

Imazapic, ammonium salt^{††} 0.08%

Diquat dibromide 0.04%

OTHER INGREDIENTS 98.88%

TOTAL **100.00%**

[†]Contains 0.06 lb. glyphosate acid equivalent and ^{††} 0.006 lb. imazapic acid equivalent per US gallon.

Keep Out of Reach of Children

CAUTION

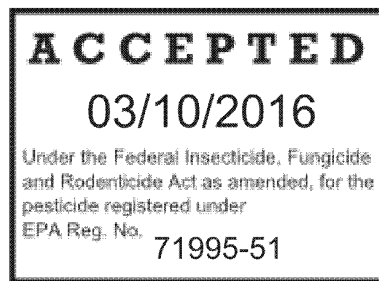
See [back/ side] [panel/ booklet/ label] for additional precautionary statements.

Alternative Text: [See container label for [complete] use directions and additional precautionary statements.]

NET [Insert Net contents FL OZ or GAL, see Appendix 2] [Insert Metric Conversion]

Net contents of final printed labeling based on various commercial sizes to be marketed

[Insert 2D code/ PPN code/ LB code]



Optional Instructions for Booklet

OPEN/ ABRA

Open Booklet for Assembly and Use Instructions

Open booklet for details

Press to Reseal

Resealable Label for Directions & Precautions

Optional text for Pump 'N Go® 2 Sprayer [Insert Logo/ Graphics]

[The FAST and EASY Way to Kill and Prevent Weeds for up to 12 Months!] [Insert Claims from Appendix 1 or 2]

- [[The] Pump 'N Go® 2 sprayer provides up to [10/ insert length of spray time] minutes of continuous spray!]
- [Extendable wand provides greater accuracy without bending over.]

[Connect/ Extend/ Pump [insert# of time]/ Spray/ Store/ Depressurize/ Retighten to Store] [Insert Graphics for each step]

[DID YOU KNOW?]

[People and pets may enter treated area after spray has dried]

[Insert Claims from Appendix 1 or 2]

[Insert Graphics]

[Use this product in areas where control of vegetation is desired for up to [1 year/ 12 months/ 365 days]. It is not for use on lawns, on or around fruits, vegetables, flowers, trees, shrubs or other plants, or over the root zones of desirable vegetation.]

IMPORTANT! To prevent new weeds and grasses from growing, YOU MUST SPRAY THE ENTIRE AREA you want to control, NOT JUST the emerged weeds.

Optional Roundup® Graphics Wheel with the following Where To Use, What To Know and How To Use components

WHERE TO USE [Insert Graphics]

[[Yellow color/ insert color] represents area to be sprayed to receive up to [1 year/ 12 month] weed-free control.]

[[NOTE:] Product goes on clear and will not stain. [Insert color] [highlight/ color] shown for illustration purposes only.]

- [Driveway [&/ and] Sidewalk Cracks]
- [Patios [&/ and] Paths]
- [Along Fences [&/ and/ Curbs]]
- [Gravel Areas]

WHAT TO KNOW [Insert Graphics]

- [Rainproof in 30 Minutes]
- [Visible Results in 12 Hours]
- [Covers Up To [insert value from Appendix 2] sq ft]
- [Plant [12 months/ 1 Year] After Application[*] [*] (see booklet for details)]

HOW TO USE [Insert Graphics] *Select applicable packaging type below*

Battery Operated Sprayer Containers [Insert Graphics]

Connect Hose

Extend [Wand/ Insert Applicator Name]

[Add /Cone/ Dome/ Guard/ Shield]

Twist Nozzle [and/ &] Spray [Weeds]

Pump 'N Go® 2 Sprayer Containers [Insert Graphics]

[Connect Hose & Extend Wand]

[Pump & Spray [Weeds]]

Quick Connect Sprayers [Insert Graphics]

Pull Tubing Out

Insert Into Cap [(until it clicks)]

[Flip Cap Up/ Flip Up Spout/ [Turn/ Twist] [Spout/ Knob] to ON/ Pull Spout Up]

Adjust Spray Nozzle

[&/ Spray/ Weeds]

Refill Containers [Insert Graphics]

Pour Refill Into [Empty/ Insert Packaging Type] Container

[or] [Connect/ Reuse/ Transfer] [Insert Applicator Name/ Wand] [on/ to/ this] [Container/ Bottle]

[Do NOT Add Water [Picture of Droplet]]

Trigger Sprayers [Insert Graphics]

Adjust Nozzle

Spray Weeds [You Want To Kill]

[DO NOT USE:

In areas that will be planted or seeded within 1 year [(see booklet for details)]

Anti-theft device statement: [This bottle [may] contain[s] an anti-theft device[, either inside or on the back of the bottle]. [It does not affect product performance.]]

©[Insert Year] [MONSANTO COMPANY] [Insert Company Name]
[Produced/ Manufactured/ Distributed] [for/ by]] [Monsanto Company
Lawn & Garden Products] [Insert Company Name]
[P.O. Box 418 Marysville, OH 43041] [Insert Address]
[www.roundup.com]

EPA Reg. No. 71995-51

EPA Est. 239-IA-3^l, 239-MS-001^M [Insert Additional Establishments]

Superscript is first letter of lot number

[Made in/ Manufactured in/ Produced in/ Assembled in/ Product of] [USA/ [Insert Country]] [with [insert# %] or more US parts/ with over [insert# %] US parts/ with foreign and domestic parts]]

[Insert 2D code/ PPN code/ LB code] [Insert UPC Barcode/ Proof of Purchase]

[Insert LOT number or LOT number will be printed directly on the container]

Pump 'N Go® 2 Sprayer Container Only: Insert 'HOW TO ASSEMBLE AND USE INSTRUCTIONS' from Appendix 3

Optional Section:

PRODUCT FACTS

[WHAT IT DOES]

[KILLS [AND/ &] PREVENTS ALL TYPES OF [TOUGH] WEEDS [AND/ &] GRASSES] [including [Insert from Weed List] [for up to 1 year]

[[Kills/ Controls] common weeds [and/ &] grasses [brush] [including/ such as] *Alternative Text:* [[Common] Weeds [grasses/ [& and]/ brush] controlled [include:]] [Bermudagrass, Black Medic, Buckhorn Plantain, Buttercup, Common Purslane, Curly Dock, Crabgrass, Dandelion, Kentucky Bluegrass, Lambsquarters, Morning Glory, Perennial Ryegrass, Spotted Spurge, Fescue, White Clover, and Yellow Nutsedge [Insert from Weed List] [and other broadleaf [and/ &] grassy weeds [brush]]].

[Insert Graphic of grassy, broadleaf and woody weeds]

[[Container] [covers/ treats] up to [insert X value from Appendix 2] sq ft.

[Insert Claims from Appendix 1 or 2]

[This product is intended for use in areas where control of vegetation is desired for up to 1 year. It is not for use on lawns, on or around fruits, vegetables, flowers, trees, shrubs or other plants, or over the root zones of desirable vegetation.]

HOW IT WORKS [Insert Graphics]

IMPORTANT: To prevent new weeds and grasses from growing, YOU MUST SPRAY THE ENTIRE AREA you want to [control/ keep free of weeds], NOT JUST the [emerged/ existing] weeds.

[Insert Brand Name/ This Product] [Dual Action/ Formula] Works [2/ Two] Ways:

1. [[Glyphosate/ Insert Brand Name/ This product] [is absorbed by the weed's leaves/ enters plants through the foliage]. It moves through the weed to the root, stopping the production of an essential enzyme found in plants [, but not in humans or animals].]

[Both glyphosate and diquat cause weeds to begin to yellow and wilt within [12] hours, with complete kill in 1 to 2 weeks.]

[Weeds die, roots and all – so they don't grow back.]

2. [Imazapic [prevents new weeds from growing for up to 1 year by creating an invisible barrier in the soil.]

Alternate text: [Imazapic [creates/ provides] an invisible barrier in the soil that prevents growth of [new] [weeds/ seeds/ and grasses] [from/ sprouting/ germinating/ appearing/ growing] for up to 1 year.]

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Always read and follow label directions.

WHERE TO USE [Insert Graphics]

[Apply/ spray] [Insert brand name/ this product] to BOTH existing weeds **and** [weed-prone] areas where weeds have not yet appeared. [Treated areas stay/ Keeps treated areas] weed free for up to 1 year.

Alternate text: [Apply only where you want to kill existing weeds AND prevent future weed growth for up to 1 year, such as:]

- On cracks and crevices in [driveways/ sidewalks/ and/ walkways]
- Patios and paths
- [Along fences/ fence lines] [foundations/ and/ curbs]
- [Gravel areas /gravel pathways/ [RV and boat] parking areas/ decorative rock]
- [Along retaining walls and landscape borders]
- [On [walkways/ driveways/ gravel pathways/ [RV and boat] parking areas/ under decks/ and/ [brick/ paver] patios/ paths]]

[**NOTE:**] In heavy clay soils, plant growth may be prevented for more than one year. In areas of heavy rainfall, applications every 6-8 months may be necessary. To avoid damage to desirable plants, DO NOT apply over their root systems. For shrubs and trees, DO NOT apply closer than twice the distance from the trunk to the drip line as roots may be within this area. [Insert Graphic showing tree drip line]

WHERE NOT TO USE [Insert Graphics]

- DO NOT SPRAY plants or grasses you like – they will die.
- DO NOT USE in areas that will be planted or seeded within 1 year.
- DO NOT SPRAY landscaped areas around young plants or in areas next to any desirable plants or grasses.
- DO NOT USE over the root zone of desirable trees or shrubs.
- DO NOT USE on steep slopes as movement on soil surface may damage desirable plants down the slope.
- DO NOT SPRAY next to a fence if desirable plants and grasses are growing on the other side.
- DO NOT USE in lawns or for lawn renovation as this product prevents desirable grasses from growing too.
- DO NOT USE for vegetable garden preparation or in and around fruits and vegetables.

NOTE: For weed control in these areas use an EPA registered product approved for the use sites listed above; such as [Insert Brand Name for EPA# 71995-33] [or] [Insert Brand Name for EPA# 71995-25].

For Quick Connect, Battery Operated Sprayers and Refill Containers Only:

HOW TO ASSEMBLE AND USE INSTRUCTIONS

[Insert Applicator Name or Packaging Type/ Directions] [Insert Instructions & Graphics from Appendix 3]

For Ready-To-Use Refill Containers Only

[REFILL DIRECTIONS]

[This product can be used as a refill in [2/ two] ways:] [1.] Use this product to refill the empty [Insert Brand Name for EPA# 71995-51] container by pouring product carefully and directly into the container. DO NOT add water. [2.] [Insert Applicator Name] can be reused with this [refill] [bottle/ container]. Follow the instructions below to disconnect the [Insert Applicator Name/ wand] from the [empty] [bottle/ container] and reconnect to the cap on this [bottle/ container].]

HOW TO APPLY [Insert Graphics] *Select applicable packaging type below*

Pump 'N Go® 2 and Battery Operated Sprayers

- Follow illustrations and/or instructions in the How to Assemble and Use Instructions section to prime the sprayer.
- Spray the existing weeds AND the entire surrounding weed-prone area you want to keep [weed free/ free of weeds] for up to 1 year. Spray the area until **thoroughly wet**.

Alternate Text: [To keep areas weed free for up to 1 year, spray the [entire/ desired/ weed-prone] area until **thoroughly wet**.]

Alternate Text: [Spray [existing/ emerged] weeds and the entire surrounding [weed-prone] area where weeds or grasses you want to kill normally appear until **thoroughly wet**. Spray only the areas you want keep free of weeds for up to 1 year].

- When applying [this product] to [targeted/ weed-prone/ treatment] areas, shield desirable plants from drift with a sheet of cardboard or plastic.] If desirable plants are accidentally sprayed, rinse off immediately with water [or cut off the treated area].

Quick Connect Sprayers and Trigger Sprayers

- Adjust [sprayer] nozzle to the desired spray setting [(Spray or Stream)].
- Spray the existing weeds AND the entire surrounding weed-prone area you want to keep [weed free/ free of weeds] for up to 1 year. Spray the area until **thoroughly wet**.

Alternate Text: [To keep areas weed free for up to 1 year, spray the [entire/ desired/ weed-prone] area until **thoroughly wet**.]

Alternate Text: [Spray [existing/ emerged] weeds and the entire surrounding [weed-prone] area where weeds or grasses you want to kill normally appear until **thoroughly wet**. Spray only the areas you want keep free of weeds for up to 1 year].

- When applying [this product] to [targeted/ weed-prone/ treatment] areas, shield desirable plants from drift with a sheet of cardboard or plastic.] If desirable plants are accidentally sprayed, rinse off immediately with water [or cut off the treated area].

WHEN TO APPLY [Insert Graphics]

- For best results, apply during warm, sunny weather above 60° F [to accelerate systemic movement from foliage to roots].
- [Apply/ Spray] when air is calm to prevent drift to desirable plants.
- RAINPROOF [Protection]: Rain or watering 30 minutes after application will NOT wash away effectiveness.
Alternative Text: [Insert Brand Name] is Rainproof in 30 minutes.]
- [Weeds yellow and wilt within 12 hours with complete kill in 1 to 2 weeks.]

APPLICATION RESTRICTIONS: Do not apply this product in a way that will contact any person or pet, either directly or through drift. Only persons applying this product may be in the area during application.

User Safety Recommendations:

- Clothing and protective equipment exposed to this product should be washed in detergent and hot water. Such items should be kept and washed separate from other laundry.
- Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Users should remove clothing immediately if product gets inside; then wash thoroughly and put on clean clothing.

Entry Restrictions: People and pets must not touch treated plants or enter treated areas until after spray has dried.

WHEN TO REPLANT [Insert Graphics]

All ornamental bedding plants [(annuals and perennials)], trees, shrubs, sod and seed [(flowers and grasses)] can be planted **1 year after** application.

Optional Section:

HOW TO REFILL

For Ready-To-Use Containers with Applicators Intended to be Reused/ Refilled

- This container and sprayer can be reused.
- To refill this empty container, pour product carefully and directly from the [Insert Brand Name for EPA# 71995-51] container designated as the ready-to-use refill container. DO NOT add water.
- Use [Insert brand name for EPA# 71995-49] to refill the container. [Insert Applicable Container Size Instructions from List below]

24 fl oz Trigger Sprayer:

Add 1.125 fl oz (7 Tsp) of [Insert brand name for EPA# 71995-49] to this empty container and then fill with water slowly to avoid foaming.

64 fl oz:

Add 3 fl oz (6 Tbs) of [Insert brand name for EPA# 71995-49] to this empty container and then fill with water slowly to avoid foaming.

1 Gallon:

Add 6 fl oz (12 Tbs) of [Insert brand name for EPA# 71995-49] to this empty container and then fill with water slowly to avoid foaming.

1.33 Gallon:

Add [the pre-measured bottle] [8 fl oz (16 Tbs)] of [Insert brand name for EPA# 71995-49] to this empty container and then fill with water slowly to avoid foaming.

1.5 Gallon:

Add 9 fl oz (18 Tbs) of [Insert brand name for EPA# 71995-49] to this empty container and then fill with water slowly to avoid foaming.

For Battery Operated Sprayers with Wand containers

- The [Insert Applicator Name/ wand] can be reused with the [Insert Brand Name for EPA# 71995-51] refill [bottle/ container]. Read and follow instructions in REFILL DIRECTIONS section to reuse the [Insert Applicator Name/ wand/ applicator].

Optional Section: Battery Operated Sprayer ONLY Select Any of the Options Below

HOW TO CLEAN:

- [Battery operated [wand/ Insert Applicator Name] may be used with other Roundup brand products, it will replace any sprayer fitted with a quick-connect cap.]
Alternative Text: [Before using the [wand/ Insert Applicator Name] with other Roundup brand products, clean the sprayer thoroughly.]
- [Disconnect sprayer unit from the [quick-connect/ bottle] cap.]
- [Place ONLY the end of the hose into a bucket of water and spray continuously for 30 seconds onto [bare soil or gravel/ treated area].]
Alternative Text: [Rinse sprayer and sprayer parts including the [hose/ cone/ dome/ guard/ shield] with water 3 times. Spray rinse water on [bare soil or gravel/ treated area]. Discard empty sprayer bottle as instructed in DISPOSAL section.]
Alternative Text: [Rinse sprayer with water 3 times and then spray [clean] water through sprayer for 30 seconds.] [Spray rinse water on [bare soil or gravel/ treated area].]
- [Connect [wand/ Insert Applicator Name] to any Roundup brand product with a quick-connect cap.]
- [Failure to properly clean sprayer before using with other Roundup brand products may cause damage to your plants.]

Optional Section: Select from the list below

KILLS AND PREVENTS ALL TYPES OF [TOUGH] WEEDS AND GRASSES [Insert Graphics]

Kills and prevents [insert from the list below] [and other broadleaf/ [and/ &] grassy weeds] [for up to 1 year].

Alternative Text: [Controls [common] weeds and grasses [brush] [including]/ [Common] Weeds [grasses/ [&/ and]/ brush] controlled [include:]] [Bermudagrass, Black Medic, Buckhorn Plantain, Buttercup, Common Purslane, Curly Dock, Crabgrass, Dandelion, Kentucky Bluegrass, Lambsquarters, Morning Glory, Perennial Ryegrass, Spotted Spurge, Fescue, White Clover, and Yellow Nutsedge [insert from the list below] [and other broadleaf [and/ &] grassy weeds [brush]]].

Annual Weed Control *Alternative Text:* [Annuals/ Annual Weeds/ [&/and]/ Grasses] [(Continued)]

Annual Ryegrass	Diffuse Lovegrass	Kochia	Sowthistle (annual)
Barnyardgrass	Dog Fennel	Lambsquarters	Spotted Spurge
Bittercress	Evening Primrose	Little Bitter Cress	Sprangletop
Black Medic	Fall Panicum	London Rocket	Stinkgrass
Black Nightshade	Fiddleneck	Maiden Cane	Sunflower
Bluegrass (annual)	Field Pennycress	Mallow	Swinecress
Blue Mustard	Field Sandbur	Mayweed	Tansy Mustard
Blue Toadflax	Filaree	Morning Glory (annual)	Tansy Ragwort
Brassbuttons	Florida Pusley	Pennsylvania Smartweed	Teaweed
Bromegrass	Garden Spurge	Prickly Lettuce	Texas Panicum
Buckwheat	Giant Foxtail	Prostrate Spurge	Tumble Mustard
Bur Clover	Giant Ragweed	Puncture Vine	Velvetleaf
Burcucumber	Goosegrass	Purslane	Virginia Pepperweed
Buttercup	Green Foxtail	Purslane Speedwell	Wild Buckwheat
Carolina Geranium	Hairy Nightshade	Redroot Pigweed	Wild Mustard
Cheat	Hemp Sesbania	Russian Thistle	Wild Oats
Chickweed (Common)	Henbit	Sandspur	Wild Proso Millet
Chickweed (Mouseear)	Horseweed/ Marestail	Shattercane	Witchgrass
Cocklebur	Itchgrass	Shepherd's-purse	Wooly Cupgrass
Common Groundsel	Jimsonweed	Sicklepod	Yellow Foxtail
Crabgrass	Junglerice	Smooth Cat's Ear	Yellow Rocket
Creeping Beggarweed	Knotweed	Smooth Pigweed	

[Tough] Perennial Weed Control *Alternative Text: [Perennials/ Perennial Weeds/ Grasses/ [&/and]/ Tough/ Brush] [(Continued)]*

Alder	Dallisgrass	Maple	Smooth Brome grass
Artichoke Thistle	Dandelion	Milkweed	Sourwood
Ash	Dewberry	Nimblewill	Sowthistle (perennial)
Aspen (quaking)	Dogwood	Nutsedge	Spurred Anoda
Bahiagrass	Dollarweed	Oak	St. Augustine grass
Bamboo	Elderberry	Oldenlandia	Sumac
Bermudagrass	Elm	Orchardgrass	Swamp Smartweed
Blackberry	Eucalyptus	Oxalis	Sweetgum
Blackgum	False Dandelion	Pampasgrass	Tan Oak
Black Locust	Fennel	Pennywort	Thimbleberry
Bluegrass (Kentucky)	Fescue species	Perennial Ryegrass	Timothy
Bluegum Eucalyptus	Field Bindweed	Persimmon	Torpedograss
Brackenfern	Giant Reed	Pine	Tree Tobacco
Broadleaf Plantain	Guineagrass	Poison Hemlock	Trumpet creeper
Broom (French, Scotch)	Hawthorn	Poison Ivy	Vaseygrass
Buckhorn Plantain	Hazel	Poison Oak	Virginia Creeper
Canada Thistle	Hemp Dogbane	Poison Sumac	White Clover
Cattail	Honeysuckle	Poplar	Whitetop
Ceanothus	Horsenettle	Primrose	Wild Barley
Chamise	Horseradish	Purple Nutsedge	Wild Blackberry
Cherry	Iceplant	Quackgrass	Wild Oats
Cogongrass	Johnsongrass	Raspberry	Wild Rose (multiflora)
Common Mullein	Kikuyugrass	Ragweed (Common)	Wild Sweet Potato
Common Pokeweed	Knapweed	Red Clover	Wild Violet
Corn Speedwell	Kudzu	Redvine	Willow
Coyote Brush	Lantana	Reed Canarygrass	Wirestem Muhly
Creeping Bentgrass	Leafy Spurge	Sage	Yellow Nutgrass Nutsedge
Creeping Charlie	Locust	Salmonberry	Yellow Poplar
Crowfootgrass	Lovegrass	Saltcedar	Yellow Starthistle
Curly Dock	Madrone	Sassafras	Zoysia

[NOTE: Heavy lawn grass or well established difficult to control weeds, such as Bermudagrass, Nimblewill, Dandelion, or Canada Thistle may require a repeat application.]

STORAGE AND DISPOSAL *Select applicable packaging type below:*

Battery Operated Sprayer Containers:

PESTICIDE STORAGE: Flip spout down. *Alternative Text:* [Close [Insert Color] spout on cap/ [Turn/ Twist] [spout/ knob] on cap to OFF/ Push spout down]. **NO NEED TO DISCONNECT SPRAYER HOSE FROM CAP.** Close nozzle on trigger sprayer. [Engage trigger lock.] [Retract and] Flip the [wand/ Insert Applicator Name] closed and place back in side [carrier/ clip/ holder]. Store product in original container in a safe place away from direct sunlight. Keep from freezing. If frozen, allow to thaw and shake well before using.

Non-Sprayer (Refill) Containers:

PESTICIDE STORAGE: Store product in original container in a safe place away from direct sunlight. Keep from freezing. If frozen, allow to thaw and shake well before using.

Pump 'N Go® 2 Sprayer Containers:

PESTICIDE STORAGE: Push the [Insert Color/ yellow] button and retract the wand until the [Insert Color/ yellow] button snaps back into the original STORAGE POSITION. Place wand back onto [the top of] the bottle [in the integrated holster] with nozzle [facing down/ tip extended through the eyelet opening]. Push pump handle all the way down and turn pump handle and cap counter-clockwise to relieve pressure, then retighten to store. Store product in original container in a safe place away from direct sunlight. Keep from freezing. If frozen, allow to thaw and shake well before using.

Quick Connect Sprayer Containers:

PESTICIDE STORAGE: Flip spout down. *Alternative Text:* [Close [Insert Color] spout on cap/ [Turn/ Twist] [spout/ knob] on cap to OFF/ Push spout down]. **NO NEED TO DISCONNECT TRIGGER SPRAYER.** Close nozzle on trigger sprayer. Snap sprayer back in place. *Alternative Text:* [Place sprayer back in side [carrier/ clip/ holder]. Store product in original container in a safe place away from direct sunlight. Keep from freezing. If frozen, allow to thaw and shake well before using.

Trigger Sprayer Containers:

PESTICIDE STORAGE: Rotate nozzle to closed position. Store product in original container in a safe place away from direct sunlight. Keep from freezing. If frozen, allow to thaw and shake well before using.

For Containers with Refill Instructions:

PESTICIDE DISPOSAL AND CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container unless the directions for use allow a different concentrated or ready-to-use product to be diluted in or poured directly into the container. Reuse or refill this container according to the directions contained in the [HOW TO REFILL] section.

For Containers without Refill Instructions:

PESTICIDE DISPOSAL AND CONTAINER HANDLING: Nonrefillable container. Do not reuse or refill this container. [Insert Applicator Name/ Comfort Wand/ Sure Shot Wand] can be reused with [this] [Insert Brand Name for EPA# 71995-51] [refill] [bottle/ container]. [Follow instructions in the REFILL DIRECTIONS section when reusing the [Insert Applicator Name/ wand].

ALL Packaging Types:

If Empty: Place in trash or offer for recycling, if available. **If Partly Filled:** Call your local solid waste agency [or Insert Telephone Number] for disposal instructions. Never place unused product down any indoor or outdoor drain.

PRECAUTIONARY STATEMENTS [Insert Graphics]**HAZARDS TO HUMANS & DOMESTIC ANIMALS****KEEP OUT OF REACH OF CHILDREN**

CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

[Re-entry icon]

People and pets must not touch treated plants or enter treated areas until after spray has dried.

FIRST AID	
IF IN EYES	<ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15-20 minutes.• Remove contact lenses, if present, after first 5 minutes, then continue rinsing eyes.• Call a poison control center [Insert Telephone Number] or doctor for treatment advice.
EMERGENCY MEDICAL INFORMATION	
<ul style="list-style-type: none">• Have the product container or label with you when calling a poison control center or doctor, or going for treatment.• You may contact [Insert Telephone Number] for emergency medical treatment information.• This product is identified as [Insert Brand Name], EPA Reg. No. 71995-51.	

ENVIRONMENTAL HAZARDS:

To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Diquat is toxic to aquatic invertebrates. Do not apply directly to water. Imazapic demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of this product in areas where soil is permeable, particularly where the water table is shallow, may result in groundwater contamination.

NOTICE: To the extent consistent with applicable law, buyer assumes all responsibility for safety and use not in accordance with directions.

[Guaranteed Satisfaction.*]

Optional Section

***CONSUMER GUARANTEE**

If for any reason you are not satisfied after using this product, simply send us original proof of purchase and we will [replace the product or] refund the purchase price.

Optional Section

ROUNDUP BRAND FAMILY OF PRODUCTS

Visit the Roundup website, [\[www.roundup.com\]](http://www.roundup.com), to learn more about the Roundup brand family of products for the best solutions to your toughest weed problems.

Alternative Text: **[Roundup® Lawn & Garden products have the best solutions to your toughest weed problems.] [Visit the Roundup website, [\[www.roundup.com\]](http://www.roundup.com), to learn more about the Roundup brand family of products.]**

[Insert Graphic- Roundup Product Family Photo]

- [Roundup Extended Control Weed & Grass Killer products] [– kill & prevent weeds for up to 4 months]
- [Roundup Max Control 365 products] [– kill & prevent weeds for up to [1 year/ 12 months]]
- [Roundup Ready-To-Use Weed & Grass Killer III/ Insert Brand Name for EPA# 71995-33] [– no mixing, no mess]
- [Insert Brand Name for EPA# 71995-33] [– kill weeds, protect desirable plants.]
- [Roundup Poison Ivy Plus Tough Brush Killer products] [– kill tough, brushy, hard-to-control weeds]
- [Roundup Wild Blackberry Plus Vine & Brush Killer products] [– kill tough brush & vines]
- [Insert Brand Name for EPA# 71995-29] [– [fast visible results]
- [Insert Brand Name for EPA# 71995-25] [– best Roundup brand concentrate value]
- [Insert Brand Name for EPA# 71995-60] [– targets hard to spray weeds]

Optional Spanish Translations:

[Insert generic logo and brand name in English & Spanish]

[Insert Label Language in Spanish as Applicable]

Base Label Information:

[Insert generic logo and brand name in English & Spanish]

Insert applicable instruction along side of base label:

[Resealable Label for Directions & Precautions / Etiqueta resellable de instrucciones y avisos de precaución.]

Alternative Text: [Open Booklet for Assembly and Use Instructions / Abra la etiqueta para las instrucciones para ensamblar y para usar.]

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

KEEP OUT OF REACH OF CHILDREN

CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

[Re-entry icon]

People and pets must not touch treated plants or enter treated areas until after spray has dried.

FIRST AID	
IF IN EYES	<ul style="list-style-type: none">• Hold eye open and rinse slowly and gently with water for 15-20 minutes.• Remove contact lenses, if present, after first 5 minutes, then continue rinsing eyes.• Call a poison control center [Insert Telephone Number] or doctor for treatment advice.
EMERGENCY MEDICAL INFORMATION	
<ul style="list-style-type: none">• Have the product container or label with you when calling a poison control center or doctor, or going for treatment.• You may contact [Insert Telephone Number] for emergency medical treatment information.• This product is identified as [Insert Brand Name], EPA Reg. No. 71995-51.	

ENVIRONMENTAL HAZARDS:

To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Diquat is toxic to aquatic invertebrates. Do not apply directly to water. Imazapic demonstrates the properties and characteristics associated with chemicals detected in ground water. The use of this product in areas where soil is permeable, particularly where the water table is shallow, may result in groundwater contamination.

Insert Applicable Storage and Disposal Statements from Section above per Packaging Type

[Insert phone & computer icons]

Questions, Comments or Information

1-800-246-7219 www.roundup.com

Preguntas, Comentarios o Información

©[Insert Year] [MONSANTO COMPANY] [Insert Company Name]

[Produced/ Manufactured/ Distributed] [for/ by]] [Monsanto Company

Lawn & Garden Products] [Insert Company Name]

[P.O. Box 418 Marysville, OH 43041] [Insert Address]

EPA Reg. No. 71995-51

EPA Est. 239-IA-3^l, 239-MS-001^M [Insert Additional Establishments]

Superscript is first letter of lot number

[Made in/ Manufactured in/ Produced in/ Assembled in/ Product of] [USA/ [Insert Country] [with [insert# %] or more US parts/ with over [insert# %] US parts/ with foreign and domestic parts]]

Anti-theft device statement: [This [bottle/ package] [may] contain[s] an anti-theft device [, either inside or on the back of the [bottle/ package]]. [It does not affect product performance.]]

[Insert Relevant Trademark Disclosure Statement(s)]

[Insert Relevant Patent Information Statement(s)] [For a list of patents, if any, covering this product or its use, please go to [insert patent website/ www.monsantotechnology.com/lawnandgarden].]

[Insert 2D Code/ PPN code/ Insert LB code] [UPC Code/ Proof of Purchase]

APPENDIX 1: Consolidated List of Label Claims

- *Product guarantee statement for use throughout** [Guaranteed Satisfaction/ Consumer Guarantee] If for any reason you are not satisfied after using this product, simply send us the original proof of purchase and we will [replace the product or] refund the purchase price.
- 2 in 1 [kills and prevents]
- Absorbed into both broadleaf and grassy weeds
- Absorbs on contact, starts working immediately
- Absorbed through the leaves, it goes all the way to the root for total kill [on weeds you directly spray]
- Apply [one time/ once] to kill and prevent [for up to/ 1 year/ 365/ 12 months]
- Before [Insert Graphic of live weed] / After [Insert Graphic of dead weed]
- Begins absorbing on contact
- Begins to work in [Insert value between 1 and 24] hours
- Begins working in hours
- Binds to soil and prevents weeds where applied
- Blocks weed[s] [growth] [for up to/ 1 year/ 12 months]
- [Can be used [on/ along]/ For use [on/ along]] [cracks/ and/ crevices/ in] [driveways/ sidewalks/ walkways/ driveway cracks/ sidewalk cracks/ brick/ paver/ patios/ paths/ gravel [areas/ paths/ driveways]/ decorative rock/ fences/ foundations/ curbs/ retaining walls/ landscape borders/ [RV and boat] parking [areas/ lots]/ under decks]
- Completely kills even the toughest weeds and grasses
- *CONSUMER GUARANTEE: If for any reason you are not satisfied after using this product, simply send us original proof of purchase and we will [replace the product or] refund the purchase price.
- Consumer Guarantee* [see/ open] booklet for details.] *qualify guarantee*
- Controls tough weeds longer than other Roundup brand products [*longer than Roundup® Ready-To-Use Extended Control Weed & Grass Killer Plus Weed Preventer II]
- Dead Weeds Guaranteed* [or Your Money Back] *qualify guarantee*
- Delivers maximum performance: Kills tough weeds and grasses to the root, prevents new weeds and grasses for up to 1 year; visible results in 12 hours; rain-proof protection in 30 minutes
- Do NOT add water
- [Driveways/ Patios/ Sidewalks] Stay[s] clear [of weeds] for up to [1/ a] year
- Dual [2-way] Action [kills and prevents]
- Dual [2-way] Action: Kills existing weeds [roots and all] and prevents new weeds from appearing for up to [1 year/ 12 months/ 52 weeks/ 365 days]
- Even if it rains – [Roundup brands/ Insert Brand Name] won't lose effectiveness
- Exclusive [Roundup brand/ Insert brand name] formula
- Exclusive formula won't be washed away by rain or watering 30 minutes after treatment.
- Extended weed control
- FastAct® [II] [Technology] [– Results in 12 Hours!]
- Fast acting [formula]
- Fast-acting for visible results in 12 hours
- For [outdoor] residential use [only]
- For use on driveways, patios, sidewalks & gravel [areas/ paths]
- Goodbye weeds
- Got Tough Weeds – Get [Insert brand name/ Roundup Max Control 365/ products]
- Great value – covers up to [Insert Value from Appendix 2 table] sq ft
- Guaranteed effective: Kills weeds and grasses, roots and all, with just one application
- Guaranteed* [results/ satisfaction] [[see/ open] booklet for details.] *qualify guarantee*
- Guaranteed* results [with one application] *qualify guarantee*
- Hard on weeds, easy on you
- Ideal for killing and preventing unwanted weeds and grasses. Use along fences, retaining walls; in cracks of walks, driveways and patios.
- It's your year!™
- Keeps driveways, walkways, patios and weed-free for up to [1 year/ 12 months/ 52 weeks/ 365 days]
- Keeps weeds from growing [for up to [1 year/ 12 months]
- Kills all [annual and perennial] weeds, grasses and other unwanted plants

- **Kill and prevent unwanted weeds** and grasses. Use along fences, retaining walls; in cracks of walks, drives and patios
- Kills and prevents for up to [1 year/ 12 months/ 52 weeks/ 365 days]
- Kills existing tough weeds [& grasses] [to the root/ roots and all]
- Kills even the toughest weeds
- Kills over 200 [different/ types/ species/ kinds/ of] of weeds[*] [*/(as listed)/ as listed/ below/ on the [product] label]
- Kills [to] the root[s] so [treated] weeds don't come back
- Kills the root[s] [so weeds don't come back] [first time, every time] [guaranteed] *qualify guarantee*
- Kills [to] the roots [Guaranteed[!/*]] *qualify guarantee*
- Kills [the toughest/ weeds and grasses] to the root so [weeds/ they] don't come back
- Kills the roots of [both] broadleaf and grassy weeds
- Kills the weed you see and the root you don't
- Kills the weeds [& grasses] you see [roots & all] and prevents [new] [weeds/ seeds] [from/ sprouting/ germinating/ appearing] for up to 1 year
- Kills unwanted weeds [and grasses]
- Kills vegetation [weeds/ and grasses] for up to [1 year /12 months/ 52 weeks/ 365 days]
- Kills weeds [and grasses] [clear/ down to the root] [1-2 weeks] [roots and all]
- Kills weeds [and unwanted grasses] – roots and all
- Kills weeds clear down to the root, 1st time, every time so weeds don't come back – guaranteed *qualify guarantee*
- Kills weeds dead
- Kills weeds and grasses in – Patios – Driveways – Walkways – Gravel Areas
- Kills weeds, roots and all
- Kills what you directly spray
- Long lasting weed & grass control
- Longest lasting Roundup brand formula
- Multipurpose grass and broadleaf weed control
- [Next day/ this weekend] results: Begins killing on contact, visible results in 12 hours
- No more hand pulling
- No Root, No Weed, No Problem®
- Non-staining [formula]
- Not for sale or sales into the state of New York
- Not registered for sale or use in New York
- [One application] Kills [existing] weeds [& grasses] [roots & all] and prevents [new] [weeds/ seeds] [from sprouting/ germinating/ appearing/ growing] for up to [1 year/ 12 months/ 365 days]
- One [application/ spray] kills weeds and grasses, roots and all [maximum effectiveness]
- One [application/ spray] kills weeds [to the root] and prevents [new] weeds for up to [1 year/ 12 months/ 365 days]
- [One/ 1] [step/ stop] [weed] protection [for up to/ 1 year/ 12 months/ 365 days/ 52 weeks]
- Outdoor use only [Insert Graphic]
- [Patented] FastAct® [II] Technology
- Powerful protection against weeds [for up to/ 1 year/ 12 months/ 52 weeks/ 365 days]
- Product goes on clear and [dries clear/ stays clear/ will not stain]
- Prevents [growth/ re-growth/ new growth] for up to [1 year/ 12 months/ 365 days/ 52 weeks]
- [Protects against/ Prevents] [new] weeds [for up to/ 1 year/ 12 months/ 52 weeks/ 365 days]
- Protects [against weeds] [up to/ 3[X]/ 300%] longer* [than current brand/ than original]* *than Roundup Extended Control Ready-To-Use Weed & Grass Killer Plus Weed Preventer II
- Proven performance: Roundup brands work the first time, every time – and have for [more than/ 30/ insert # years] years
- Provides maximum control: Kills existing weeds to the root so they don't come back
- Provides extended [up to 1 year/ 12 months] control of weeds in driveways, walkways and patios
- [Provides] [visible] results in 12 hours
- [RainFast/ RAINPROOF/ Rainproof Protection:] in 30 minutes [for control that won't wash away]
- [Roundup brand's/ Our] longest lasting formula
- [Roundup Max Control 365 products/ Roundup brand/ Insert Brand Name] can be used on patios, walkways, driveways, gravel areas and along fences

- [Roundup Max Control 365 products/ Insert Brand Name] create[s] an invisible [weed] [shield/ barrier] for up to [1 year/ 12 months/ 365 days/ 52 weeks]
- [Roundup Max Control 365 products/ Insert Brand Name] [is/ are] [Relentless in the fight against weeds [for up to/ 1 year/ 12 months/ 52 weeks/ 365 days]
- [Roundup Max Control 365 products/ Roundup brand[s]/ Insert Brand Name] [is/ are] tougher than the toughest weed
- [Roundup Max Control 365 products/ Roundup brand's] [are the/ most] [advanced/ powerful] formula [[to protect against/ to prevent] weeds] [for up to/ 1 year/ 12 months/ 52 weeks/ 365 days]
- Roundup's exclusive formula won't be washed away by rain or watering 30 minutes after treatment
- Roundup's exclusive [patented] [FastAct®] [II] [technology] formula kills to the root so weeds don't come back
- Same great formula!
- Satisfaction guaranteed* [or/ we will gladly refund purchase price/ your money back with proof of purchase] *qualify guarantee*
- So long weeds
- Spray today, dead tomorrow
- [Spray weeds/ Use] on [brick/ paver] patios, paths, sidewalks, sidewalk cracks, walkways and driveways
- Spray the [weed/ leaves] to kill the root
- Starts to kill [in hours/ the same day/ overnight]
- Starts working [immediately/ in Insert # hours/ overnight]
- Systemic [weed/ and grass] killer for spot treatment of undesirable vegetation
- The fast & easy way to kill and prevent weeds for up to [1 year/ 12 months/ 52 weeks/ 365 days]
- Tough formula [kills to the roots]
- Tougher than the toughest weeds
- Unlike hand pulling, Roundup kills all the way to the roots
- Up to [1 year/ 12 months/ 52 weeks/ 365 days] without weeds
- Use along fences, on paths, patios, sidewalks, driveways, and on brick or gravel areas
- Use on [driveways/ sidewalks/ patios/ brick walks/ gravel paths/ fence lines] to prevent [weed growth/ weeds from growing] [for up to/ 1 year/ 12 months/ 365 days/ 52 weeks]
- Visible effects are gradual wilting and yellowing advancing to complete browning and root destruction
- Visible Results in 12 Hours!
- Visible results in 12 hours, weed free for up to [1 year/ 12 months/ 52 weeks/ 365 days]
- Weed Barrier [protection/ technology]
- [Weeds won't grow for] up to [1 year/ 12 months/ 52 weeks/ 365 days] [without weeds]
- Weed Preventer
- Works first time, every time [guaranteed] *qualify guarantee*
- Works on [Insert or Select from Weed List]
- [Year long/ 12 month/ 52 week/ 365 day] weed control

Promotional Offering Options

- [Insert value]% Free [More] [than X] *qualify*
- [Insert value]% More in Each Bottle
- [Insert value]% More Value size [than X] *qualify*
- [Insert #] [Concentrate] Bottle[s] [Included/ Attached]
- [Insert #] [Concentrate] Refill[s] [Included/ Attached]
- [Insert #] Pre-Measured [Concentrate] [Refill/ Bottle[s]] [Included/ Attached]
- [Insert #] Refill[s] [Included/ Attached]
- [Insert Dollar Amount] Rebate
- A [Insert Dollar Amount] Value
- Bonus [Size/ Pack/ Pak]
- BONUS SIZE [Insert Value]% MORE! *qualify*
- Bundle Pack
- Can be used in [Insert Packaging Type/ Container/ Sprayer]
- Can be used to REFILL [Insert Packaging Type/ Container/ Sprayer]
- Club [Pack/ Pak/ Size]
- Combo [Pack/ Pak/ Size]
- [CONE/ DOME/ GUARD/ SHIELD] INCLUDED!
- Easy Mix Refill System
- Free Concentrate
- FREE [CONE/ DOME/ GUARD/ SHIELD]
- Free [Insert Description] with this purchase of [Insert Brand Name] [Insert Container Size]
- FREE REFILL [with purchase [of Insert Brand Name]]
- FREE [Insert Brand Name] a [Insert Dollar Amount] [VALUE]
- Free [Insert Container Size] [Insert Brand Name] [Concentrate/ Refill] [Included/ Attached/ Inside/ With Purchase/ Coupon]
- FREE [Insert Brand Name] SAMPLE [Included/ Attached/ Inside/ With Purchase]
- FREE SAMPLE
- Great Value
- Larger size [covers up to [Insert value from Appendix 2] sq ft]
- NEW! *Use only if new package or formulation*
- NOT FOR INDIVIDUAL SALE
- NOW! *Use only if new package or formulation*
- [Part of] [Easy Mix] Refill [System]
- [Pre-Measured] [Concentrate] [Bottle/ Refill] makes [up to] 1.33 Gallons/ Insert Product Size]
- Ready-To-Use
- Refill [Included]
- Refill Size
- Refill System
- [Insert Packaging Type/ Sprayer] Refill
- SAMPLE NOT FOR SALE
- Save up to \$[Insert Value] on [your] next purchase
- TWIN [PACK/ PAK]
- Value [Pack/ Pak]
- VALUE [SIZE/ SIZED]

APPENDIX 2: Packaging Related Claims

Calculation of Spray Coverage

- To determine how many square feet can be treated, divide the number of fluid ounces by 128 and multiply by 300 ($X = \text{Net contents (fl oz)} \div 128 \times 300 \text{ sq ft}$)

NET CONTENT SKU Size	Spray Coverage
24 FL OZ [(1 PT 8 FL OZ/ 1.5 PT)]	• Treats up to 56 sq ft
30 FL OZ [(1 PT 14 FL OZ/ 1.875 PT)]	• Treats up to 70 sq ft
64 FL OZ [(½ GAL/ 2 QT)]	• Treats up to 150 sq ft
1 GALLON [(128 FL OZ)]	• Treats up to 300 sq ft
1.1 GALLON [(141 FL OZ)]	• Treats up to 330 sq ft
1.25 GALLON [(160 FL OZ)]	• Treats up to 375 sq ft
1.33 GALLON [(170 FL OZ)]	• Treats up to 400 sq ft
1.5 GALLON [(192 FL OZ)]	• Treats up to 450 sq ft

Other Packaging Related Claims

General:

- Accurate
- Accurately targets [what/ the weeds] you want to [spray/ kill]
- Accurately targets [precisely/ exactly] [what/ the weeds] you want to [spray/ kill]
- Adjustable [spray/ sprayer] nozzle for maximum control
- Adjustable spray pattern for maximum control
- [Applicator/ Application] [Device/ System]!
- [Insert Brand Name of Batteries] Batteries included
- Battery Operated
- Be smarter than you weeds
- Change the way you spray
- Convenient
- No Mix[ing], No Mess
- No Mixing [necessary] [No measuring]
- [Easy/ Convenient] To Use
- Easy to store
- EASY-TO-USE [Insert Applicator Name]
- Easy to use [convenient/ handy/ useful]
- Fast and easy [application/ way to spray]
- Give your hands a break
- Great for large or small [jobs/ areas]
- Ideal for large or small [jobs/ areas]
- Handy
- It's always ready to spray
- No leaks or mess
- [Precise/ Precision] control – [sprays/ targets/ only what you want]
- [Precise /Precision] control for maximum accuracy
- Pre-mixed, pre-measured, easy-to-use
- Power Up with Duracell® [Batteries]
- Powered by Duracell® [Batteries]
- Quick [&/ and] easy to use
- Recycle symbol [Insert Graphic]
- Redesigned [Insert Applicator Name/ Sprayer]
- Refillable [Container]

- Requires no mixing
- [Save/ Saves] time and energy
- Targeted spray
- Targets weeds [in tight/ hard to reach/ places]
- The easy way to kill [and prevent] weeds [for up to/ 12 months/ 1 year]
- The easy way to spray
- The fast and easy way to kill [and prevent] weeds [for up to/ 12 months/ 1 year]
- The fast way to spray
- You're always ready to spray

Pump 'N Go® 2 Sprayer:

- [33%/ Insert Value %] More than 1 gallon size
- Consistent spray for maximum accuracy
- Continuous, adjustable spray
- Convenient [extendable wand]
- Cover more ground faster
- Easy to use tank sprayer
- Extendable wand provides greater accuracy without bending over
- Long[er] spray time with less pumping
- No [constant] pumping
- No [More] Hand Fatigue
- No constant trigger [squeezing/ pulling]
- No more pumping, no more pulling, just spray
- No more squeeze, squeeze, squeeze
- No more tired [aching] hands
- One pump [= /equals] [Insert #] trigger sprays
- One pump delivers [Insert #] trigger sprays
- [Insert Applicator Name] [Provides] Up to [Insert #] minutes of continuous spray
- Quickly covers large areas
- Reusable [Pump 'N Go 2] [sprayer/ container]
- [Up to] [10/ insert #] [minutes of] Continuous spray

Refill Container:

- Don't Forget Your Refill
- Just [connect/ plug in] [Insert Applicator Name/ Comfort Wand/ Sure Shot Wand] and it's ready to spray
- Pour refill [directly] into [Insert Packaging Type] [container/ sprayer]
- [Ready-To-Use] Refill [Available]
- [Refills/ Recharges/ Reloads/ Renews] [Insert Applicator Name/ Comfort Wand/ Sure Shot Wand/ Pump 'N Go 2] [sprayer]
- Reuse with [Insert Applicator Name/ Comfort Wand/ Sure Shot Wand]
- The fast and easy way to refill your [Insert Packaging Type] [container/ sprayer]
- There is no mixing and no measuring, you just [pour/ connect] and go
- Works with [Insert Applicator Name/ Comfort Wand/ Sure Shot Wand]

Battery Operated Sprayer with Wand:

- [33%/ Insert Value %] More than 1 gallon size
- Comfort Wand® [with extended reach/ [with continuous spray]
- Consistent spray for maximum accuracy
- Continuous Spray [Wand]
- Continuous spray wand [with extended reach]
- Continuous, adjustable spray
- Easy reach extendable spray wand
- Easy to use tank sprayer
- Extended Reach [Wand]

- Extendable spray wand – less bending
- Extendable [Insert Applicator Name] spray wand
- No [constant] pumping
- No constant trigger [squeezing/ pulling]
- No [More] Hand Fatigue
- No more pumping, no more pulling, just spray
- No more squeeze, squeeze, squeeze
- No more tired [aching] hands
- No more trigger sprayer
- [One-Touch] [Precision] Wand
- Power Sprayer [for large areas]
- Quickly covers large areas
- Reusable [Comfort Wand] [One-Touch Wand] [Insert Applicator Name]
- The powerful way to spray

Battery Operated Sprayer with Extendable Wand:

- [Adds control so] [the spray] [only] goes where you want it to go
- Apply faster with the [extended wand/ Insert Applicator Name]
- [Avoid accidental spray to [surrounding/ nearby] [flowers/ and/ vegetables/ desirable plants]
- [Bending [down/ over] to kill weeds is [a thing of the past/ in the past/ no longer needed]
- [Cone/ Dome/ Guard/ Shield] attaches to the bottle [stores easily] [when not in use]
- [Cone/ Dome/ Guard/ Shield] helps protect [nearby/ desirable plants/ flowers] [from spray/ drift/ damage] [even in windy conditions]
- [Cone/ Dome/ Guard/ Shield] keeps the spray contained so wind won't carry it to [desirable plants/ flowers and shrubs]
- [Cone/ Dome/ Guard/ Shield] helps protect [nearby plants/ desirable plants] [from splashing/ from spray]
- Continuous Spray
- Customize the [wand/ Insert Applicator Name] length [for personal comfort]
- Direct application reduces unintended damage to nearby plants [from the wind] [due to accidental spray]
- Easily get[s] into [deep,] hard-to-reach areas
- Extend
- Extended [Reach/ Continuous Spray] Sure Shot™ Wand [with extended reach/ with continuous spray]
- Extended [Reach/ Continuous Spray] Wand [with extended reach/ with continuous spray]
- [Extended/ Extendable] wand puts more distance between you and the spray
- Extends 2 feet [for more targeted control] [so no more/ bending over/ aching back]
- Focus the spray [where you need it most/ where you want it to go]
- Ideal for [use/ targeting] weeds in hard to reach places
- Ideal for [use/ targeting] weeds on driveways, sidewalks and patios
- [Helps] [Contain/ Isolate/ Target] [the product/ spray]
- [Helps] Keep[s] the spray on the weed
- Helps protect desirable [plants/ vegetation/ flowers/ shrubs/ vegetables]
- [Insert Applicator name] gives you an easy way to kill weeds
- [Just/ Simply] spray the leaves to kill the [weed to the] root
- Helps protects desirable plants [such as flowers and shrubs]
- [Lightweight/ and/ durable] applicator
- [Now it's] [[Protective] [cone/ dome/ guard/ shield] makes it] Easier to kill weeds in more places
- Pinpoint the weeds [you want] to kill
- [Precisely] [Target[s]] [hard to reach/ weeds/ places] [the weeds you want to kill]
- [Precision/ Precise/ Adjustable] sprayer
- [Protective] [cone/ dome/ guard/ shield] helps [focus/ target] the spray on the weed[s]
- [Protective] [cone/ dome/ guard/ shield] [at the end of the wand] fits over the weed [(like an umbrella)] [so the spray is contained/ to help contain the spray]
- [Protective] [cone/ dome/ guard/ shield] fits over weeds to help contain spray [even in windy conditions]
- Reach[es] into [tight/ hard to reach] places [weeds like to grow]
- Reach

- Removable [protective] [cone/ dome/ guard/ shield]
- Reusable [Sure Shot Wand] [Insert Applicator Name]
- [Sprayer provides the best way to] Focus the spray on the leaves [where it does the most [good/ damage]]
- Sure Shot™ [Extended/ Reach/ Continuous Spray] Wand [with extended reach/ with continuous spray]
- Target[s] hard to reach [weeds/ places]
- Targets the weed under the shield
- [Use in and around] [Ideal for targeting weeds in] [fences/ driveways/ sidewalks/ patios/ and/ hard to reach places]
- Use without [the/ protective] [cone/ dome/ guard/ shield] on [patios/ walkways/ driveways/ and/ gravel/ areas]
- [Wand/ Insert Applicator Name] extends [to the top of the weeds for direct application] [2 feet] [letting you more precisely [pinpoint/ focus on] [the weeds you want to kill]
- [Wand/ Insert Applicator Name] [extends 2 feet] [to] Reduce[s] [back] bending [and the] [continuous spray wand helps reduces hand fatigue] [putting more distance between you and the spray]
- [Wand/ Insert Applicator Name] [provides the best way to] Focus the spray on the leaves [to kill to the root]
- [Wand/ Insert Applicator Name] [provides] precision control to [maximize every spray/ get the most [effect] from every spray]

APPENDIX 3: Packaging Related Instructions

QUICK CONNECT SPRAYER [Insert Graphics]

1. Remove sprayer. Pull cord/tubing **ALL THE WAY OUT**.
2. Insert [Insert Color] plug into [spout/ knob/ opening] on cap [until it clicks].
3. Flip up spout. *Alternative Text:* [Flip up [Insert Color] spout until fully upright/ [Turn/ Twist] [spout/ knob] to ON/ Pull spout up.] [Open/ Adjust] nozzle [at end of sprayer] to the desired spray setting [(spray or stream)].

PUMP 'N GO® 2 SPRAYER [Insert Graphics]

Instructions for Printing on the Wand and Handle:

Wand: STORAGE POSITION Push button and pull nozzle end. Extend to spray position. [Insert Arrow Graphic]
SPRAY POSITION

Handle: [Insert Arrow Graphic] RELEASE PRESSURE AFTER USE Push handle to cap & turn. RETIGHTEN.

1. CUT [Insert Graphics]

Carefully cut the [Insert #/ two] [Insert Color/ white] zip ties securing the hose and pump handle with scissors. Use caution not to cut the [Insert Color/ white] hose.

2. CONNECT [Insert Graphics]

Unwind hose. Firmly push the connector at the end of the hose onto the spout on the pump, until it locks into place.

3. EXTEND WAND [Insert Graphics]

Lift sprayer wand off bottle. Push [Insert Color/ yellow] button while pulling out on the wand nozzle tip. Fully extend wand until [Insert Color/ yellow] button snaps into SPRAY POSITION. **NOTE:** [Insert Color/ white] trigger will not function until wand is fully extended and [Insert Color/ yellow] button is visible in the SPRAY POSITION.

4. PUMP [Insert Graphics]

Make sure handle is screwed on **tightly** or the bottle will not pressurize. Pump container [Insert Number of Pumps to Prime X-X] times to pressurize bottle. A full bottle requires fewer pumps than an empty bottle. Pumping to the higher range will provide longer spray duration. After pumping, push pump down and turn handle clockwise to lock into carrying position. **NOTE:** This bottle is designed to expand under pressure and cannot be over-pressurized.

5. SPRAY [Insert Graphics]

Aim wand. Spray by pushing down [Insert Color/ white] trigger with thumb. Adjust spray pattern by rotating [Insert Color/ white] nozzle tip up to one-half rotation. Spray weeds [and grasses] until **thoroughly wet**.

6. STORE [Insert Graphics]

When finished spraying, push the [Insert Color/ yellow] button and [retract/ push] the wand until the [Insert Color/ yellow] button snaps back into the original STORAGE POSITION. Place wand back onto [the top of] the bottle [in the integrated holster] with nozzle [facing down/ tip extended through the eyelet opening].

7. DEPRESSURIZE [Insert Graphics]

Push pump handle all the way down and turn pump handle and cap counter-clockwise to relieve pressure, then retighten to store.

REFILL CONTAINER [Insert Graphics]

How to attach [Insert Applicator Name/ wand] to [Insert Brand Name for 71995-51] [Refill] [Bottle/ Container]:
Removing [Insert Applicator Name] from original empty [bottle/ container]:

1. Remove the [Insert Applicator Name/ wand] by pulling the [Insert Color] plug from the [Insert Color] [spout/ opening/ knob] on cap.
2. At the bottom of the side [clip/ carrier/ holder] press the middle tab up and slide the [clip/ carrier/ holder] upwards to remove it from the empty [bottle/ container].

Adding [Insert Applicator Name] to [Insert Brand name for 71995-51] [Refill] [bottle]:

3. Slide the side [clip/ carrier/ holder] downward on the knob located [on the] [right-hand] side of the refill [bottle/ container].
4. [Insert [Insert Color] plug at end of hose into [Insert Color] [spout/ knob/ opening] on cap [until it clicks].]

BATTERY OPERATED SPRAYER WITH WAND [Insert Graphics]

Wand Safety Sticker or Printed on the Handle: Always lock after use *Alternative Text:* [Always lock sprayer when opening and closing] [Insert Icons]

[Insert Illustration or Photo]

1. **Remove** [Insert Graphics- Unsnap holder/ Twist left/ Pull]

- Remove [wand/ Insert Applicator Name] [from] [side/ carrier/ holder/ clip/ bottle].
- Remove protective strip from battery compartment to activate batteries.
- [Pull connector by slightly twisting from [side/ carrier/ holder/ clip/ bottle] and unwrap hose completely.]

2. **Connect** [Insert Graphics]

- Insert [Insert Color] plug at end of hose into [Insert Color] [spout/ knob/ opening] on cap [until it clicks]. Flip up spout. *Alternative Text:* [Flip up [Insert Color] spout until fully upright/ [Turn/ Twist] [spout/ knob] to ON/ Pull spout up.] [Spout must remain up while spraying.]

3. **Extend** [Insert Graphics]

- Flip open [wand/ Insert Applicator Name] until it clicks and locks into position.

4. **[Twist Nozzle and] Spray** [Insert Graphics]

- Slide trigger lock on [wand/ Insert Applicator Name] handle to the unlocked position.
- Twist nozzle [at end of sprayer] to desired spray pattern.
- Point [Insert Applicator Name] nozzle away from body and hold [Insert Color] trigger for continuous spray.

Important Use Information: Do not submerge in water. When storing sprayer for long periods, remove batteries.

BATTERY OPERATED SPRAYER WITH EXTENDABLE WAND [Insert Graphics]

Wand Safety Sticker or Printed on the Handle: Always lock after use *Alternative Text:* [Always lock sprayer when opening and closing] [Insert Icons]

[Insert Illustration or Photo]

1. **Remove** [Insert Graphics- Unsnap holder/ Twist left/ Pull]

- Remove [wand/ Insert Applicator Name] [from] [side/ carrier/ holder/ clip/ bottle].
- Remove protective strip from battery compartment to activate batteries.
- [Pull connector by slightly twisting from [side/ carrier/ holder/ clip/ bottle] and unwrap hose completely.]

2. **Connect** [Insert Graphics]

- Insert [Insert Color] plug at end of hose into [Insert Color] [spout/ knob/ opening] on cap [until it clicks]. Flip up spout. *Alternative Text:* [Flip up [Insert Color] spout until fully upright/ [Turn/ Twist] [spout/ knob] to ON/ Pull spout up.] [Spout must remain up while spraying.]
- [Remove [protective] [cone/ dome/ guard/ shield] [from side clip/ from bottle] and attach over nozzle [for targeted application].

3. **Extend** [Insert Graphics]

- Flip open [wand/ Insert Applicator Name] until it clicks and locks into position.
- [Extend [wand/ fully]].

4. **[Twist Nozzle and] Spray** [Insert Graphics]

- Slide trigger lock on [wand/ Insert Applicator Name] handle to the unlocked position.
- Twist nozzle [at end of sprayer] to desired spray pattern.
- [Place the [cone/ dome/ guard/ shield] [on the ground] over weeds or grasses you want to kill.] [Use the [cone/ dome/ guard/ shield] to cover the weeds or grasses you want to kill.]
- Point [Insert Applicator Name] nozzle away from body and hold [Insert Color] trigger for continuous spray.
- [[Cone/ Dome/ Guard/ Shield] can be removed when applying product to [areas such as] [driveways/ walkways/ patios/ and/ gravel].

Important Use Information: Do not submerge in water. When storing sprayer for long periods, remove batteries.

BATTERY REPLACEMENT SECTION- BATTERY OPERATED SPRAYER WITH WANDS ONLY

[Insert Graphics]

To replace batteries: Open battery compartment at bottom of [wand/ Insert Applicator Name] with a small screwdriver [Insert Illustration]. Remove used batteries and replace with [Insert #/ four] new [AA/ alkaline] batteries [in correct position as marked inside battery compartment] [or per illustration].

Securely close battery compartment door and screw closed firmly. Always use a complete set of the same type when replacing batteries. Best performance is achieved with alkaline batteries. Never mix alkaline, carbon-zinc or rechargeable batteries. Dispose of used batteries according to manufacturer's instructions or in household trash.

Optional Section for Battery Operated Sprayer Only:

IMPORTANT SPRAYER INFORMATION

- Read and follow all directions before use.
- [Insert Applicator Name] is to be used only with Roundup brand products with a quick-connect cap. [Insert Applicator Name] may not be compatible with other products.
- Do not drop or throw sprayer.
- Do not [submerge/ immerse] sprayer in water. Never place sprayer in dishwasher.
- Do not use soap or other cleaning agents to clean sprayer. If necessary, clean outer sprayer surface only with damp towel.
- Insert batteries in their correct (+/-) position. Remove batteries for winter storage or when storing product for long periods of time.
- Always use a complete set of new alkaline batteries. Never mix alkaline, carbon-zinc, or rechargeable batteries.
- Always follow the manufacturer's instructions for battery disposal and use.
- Purge [Insert Applicator Name] of liquid for winter storage or place [wand/ Insert Applicator Name] in a heated storage area.

Optional Section:

TROUBLESHOOTING SECTION FOR BATTERY OPERATED SPRAYER

[Troubleshooting Section for [Battery Powered/ Comfort Wand/ One-Touch Wand/ Extendable Wand/ Sure Shot Wand/ Insert Applicator Name] Directions]

Troubleshooting Tips:

Problem: Sprayer does not [spray/ function].

Possible Cause: Batteries not installed properly.

Solution: See instructions for correct battery placement.

Problem: Sprayer makes a straining noise. [Sprayer runs but no product comes out].

Possible Cause: Nozzle is turned Off.

Solution: Twist nozzle to desired spray pattern.

Possible Cause: [Insert Color] plug at end of hose is not [flipped up/ open].

Solution: Insert [Insert Color] plug at end of hose into [Insert Color] [spout/ knob/ opening] on cap [until it clicks] and [flip up spout/ flip up [Insert Color] spout until fully upright/ [turn/ twist] [spout/ knob] to ON/ pull spout up.]

Possible Cause: Sprayer is not primed.

Solution: Press and hold button on sprayer for about [10/ 15/ 20/ 30] seconds to prime the sprayer.

Problem: Spray pattern is weak [or uneven]. [Product flow is uneven or dribbles out of nozzle].

Possible Cause: Weak batteries.

Solution: Install a fresh set of alkaline batteries.

Possible Cause: [Insert Color] plug at end of hose is not [in the fully upright position/ in the ON position].

Solution: Insert [Insert Color] plug at end of hose into [Insert Color] [spout/ knob/ opening] on cap [until it clicks]. [Attach coupler to the cap] and [flip up spout/ flip up spout/ flip up [Insert Color] spout until fully upright/ [turn/ twist] [spout/ knob] to ON/ pull spout up.]

Possible Cause: Sprayer nozzle not fully open.

Solution: [Turn/ Twist] nozzle to desired spray pattern.

Exhibit 22



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

AUTHENTICATION

I, Delores Barber, attest that I am the Director of the Information Technology and Resources Management Division (ITRMD) of the United States Environmental Protection Agency (EPA or Agency) and that the attached documents are true, correct, and compared copies of the file copies in my legal custody, consisting of:

Document Dated: Friday, April 11, 1997

Federal Register, Glyphosate; Pesticide Tolerances Final Rule (15 pages)

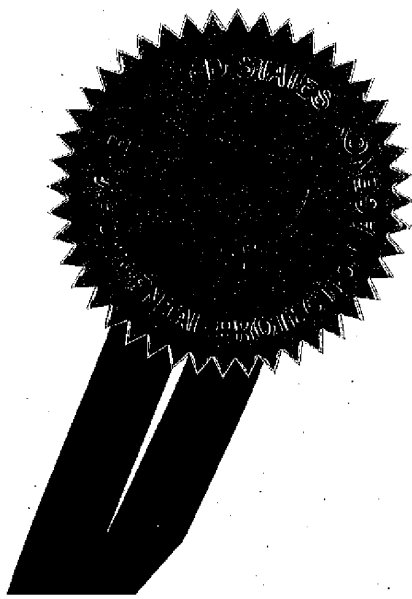
Subscribed under the penalty of perjury on this 7th day of June, 2018.

Delores Barber

Delores Barber, Director
Information Technology and Resources Management Division (ITRMD)

CERTIFICATION OF TRUE COPY

I, Wendy Blake, certify that I am the Associate General Counsel, General Law Office, Office of General Counsel, of the United States Environmental Protection Agency; that I am the designee of the General Counsel for the purpose of executing certifications under 40 C.F.R. sec. 2.406; that I have duties in Washington, District of Columbia; and that the official whose signature appears above has legal custody pursuant to 40 C.F.R. sec. 2.406 of the original documents, copies of which are attached, as witnessed by my signature and the official seal of the United States Environmental Protection Agency.



Wendy L. Blake

Wendy L. Blake
Associate General Counsel
General Law Office
Office of General Counsel

Date: 6/11/18

[Federal Register Volume 62, Number 70 (Friday, April 11, 1997)]
[Rules and Regulations]
[Pages 17723-17730]
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]
[FR Doc No: 97-9231]

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 180, 185, and 186

[OPP-300469; FRL-5598-6]

Glyphosate; Pesticide Tolerances

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This rule establishes permanent tolerances for residues of the herbicide glyphosate [N-(phosphonomethyl)glycine] in or on the raw agricultural commodities (RACs) corn, field, grain; corn, field, stover; corn, field, forage; aspirated grain fractions; sorghum, grain; sorghum, grain, stover; and oats. The residues from the treatment of field corn include residues in or on field corn varieties which have been genetically modified to be tolerant of glyphosate. Monsanto Company submitted petitions to EPA under the Federal Food, Drug, and Cosmetic Act (FFDCA) as amended by the Food Quality Protection Act of 1996 (Pub L. 104-179) requesting the tolerances.
EFFECTIVE DATES: These regulations become effective April 11, 1997. Written objections must be submitted by June 10, 1997.

ADDRESSES: Written objection and hearing requests, identified by the docket control number, [OPP-300469; PP 8F3672, 8F3673, 5F4555, 6E4645], may be submitted to: Hearing Clerk (1900), Environmental Protection Agency, Rm. M3708, 401 M St., SW., Washington, DC 20460. Fees accompanying objections shall be labeled "Tolerance Petition Fees" and forwarded to: EPA Headquarters Accounting Operations Branch, OPP (Tolerance Fees), P.O. Box 360277M, Pittsburgh, PA 15251. A copy of any objections and hearing request filed with the Hearing Clerk should be identified by the docket control number and submitted to: Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. In person, bring a copy of objections and hearing requests to: Rm. 1132, CM#2, 1921 Jefferson Davis Highway., Arlington, VA 22202.

A copy of objections and hearing requests filed with the Hearing Clerk may also be submitted electronically by sending electronic mail (e-mail) to: oppdocket@epamail.epa.gov. Copies of objections and hearing requests must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. Copies of objections and hearing requests will also be accepted on disks in WordPerfect in 5.1 file format or ASCII file format. All copies of objections and hearing requests in electronic form must be identified by the docket number [OPP-300469; PP 8F3672, 8F3673, 5F4555, 6E4645]. No Confidential Business Information (CBI) should be submitted through e-mail.

Electronic copies of objections and hearing requests on this rule may be filed online at many Federal Depository Libraries. Additional information on electronic submission can be found in Unit XIII. of this document.

FOR FURTHER INFORMATION CONTACT: By mail, Philip V. Errico, Product Manager, Registration Division (H7505C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. Office location, telephone number and e-mail address: Rm. 241, CM #2, 1921 Jefferson Davis Highway., Arlington, VA, (703)-305-6027; e-mail: errico.philip@epamail.epa.gov.

SUPPLEMENTARY INFORMATION: In the Federal Register of December 24, 1996 (61 FR 67804)(FRL-5576-6), EPA issued a Notice of Filing amending petitions PP 8F3672, 8F3673, 5F4555, 6E4645 to bring the petitions into conformity with the Food Quality Protection Act (FQPA of 1996). The notice contained a summary of the petitions prepared by the petitioner and the summary contained conclusions and arguments to support its conclusion that the petitions complied with FPQA. In that notice Monsanto Company, 700 14th Street, NW., Suite 1100, Washington, DC 20005 proposed amending 40 CFR 180.364 by establishing a regulation to permit residues of the herbicide glyphosate (N-(phosphonomethyl)glycine) resulting from the application of the isopropylamine salt and/or the monoammonium salt of glyphosate in or on the raw agricultural commodities (RACs) field corn grain at 1.0 ppm; field corn forage at 1.0 ppm; field corn fodder at 100 ppm; aspirated grain fractions at 200 ppm; grain sorghum at 15 ppm; grain sorghum fodder at 40 ppm; and oats at 20 ppm. The notice stated that PP 5F4555 specifically related to field corn which had been genetically modified to be tolerant to glyphosate.

The Agency received one comment opposing the tolerances. The commentor's objection was based on concerns of (1) Enhanced exposure of the public to glyphosate and other ingredients of the Roundup formulations, (2) greater use of Roundup/glyphosate which will result in adverse effects to the environment and human health, and (3) exposure of the public to Roundup from consumption of the corn or the animal product from animals fed corn. EPA's response to this comment is provided below.

The Agency determined that the terminology for field corn grain, field corn, forage; field corn, fodder; aspirated grain fractions; grain sorghum, and grain sorghum, fodder; should be corrected to read corn, field, grain; corn, field, stover; corn, field, forage; aspirated grain fractions; sorghum, grain; and sorghum, grain, stover; The subject regulation is therefore amended accordingly.

The data submitted in the petitions and other relevant material have been evaluated. The glyphosate toxicological data listed below were considered in support of these tolerances.

I. Toxicological Profile

1. Several acute toxicology studies placing technical-grade glyphosate in Toxicity Category III and Toxicity Category IV. Technical glyphosate is not a dermal sensitizer.

2. A 1-year feeding study with dogs fed dosage levels of 0, 20, 100, and 500 milligrams/kilogram/day (mg/kg/day) with a no-observable-effect level (NOEL) of 500 mg/kg/day.

3. A 2-year carcinogenicity study in mice fed dosage levels of 0, 150, 750, and 4,500 mg/kg/day with no carcinogenic effect at the highest dose tested (HDT) of 4,500 mg/kg/day.

4. A chronic feeding/carcinogenicity study in male and female rats fed dosage levels of 0, 3, 10, and 31 mg/kg/day (males) and 0, 3, 11, or 34 mg/kg/day (females) with no carcinogenic effects observed under the conditions of the study at dose levels up to and including 31 mg/kg/day HDT (males) and 34 mg/kg/day HDT (females) and a systemic NOEL of 31 mg/kg/day HDT (males) and 34 mg/kg/day HDT (females). Because a

maximum tolerated dose (MTD) was not reached, this study was classified as supplemental for carcinogenicity.

5. A chronic feeding/carcinogenicity study in male and female rats fed dosage levels of 0, 89, 362, and 940 mg/kg/day (males) and 1, 113, 457, and 1,183 mg/kg/day (females) with no carcinogenic effects noted under the conditions of the study at dose levels up to and including 940/1,183 mg/kg/day (males/females) HDT and a systemic NOEL of 362 mg/kg/day (males) based on an increased incidence of cataracts and lens abnormalities, decreased urinary pH, increased liver weight and increased liver weight/brain ratio (relative liver

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weight) at 940 mg/kg/day (males) HDT and 457 mg/kg/day (females) based on decreased body weight gain 1,183 mg/kg/day (females) HDT.

6. A developmental toxicity study in rats given doses of 0, 300, 1,000, and 3,500 mg/kg/day with a developmental NOEL of 1,000 mg/kg/day based on an increase in number of litters and fetuses with unossified sternebrae, and decrease in fetal body weight at 3,500 mg/kg/day, and a maternal NOEL of 1,000 mg/kg/day based on decrease in body weight gain, diarrhea, soft stools, breathing rattles, inactivity, red matter in the region of nose, mouth, forelimbs, or dorsal head, and deaths at 3,500 mg/kg/day HDT.

7. A developmental toxicity study in rabbits given doses of 0, 75, 175, and 350 mg/kg/day with a developmental NOEL of 175 mg/kg/day (insufficient litters were available at 350 mg/kg/day to assess developmental toxicity); a maternal NOEL of 175 mg/kg/day based on increased incidence of soft stool, diarrhea, nasal discharge, and deaths at 350 mg/kg/day HDT.

8. A multigeneration reproduction study with rats fed dosage levels of 0, 3, 10, and 30 mg/kg/day with the parental no-observed-effect level/lowest observed effect level (NOEL/LOEL) 30 mg/kg/day HDT. The only effect observed was an increased incidence of focal tubular dilation of the kidney (both unilateral and bilateral combined) in the high-dose male F3b pups. Since the focal tubular dilation of the kidneys was not observed at the 1,500 mg/kg/day level HDT in the rat reproduction study discussed below, but was observed at the 30 mg/kg/day level HDT in the three-generation rat reproduction study the latter was a spurious rather than glyphosate-related effect. Therefore, the parental and reproductive (pup) NOELs are 30 mg/kg/day.

9. A two generation reproduction study with rats fed dosage levels of 0, 100, 500, and 1,500 mg/kg/day with a systemic NOEL of 500 mg/kg/day based on soft stools in F0 and F1 males and females at 1,500 mg/kg/day HDT and a reproductive NOEL 1,500 mg/kg/day HDT.

10. Mutagenicity data included chromosomal aberration in vitro (no aberrations in Chinese hamster ovary cells were caused with and without S9 activation); DNA repair in rat hepatocyte; in vivo bone marrow cytogenetic test in rats; rec-assay with *B. subtilis*; reverse mutation test with *S. typhimurium*; Ames test with *S. typhimurium*; and dominant-lethal mutagenicity test in mice (all negative).

II. Dose Assessment Response

1. Reference Dose (RfD). The RfD represents the level at or below which daily aggregate dietary exposure over a lifetime will not pose appreciable risks to human health. The RfD is determined by using the toxicological end point or the NOEL for the most sensitive mammalian toxicological study. To assure the adequacy of the RfD, the Agency uses an uncertainly factor in deriving it. The factor is usually 100, based on the assumption that certain segments of the human population could be as much as 100 times more sensitive than the species represented by the toxicology. The Agency has determined a RfD of 2.0 mg/kg/day based on the maternal toxicity NOEL of 175 mg/kg/day from the developmental study with rabbits. The LOEL of 350 mg/kg/day HDT was based on treatment related findings of diarrhea, nasal, discharge, and death

(62.5% of the does died by gestation day 21). Developmental toxicity was not observed at any dose tested.

2. Carcinogenicity classification. The carcinogenic potential of glyphosate was first considered by a panel, then called the Toxicology Branch AD Hoc Committee, in 1985. The Committee, in a consensus review dated March 4, 1985, classified glyphosate as a Group C carcinogen based on an increased incidence of renal tumors in male mice. The Committee also concluded that dose levels tested in the 26-month rat study were not adequate for assessment of glyphosate's carcinogenic potential in this species. These findings, along with additional information, including a reexamination of the kidney slides from the long-term mouse study, were referred to the FIFRA Scientific Advisory Panel (SAP). In its report dated February 24, 1986, SAP classified glyphosate as a Group D Carcinogen (inadequate animal evidence of carcinogenic potential). SAP concluded that, after adjusting for the greater survival in the high-dose mice compared to concurrent controls, that no statistically significant pairwise differences existed, although the trend was significant.

The SAP determined that the carcinogenic potential of glyphosate could not be determined from existing data and proposed that the rat and/or mouse studies be repeated in order to classify these equivocal findings. On reexamination of all information, the Agency classified glyphosate as a Group D Carcinogen and requested that the rat study be repeated and that a decision on the need for a repeat mouse study would be made upon completion of review of the rat study.

Upon receipt and review of the second rat chronic feeding/carcinogenicity study, all toxicological findings for glyphosate were referred to the Health Effects Division Carcinogenicity Peer Review Committee on June 26, 1991, for discussion and evaluation of the weight of evidence on glyphosate with particular emphasis on its carcinogenic potential. The Peer Review Committee classified glyphosate as a Group E (evidence of noncarcinogenicity for humans), based upon lack of convincing carcinogenicity evidence in adequate studies in two animal species. This classification is based on the following findings: (1) None of the types of tumors observed in the studies (pancreatic islet cell adenomas in male rat, thyroid c-cell adenomas and/or carcinomas in male and female rats, hepatocellular adenomas and carcinomas in male rats, and renal tubular neoplasms in male mice) were determined to be compound related; (2) glyphosate was tested up to the limit dose on the rat and up to levels higher than the limit dose in mice; and (3) there is no evidence of genotoxicity for glyphosate.

III. Non-Dietary (Residential and Other Non-Occupational) Exposure Assessment

Glyphosate is registered for use on non-food sites such as around ornamental, shade trees, shrubs, walks, driveways, flowerbeds, home lawns, farmsteads including building foundations, along and in fences, in dry ditches and canals, along ditchbanks, farm roads, shelterbelts, forestry, Christmas trees, and industrial sites and other noncrop or industrial areas such as airports, lumber yards, manufacturing sites, utility substations, parking areas, petroleum tank farms, and pumping station.

Margins of Exposure (MOE's) are determined for non-dietary exposure based on toxicological endpoints and measured or estimated exposures. Since glyphosate is a group E chemical (evidence of non-carcinogenicity for humans), the 21 day dermal study lacked any observable effects at the limit dose, and no adverse effects were observed in developmental toxicity studies in rats up to 1,000 mg/kg/day and rabbits up to 175 mg/kg/day, no toxicological endpoints are applicable. Because available data indicated no evidence of significant toxicity via the dermal or inhalations routes, MOE's were not calculated and risk assessments are not required for non-occupational (residential uses).

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Some glyphosate end-use products (non ``homeowner'' uses only) are in Toxicity Categories I and II for dermal and eye irritation and have been associated with illness or injuries related to skin or eye irritation. Under the protective clothing requirements of the Worker Protection Standards (WPS), handlers of these products are expected to be adequately protected.

IV. Dietary Exposure Assessment

The use of a pesticide may result directly or indirectly, in residues in food. Primary residues or indirect/ inadvertent residues in the agricultural commodities harvested from the crop cultured with the aid of pesticide are determined by chemical analysis. To account for the diversity of growing conditions, culture practices, soil types, climatic conditions, crop varieties and method of use of the pesticide, data from studies that represent the resulting commodities are collected and evaluated to determine an appropriate level of the residue that would not be exceeded if the pesticide is used as represented in the studies. Available field trial data for glyphosate support these tolerances. However, because of the recent imposition of additional field trial data for specific geographical representation, additional field trial data are required for corn and grain sorghum. Because insufficient time has elapsed since imposition of these requirements the petitioner is being granted conditional registrations while obtaining the data. The conduct of the field trial and guidelines for determining the residues are given in EPA ``OPPTS Test Guidelines, Series 860, Residue Chemistry, August 28, 1996. See Federal Register, 61 FR 44308-44311 for availability of document.

The nature of the residue in plants and animals is adequately understood and consists of the parent, glyphosate. The Agency has decided that only glyphosate parent is to be regulated in plant and animal commodities and that the major metabolite, AMPA (aminomethylphosphonic acid) is not of toxicological concern regardless of its levels in food.

Secondary residues in animal commodities are expected from these uses. However, the established livestock tolerances are adequate to cover secondary residues which may result from feeding field corn (both conventional and genetically modified), and sorghum commodities with residues of glyphosate to animals. Since no U.S. registration has been proposed for oats, it has been concluded that oat feed items are not likely to enter channels of trades in the United States.

V. International Harmonization

Codex MRL's for the residues of glyphosate exist in maize and the straw and fodder, dry cereal grains at 0.1 and 100 ppm respectively. Mexican limits on maize exist at 0.1 ppm. Canadian limits on all other food crops exist at 0.1 ppm. MRL's of 20 ppm, 10 ppm, and 0.1 ppm on oats are established/pending for CODEX, Canada, and Mexico, respectively. Codex MRLs were established based on preplant/preemergent use of glyphosate and are identical to the existing tolerances for these crops under the same us conditions in the United States. The increased tolerances now being proposed on corn and sorghum are based on new preharvest uses of glyphosate in the United States. The import tolerance being proposed for oats is being proposed to harmonize with other international MRL's. The Agency suggests the petitioner consider providing all relevant studies to Codex once the U.S. tolerances are established in order that the Codex MRLs may be amended to accommodate the use needs of the United States.

Adequate enforcement methods are available for analysis of residues of glyphosate in or on plant commodities. These methods include GLC (Method I in Pesticides Analytical Manual (PAM) II; the limit of detection is 0.05 ppm). and HPLC with fluormetric detection. Use of the GLC method is being discouraged due to lengthiness of the procedure.

The HPLC method has undergone successful Agency validation and has been published in PAM II. A GC/MS method for glyphosate in crops has also been validated by the Agency. This method has not yet been submitted for publication in PAM II.

VI. Aggregate Exposure Assessment

1. Acute dietary. There is no concern for acute effects due to dietary exposure to glyphosate.

2. Chronic dietary. Using the Dietary Risk Evaluation System (DRES), a routine chronic exposure analysis was performed for glyphosate. The chronic analysis for glyphosate is a worst case estimate of dietary exposure with all residues at tolerance levels and 100% of the commodities assumed to be treated with glyphosate.

3. Drinking water. In examining aggregate exposure, FQPA directs EPA to consider available information concerning exposures from the pesticide residue in food and all other non-occupational exposures. The primary non-food sources of exposure the Agency looks at include drinking water (whether from groundwater or surface water), and exposure through pesticide use in gardens, lawns, or buildings (residential and other indoor uses).

The lifetime health advisory and maximum contaminant level (MCL), for glyphosate are the same and given as 700 parts per billion in the U.S. EPA Office of Drinking Water's "Drinking Water Health Advisory; Pesticides." Environmental Fate data for glyphosate indicate little potential for the chemical to migrate to ground water, but some potential for residues to migrate to surface waters. Glyphosate is not highly mobile and not persistent in a soil or water environment. Because the Agency lacks sufficient water-related exposure data to complete a comprehensive drinking water risk assessment for many pesticides, EPA has commenced and nearly completed a process to identify a reasonable yet conservative bounding figure for the potential contribution of water related exposures to the aggregate risk posed by a pesticide. In developing the bounding figure, EPA estimated residue levels in water for a number of specific pesticides using various data sources. The Agency then applied the estimated residue levels, in conjunction with appropriate toxicological endpoints (RfD's or acute dietary NOEL's) and assumptions about body weight and consumption, to calculate, for each pesticide, the increment of aggregate risk contributed by consumption of contaminated water. While EPA has not yet pinpointed the appropriate bounding figure for consumption of contaminated water, the ranges the Agency is continuing to examine are all below the level that would cause glyphosate to exceed the RfD if the tolerances being considered in this document were granted. The Agency has therefore concluded that the potential exposures associated with glyphosate in water, even the higher levels the Agency is considering as a conservative upper bound, would not prevent the Agency from determining that there is a reasonable certainty of no harm if the tolerance is granted.

4. Non occupational (residential) and non-dietary. Glyphosate is registered for residential uses. As part of the hazard assessment process, the Agency reviews the available toxicological database to determine the endpoints of concern. For glyphosate, the Agency does not have a concern for acute, short-term, or intermediate occupational or residential risk since the available data do not indicate any evidence of significant toxicity by the dermal or inhalation routes, or from a 1 day or single event exposure by the oral route. Therefore, an

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acute, a short-term, or intermediate-term occupational or residential risk assessment was not required.

As part of the hazard assessment process it was determined that a chronic residential assessment was not necessary. The exposures which would result from the use of glyphosate were determined to be of an

intermittent nature. The frequency and duration of these exposures do not exhibit a chronic exposure pattern. The exposures do not occur often enough to be considered a chronic exposure i.e., a continuous exposure that occurs for at least several months. Therefore, residential exposures were not aggregated with dietary exposures in estimating chronic risk.

6. Cumulative exposure to substances with common mechanism of toxicity. Section 408 (b)(2)(D)(v) requires that, when considering whether to establish, modify, or revoke a tolerance, the Agency consider ``available information'' concerning the cumulative effects of a particular pesticide's residues and ``other substances that have a common mechanism of toxicity.'' The Agency believes that ``available information'' in this context might include not only toxicity, chemistry, and exposure data, but also scientific policies and methodologies for understanding common mechanisms of toxicity and conducting cumulative risk assessments. For most pesticides, although the Agency has some information in its files that may turn out to be helpful in eventually determining whether a pesticide shares a common mechanism of toxicity with any other substances, EPA does not at this time have the methodologies to resolve the complex scientific issues concerning common mechanism of toxicity in a meaningful way. EPA has begun a pilot process to study this issue further through examination of particular classes of pesticides. The Agency hopes that the results of this pilot process will increase the Agency's scientific understanding of this question such that EPA will be able to develop and apply scientific principles for better determining which chemicals have a common mechanism of toxicity and evaluating the cumulative effects of such chemicals. The Agency anticipates, however, that even as its understanding of the science of common mechanisms increases, decisions on specific classes of chemicals will be heavily dependent on chemical specific data, much of which may not be presently available.

Although at present the Agency does not know how to apply the information in its files concerning common mechanism issues to most risk assessments, there are pesticides as to which the common mechanisms issues can be resolved. These pesticides include pesticides that are toxicologically and structurally dissimilar to existing chemical substances (in which the Agency can conclude that it is unlikely that a pesticide shares a common mechanism of activity with other substances) and pesticides that produce a common toxic metabolite (in which case common mechanism of activity will be assumed).

EPA does not have, at this time, available data to determine whether glyphosate has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. Unlike other pesticides for which EPA has followed a cumulative risk approach based on common mechanism of toxicity, glyphosate does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore EPA has not assumed that glyphosate has a common mechanism of toxicity with other substances. A condition of the registrations associated with these tolerances will be that the registrant will provide common mechanism data in a timely manner when and if the Agency asks for it. After EPA develops methodologies for more fully applying common mechanism of toxicity issues to risk assessments, the Agency will develop a process (either as a part of the periodic review of pesticides or otherwise) to reexamine those tolerance decisions made earlier.

VII. Determination of Safety for the U.S. Population and Nonnursing Infants

Using the Dietary Risks Evaluation System (DRES) a chronic analysis was based on 100% of the crop treated and all residues at tolerance levels. Based on the dietary risk assessment the proposed uses utilize 0.115% of the RfD for U.S. population; 0.189% of the RfD for non-nursing infants under 1 year old; 0.84 of the RfD for nursing infants

under 1 year old; 0.866% of the RfD for children 1 to 6 years old; and 0.443% of the RfD for children 7 to 12 years old. Total aggregate exposure from glyphosate residues in food, taking into account existing and proposed uses, uses 1% of the RfD for the overall U.S. population and nursing infants: 3% of the RfD for nonnursing infants under 1 year old and children 1 to 6 years old; 3%; and 2% of the RfD for children 7 to 12 years old. An additional risk assessment for residential uses was not required because of no evidence of significant toxicology via dermal or inhalation routes. Even though the Agency has not pinpointed the appropriate bounding figure for consumption of contaminated water, the ranges the Agency is continuing to examine are all below the level that would cause glyphosate to exceed the RfD. EPA concluded that there is reasonable certainty that no harm will occur from aggregate exposure to glyphosate.

VIII. Determination of Safety for Infants and Children

FFCDA section 408 provides that EPA shall apply an additional tenfold margin of exposure (safety) for infants and children in the case of threshold effects to account for pre- and post-natal toxicity and the completeness of the database unless EPA determines that a different margin of exposure (safety) will be safe for infants and children. Margins or exposure (safety) are often referred to as uncertainty (safety) factors. EPA believes that reliable data support using the standard margin of exposure (usually 100x for combined inter- and intra-species variability) and not the additional tenfold margin of exposure when EPA has a complete data base under existing guidelines and when the severity of the effect in infants and children or the potency or unusual toxic properties of a compound do not raise concerns regarding the adequacy of the standard margin of exposure.

Risk to infants and children was determined by the use of two developmental toxicity studies in rats and rabbits and the two-generation reproduction study in rats discussed below. The developmental toxicity studies evaluate the potential for adverse effects on the developing organism resulting from exposure during prenatal development. The reproduction study provides information relating to effects from exposure to the chemical on the reproductive capability of both (mating) parents and on systemic toxicity.

The toxicological database for evaluating pre- and post-natal toxicity for glyphosate is considered to be complete at this time. In the rabbits, no developmental toxicity was observed at doses where significant maternal toxicity was noted (death and clinical signs at 350 mg/kg/day, highest dose tested HDT. In the rat developmental toxicity study, maternal (systemic) toxicity was noted at 3,500 mg/kg/day, HDT as diarrhea, decreased mean body weight gain, breathing rattles, inactivity, red matter around the nose and mouth, and on forelimbs and dorsal head, decreases in total implantations/dam and inviable fetuses/dam and death (24% of the group). The developmental (pup) NOEL is 1,000 mg/kg/day. The

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developmental (pup) toxicity was exhibited only in the high dose as increased numbers of litters and fetuses with unossified sternebrae, and decreased mean fetal body weights. However, these developmental effects were assumed to be due to the extreme maternal toxicity. No effects on reproductive parameters were observed.

In the rat two-generation reproduction study, parental toxicity was observed at 1,500 mg/kg/day as soft stools, decreased food consumptions and body weight gain. The developmental (pup) toxicity was also only exhibited at 1,500 mg/kg/day as decreased body weight gain of the F1a, F2a, and F2b male and female pups during the second and third weeks of lactation.

The RfD is based on the NOEL for maternal toxicity in the rabbit developmental study. No developmental effects were noted in the study.

In the rat developmental study effects were noted only at 20x higher than the NOEL used for the RfD. No pre- or post-natal effects were seen in any study absent maternal toxicity. In the rat reproduction study developmental effects were noted at 5x the NOEL used for the RfD. The Agency does not believe the effects seen in these studies are of such concern to require an additional safety factor. Accordingly, the Agency believes the RfD has an adequate margin of protection for infants and children. The percent RfD utilized by glyphosate is from 1% for nursing infants (less than 1 year old) to 3% for non-nursing infants and children 1 to 6 years old. EPA concluded that there is reasonable certainty that no harm will occur to infants and children from aggregate exposure to glyphosate.

IX. Other Considerations

Endocrine effects. No specific tests have been conducted with glyphosate to determine whether the chemical may have an effect in humans that is similar to an effect produced by a naturally occurring estrogen or other endocrine effects. However, there are no significant findings in other relative toxicity studies, i.e., teratology and multi-generation reproductive studies which would suggest that glyphosate produces these kinds of effects.

X. Data Gaps

Data desirable but lacking for these tolerances include specific geographic representative grain sorghum and corn field residue trials. Because of insufficient time since the imposition of additional data requirements the Agency is requiring that this data be submitted as a condition of registration.

Based on the information cited above, the Agency has determined that the establishment of these tolerances by amending 40 CFR part 180 will be safe, therefore the tolerances are established as set forth below.

In addition to the time-limited tolerances being amended, since for purposes of establishing tolerances FQPA has eliminated all distinctions between raw and processed food, EPA is combining the tolerances that now appear in Secs. 185.3500 and 186.3500 with the tolerances in Sec. 180.364 and is eliminating Secs. 185.3500 and 186.3500.

XI. Response to Comment

The one commenter raised several concerns regarding these tolerances.

1. Increased exposure. The commenter was concerned that approval of these tolerances would lead to increased exposure to glyphosate because it would enhance Monsanto's ability to market glyphosate-tolerant corn and thus use glyphosate. The commentator argued that therefore approval of the tolerances would not protect the public health rather it would increase risk.

EPA response. Approval of these tolerances may lead to higher exposure the glyphosate residues. That is the case when ever EPA approves a new tolerance. The question before EPA in ruling on a tolerance petition is whether the tolerance meets the FFDCA's safety standard. As detailed above, EPA has concluded that these tolerances do meet the reasonable certainty of no harm standard. This standard requires consideration of exposure to glyphosate from existing uses as well as exposure from the uses covered by the tolerances in the petition before EPA.

2. Glyphosate residues in foods derived from animals. The commenter asked EPA to confirm that the major route of exposure resulting from these tolerances would be from foods derived from animals. The commenter also asked how the tolerances would effect the level of glyphosate residues in animal feeds and what percentage of glyphosate

treated corn would be consumed by humans.

EPA response. The nature of glyphosate residue in plants and animals has been explored by various studies that have been reviewed by the Agency. A separate peer review committee ``Metabolism Committee'' evaluated glyphosate plant and animal commodities and decided that the major metabolite is not of toxicological concern regardless of its level in food. Due to the use pattern of glyphosate, secondary residues in animal commodities are expected. Corn grain, forage, fodder, and aspirated grain fractions are animal feed items. Based on the proposed tolerances on aspirated grain fractions, corn stover, forage, and grain, the dietary burden of at most 78 ppm glyphosate residue in/on corn commodities, (if all corn commodities (including corn genetically altered to be tolerant to glyphosate) are fed)) will be covered by the tolerances currently established on meat, milk, eggs, and livestock commodities including the recently (April 5, 1996, 61 FR 15192)(FRL-5351-1), established tolerances on kidney of cattle, goats, hogs, horses, poultry, and sheep at 4 ppm. A chronic (long-term) dietary exposure analysis (DRES) was performed for the use of glyphosate in/on corn. The Agency used the following conservative (worst-case) assumptions: all corn (including genetically altered corn) would have the same tolerance level residues, and that 100 percent of the crop is treated. It is not believed that actual residues would reach tolerance levels, or that 100 percent of the total corn crop would be treated with glyphosate. The Agency feels that the risk to human health does not exceed a level of concern (100%) due to the percent of the RfD using the ``worst case'' assumptions. These dietary risk numbers include corn consumed directly by humans, plus meat, milk and eggs from which animals consumed corn raw agricultural commodities as feed. Published and proposed glyphosate tolerances result in the following percents of the RfD used: 1% for the overall U.S. population and nursing infants, 2% for children (7 to 12 years old), and 3% non-nursing infants less than 1 year old and children (1 to 6 years old).

3. Toxicology concerns. The commenter challenged Monsanto's assertions that glyphosate was of low toxicity. The commenter cited the fact that glyphosate ranked number 3 in California for acute illnesses in agriculture from 1984-1990. The commenter claimed that glyphosate is a skin and eye irritant, a possible carcinogen, a mutagen, and a reproductive toxicant. In support of glyphosate's carcinogenicity, the commenter claimed that one of the metabolites or breakdown products of glyphosate is formaldehyde and the commenter asserted that formaldehyde is a carcinogen, mutagen, and reproductive toxicant.

Additionally, the commenter claimed that a study showed that glyphosate decreased lung function and that studies showed that glyphosate inhibits enzymes involved in the detoxification of chemicals.

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4. Acute illnesses and skin and eye irritation--EPA response. Data indicate that technical-grade glyphosate is in Toxicity Category III and Toxicity Category IV and that technical glyphosate is not a dermal sensitizer. Some formulations of glyphosate are in Category I and II where skin and eye irritation were associated with acute illnesses. Some of these formulations are being phased out of the U.S. market. Handlers and users of remaining formulations in Category I and II are expected to be adequately protected by the protective clothing requirements of the Worker Protection Standards (WPS). Data reviewed by the Agency on current formulations place these formulations in Toxicity Category III and IV.

5. Carcinogen, mutagen and reproductive toxicity--EPA response. Data indicate that glyphosate is a group E carcinogen (evidence of noncarcinogenicity for studies in humans, causes no pre- or post-natal effects in any study absent maternal toxicity, and is not a mutagen (refer to toxicology discussion above for a detailed discussion of carcinogenicity, reproductive, developmental and mutagenicity testing)).

6. Formaldehyde--EPA response. Available rat metabolism data, residue data, and environmental data indicate that the major metabolite of glyphosate is AMPA which is further degraded by soil microbes to CO₂. The Agency has determined that AMPA is not of toxicological concern. (Glyphosate Reregistration Eligibility Decision (RED) issued by EPA September 1993). Available data do not indicate that formaldehyde is a metabolite or a degradate of glyphosate.

7. Decreased lung function--EPA response. Data reviewed by the Agency for glyphosate formulations for acute inhalation place most glyphosate formulations in Toxicity Category III and IV for acute inhalation. The Agency believes that handlers of these formulations and any formulations that may be Toxicity Category I or II are expected to be adequately protected by the protective clothing required by WPS.

8. Interference with enzymes--EPA response. The mode of action for glyphosate does involve interference with enzymes that result in the death of plants by inhibiting the biosynthesis of aromatic amino acids which along with other biochemical changes results in the death of plants. This is a common mode of action for various pesticides, but the Agency has no information that indicates that the handling or ingestion of glyphosate in small amounts result in interference with enzymes in the human body.

9. Inert Ingredients. The commenter also contended that EPA must examine the toxicity of the inert ingredients in glyphosate products in setting these tolerances.

EPA response. These tolerances establish maximum legal levels of residues of the active ingredient glyphosate that can be present in certain foods. These tolerances do not legalize any inert ingredients in glyphosate products. If a pesticide product also contains inert ingredients, those inert ingredients must have tolerances or exemptions from the requirement or their presence in food will render the food adulterated. Before approving a pesticide registration under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136 et seq., EPA checks to make sure that all needed tolerances or exemptions are in place. All inerts present in current glyphosate formulations for use on food crops either have tolerances or exemptions from tolerances. Additionally, under the FIFRA registration process, EPA evaluates the potential risks posed by inert ingredients. The Agency requires a full disclosure of inert ingredients for each Roundup formulation to determine acute toxicity such as acute eye, skin, inhalation, and dermal sensitization. Refer to previous discussions on skin, eye, and acute inhalation for discussion of formulations.

10. Persistence in soil. The commenter claimed that glyphosate persists in soils from 3 to 141 days.

EPA response. Data from background field dissipation trials from eight sites show that the median half-life (DT₅₀) for glyphosate applied at maximum use rates was 13.9 days with a range of 2.6 (Texas) to 140.6 (Iowa) days. Acceptable aerobic soil, aerobic aquatic, and anaerobic aquatic metabolism studies demonstrate that under those conditions at 25 deg.C in the laboratory, glyphosate degrades rapidly with half-lives of approximately 2, 7, and 8 days respectively. The reported half-lives from the field studies conducted in the coldest climates, i.e. Minnesota, New York, and Iowa, were the longest at 28.7 days, 127.8 days, and 140.6 days respectively indicating that glyphosate residues in the field are somewhat more persistent in cooler climates as opposed to milder ones (Georgia, California, Arizona, Ohio, and Texas. AMPA was the major degradate in all studies. AMPA has been determined to not be of toxicological concern. (Glyphosate Reregistration Eligibility Decision (RED) issued by EPA September, 1993).

11. Environmental effects. The commenter also claimed that data was lacking regarding glyphosate's toxicity to soil invertebrates, reptiles, and amphibians.

EPA response. Environmental Effects are considered under FIFRA. In examining glyphosate under FIFRA the Agency required several tests with mammals; acute tests to birds, fish, aquatic invertebrates, and bees;

subacute dietary testing on birds; avian reproduction; and chronic testing on freshwater fish and freshwater invertebrates. Data submitted to and reviewed by the Agency indicate that effects to birds, mammals, fish, and invertebrates are minimal. (Glyphosate Registration Eligibility Decision (RED) issued by EPA September, 1993).

XII. Objections and Hearing Requests

The new FFDCA section 408 (g) provides essentially the same process for persons to "object" to a tolerance regulation issued by EPA under the new section 408 (e) and (1)(6) as was provided in the old section 408 and section 409. However, the period for filing objections is 60 days rather than 30 days. EPA currently has procedural regulations which governs the submission of objections and hearing requests. These regulations will require some modification to reflect the new law. However, until those modifications can be made, EPA will continue to use those procedural regulations with appropriate adjustments to reflect the new law.

Any person adversely affected by this regulation may, by June 10, 1997, file written objections to any aspect of this regulation (including the automatic revocation provision) and may also request a hearing on those objections. Objections and hearing requests must be filed with the Hearing Clerk, at the address given below (40 CFR 178.20). A copy of the objections and/or hearing requests filed with the Hearing Clerk should be submitted to the OPP docket for this rulemaking. The objections submitted must specify the provisions of the regulation deemed objectionable and the grounds for the objections (40 CFR 178.25). Each objection must be accompanied by the fee prescribed by 40 CFR 180.33(i). If a hearing is requested, the objections must include a statement of the factual issue(s) on which the hearing is requested, the requestor's contentions on each such issue, and a summary of any evidence relied upon by the objector (40 CFR 178.27). A request for a hearing will be granted if the Administrator determines that the material submitted shows the following: There is a genuine and

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substantial issue of fact; there is a reasonable possibility that available evidence identified by the requestor would, if established, resolve one or more issues in favor of the requestor, taking into account uncontested claims or facts to the contrary; and resolution of the factual issue(s) in the manner sought by the requestor would be adequate to justify the action requested. (40 CFR 178.32). Information submitted in connection with an objection or hearing request may be claimed confidential by marking any or all of that information as "Confidential Business Information" (CBI). Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. A copy of the information that does not contain CBI must be submitted for inclusion in the public record. Information not marked confidential may be disclosed publicly by EPA without prior notice.

XIII. Public Docket

EPA has established a record for this rulemaking under docket number [OPP-300469; PP 8F3672, 8F3673, 5F4555, 6E4645] (including any comments and data submitted electronically). A public version of this record, including printed, paper versions of electronic comments, which does not include any information claimed as CBI, is available for inspection from 8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The public record is located in Room 1132 of the Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs, Environmental Protection Agency, Crystal Mall #2, 1921 Jefferson Davis Highway, Arlington, VA.

Electronic comments may be sent directly to EPA at:

opp-docket@epamail.epa.gov.

Electronic comments must be submitted as an ASCII file avoiding the use of special characters and any form of encryption.

The official record for this rulemaking, as well as the public version, as described above will be kept in paper form. Accordingly, EPA will transfer any copies of objections and hearing requests received electronically into printed, paper form as they are received and will place the paper copies in the official rulemaking record which will also include all comments submitted directly in writing. The official rulemaking record is the paper record maintained at the address in ADDRESSES at the beginning of this document.

XIV. Regulatory Assessments Requirements

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is not a "significant regulatory action" and, since this action does not impose any information collection requirements subject to approval under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq., it is not subject to review by the Office of Management and Budget. In addition, this action does not impose any enforceable duty, or contain any "unfunded mandates" as described in Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4), or require prior consultation as specified by Executive Order 12875 (58 FR 58093, October 28, 1993), or special consideration as required by Executive Order 12898 (59 FR 7629, February 16, 1994).

Because tolerances established on the basis of a petition under section 408(d) of FFDCA do not require issuance of a proposed rule, the regulatory flexibility analysis requirements of the Regulatory Flexibility Act (RFA), 5 U.S.C. 604(a), do not apply. Prior to the recent amendment of the FFDCA, EPA had treated such rulemakings as subject to the RFA; however, the amendments to the FFDCA clarify that no proposal is required for such rulemakings and hence that RFA is inapplicable. Nonetheless, the Agency has previously assessed whether establishing tolerances or exemptions from tolerance, raising tolerance levels, or expanding exemptions adversely impact small entities and concluded, as a generic matter, that there is no adverse impact. (46 FR 24950, May 4, 1981).

Pursuant to 5 U.S.C. 801 (a)(1)(A), EPA submitted a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives and the Comptroller General of the General Accounting Office prior to publication of this rule in today's Federal Register. This rule is not a major rule as defined by 5 U.S.C. 804(2).

List of Subjects

40 CFR Part 180

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pest, Reporting and recordkeeping requirements.

40 CFR Part 185

Environmental protection, Food additives, Pesticides and pests.

40 CFR Part 186

Environmental protection, Animal feeds, Pesticides and pests.

Dated: March 28, 1997.

Peter Caulkins,
Acting Director, Registration Division, Office of Pesticide Programs.

Therefore, chapter I of title 40 of the Code of Federal Regulations

is amended as follows:

PART 180--[AMENDED]

1. In part 180:

a. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 346a and 371.

b. Section 180.364 is amended as follows:

i. By adding a paragraph heading to paragraph (a), and in the table by revising the entry ``Grain crops (except wheat)'' and alphabetically adding the commodities: aspirated grain fractions; corn, field, forage; corn, field, grain; corn, field, stover; oats; sorghum, grain; and sorghum, grain, stover.

ii. In paragraph (b) by transferring the entries in the table and alphabetically adding them to the table in paragraph (a), by removing the remaining text of paragraph (b), by adding a paragraph heading and reserving paragraph (b).

iii. In paragraph (d) by transferring the entries in the table and alphabetically adding them to the table in paragraph (a), by removing the remaining text of paragraph (d).

iv. In paragraph (c) is amended by adding a paragraph heading, ``Indirect and inadvertent residues'', and redesignating the amended paragraph (c) as new paragraph (d), and by adding a heading and reserving new paragraph (c).

Sec. 180.364 Glyphosate, tolerances for residues.

(a) General. * * *

Commodity	Parts Per Million (ppm)
Aspirated grain fractions.....	200.0
Corn, field, forage.....	1.0
Corn, field, grain.....	1.0
Corn, field, stover.....	100.0
Grain crops (except wheat, corn, oats, and grain sorghum)..	0.010
Oats, grain.....	20.0
Sorghum, grain.....	15.0
Sorghum, grain, stover.....	40.0

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(b) Section 18 emergency exemptions. [Reserved]

(c) Tolerances with regional registrations. [Reserved]

(d) Indirect or inadvertent residues. * * *

PART 185--[AMENDED]

2. In part 185:

- a. The authority citation for part 185 continues to read.
Authority: 21 U.S.C. 346a and 348.

Sec. 185.3500 [Removed]

b. In Sec. 185.3500 by transferring the entries in the tables to paragraphs (a)(1), (2), and (3), and alphabetically adding them to the table in paragraph (a) of Sec. 180.364, and by removing the remainder of Sec. 185.3500.

PART 186--[AMENDED]

3. In part 186:
 - a. The authority citation for part 185 continues to read.
Authority: 21 U.S.C. 342, 348 and 701.

Sec. 186.3500 [Removed]

b. In Sec. 186.3500 by transferring the entries in the tables to paragraphs (a) and (b) and alphabetically adding them to the table in paragraph (a) of Sec. 180.364, and by removing the remainder of Sec. 186.3500.

[FR Doc. 97-9231 Filed 4-10-97; 8:45 am]
BILLING CODE 6560-50-F

Exhibit 23



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

AUTHENTICATION

I, Delores Barber, attest that I am the Director of the Information Technology and Resources Management Division (ITRMD) of the United States Environmental Protection Agency (EPA or Agency) and that the attached documents are true, correct, and compared copies of the file copies in my legal custody, consisting of:

Document Dated: Wednesday, November 24, 1999
Federal Register, Glyphosate; Pesticide Tolerances Final Rule (13 pages)

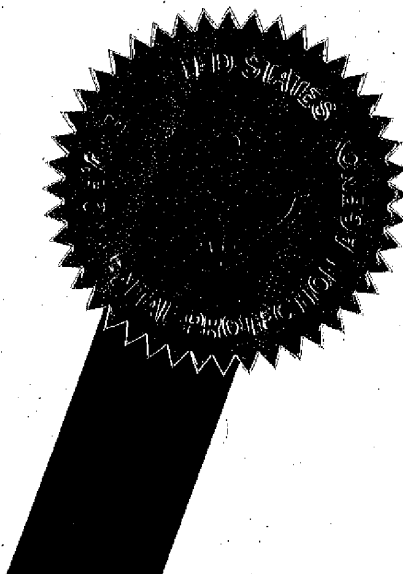
Subscribed under the penalty of perjury on this 7th day of June, 2018.

Delores Barber

Delores Barber, Director
Information Technology and Resources Management Division (ITRMD)

CERTIFICATION OF TRUE COPY

I, Wendy Blake, certify that I am the Associate General Counsel, General Law Office, Office of General Counsel, of the United States Environmental Protection Agency; that I am the designee of the General Counsel for the purpose of executing certifications under 40 C.F.R. sec. 2.406; that I have duties in Washington, District of Columbia; and that the official whose signature appears above has legal custody pursuant to 40 C.F.R. sec. 2.406 of the original documents, copies of which are attached, as witnessed by my signature and the official seal of the United States Environmental Protection Agency.



Wendy L. Blake

Wendy L. Blake
Associate General Counsel
General Law Office
Office of General Counsel

Date: 6/14/18

[Federal Register Volume 64, Number 226 (Wednesday, November 24, 1999)]

[Rules and Regulations]

[Pages 66108-66114]

From the Federal Register Online via the Government Publishing Office [www.gpo.gov]

[FR Doc No: 99-30408]

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 180

[OPP-300946; FRL-6390-5]

RIN 2070-AB78

Glyphosate; Pesticide Tolerance

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This regulation establishes tolerances for glyphosate (N-(phosphonomethyl)glycine) in or on certain raw agricultural commodities from application of glyphosate in its acid form. Entek Corporation requested this tolerance under the Federal Food, Drug, and Cosmetic Act, as amended by the Food Quality Protection Act of 1996.

DATES: This regulation is effective November 24, 1999. Objections and requests for hearings, identified by docket control number OPP-300946, must be received by EPA on or before January 24, 2000.

ADDRESSES: Written objections and hearing requests may be submitted by mail, in person, or by courier. Please follow the detailed instructions for each method as provided in Unit VI. of the ``SUPPLEMENTARY INFORMATION.'' To ensure proper receipt by EPA, your objections and hearing requests must identify docket control number OPP-300946 in the subject line on the first page of your response.

FOR FURTHER INFORMATION CONTACT: By mail: James A. Tompkins, Registration Division (7505C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. Office location, telephone number, and e-mail address: Crystal Mall #2, 1921 Jefferson Davis Hwy., Arlington, VA, (703) 305-5697, e-mail: tompkins.james@epa.gov.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does This Action Apply to Me?

You may be affected by this action if you are an agricultural producer, food manufacturer, or pesticide manufacturer. Potentially affected categories and entities may include, but are not limited to:

Categories

NAICS Codes

Examples of
potentially

affected entities

Industry.....	111	Crop production
	112	Animal production
	311	Food manufacturing
	32532	Pesticide manufacturing

This listing is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. Other types of entities not listed in the table could also be affected. The North American Industrial Classification System (NAICS) codes have been provided to assist you and others in determining whether or not this action might apply to certain entities. If you have questions regarding the applicability of this action to a particular entity, consult the person listed under ``FOR FURTHER INFORMATION CONTACT.''

B. How Can I Get Additional Information, Including Copies of This Document and Other Related Documents?

1. Electronically. You may obtain electronic copies of this document, and certain other related documents that might be available electronically, from the EPA Internet Home Page at <http://www.epa.gov/>. To access this document, on the Home Page select ``Laws and Regulations'' and then look up the entry for this document under the ``Federal Register--Environmental Documents.''. You can also go directly to the Federal Register listings at <http://www.epa.gov/fedrgstr/>.

2. In person. The Agency has established an official record for this action under docket control number OPP-300946. The official record consists of the documents specifically referenced in this action, and other information related to this action, including any information claimed as Confidential Business Information (CBI). This official record includes the documents that are physically located in the docket, as well as the documents that are referenced in those documents. The public version of the official record does not include any information claimed as CBI. The public version of the official record, which includes printed, paper versions of any electronic comments submitted during an applicable comment period is available for inspection in the Public Information and Records Integrity Branch (PIRIB), Rm. 119, Crystal Mall #2, 1921 Jefferson Davis Hwy., Arlington, VA, from 8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The PIRIB telephone number is (703) 305-5805.

II. Background and Statutory Findings

In the Federal Register of August 25, 1999 (64 FR 46382) (FRL-6093-7), EPA issued a notice pursuant to section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. 346a as amended by the Food Quality Protection Act of 1996 (FQPA) (Public Law 104-170) announcing the filing of a pesticide petition (PP 9F5095) for a tolerance by Entek Corporation, 6835 Deerpath Road, Suite E, Elkridge, MD 21075. This notice included a summary of the petition prepared by Entek, the registrant. There were no comments received in response to the notice of filing.

The petition requested that 40 CFR 180.364 be amended by revising the existing tolerance regulation for glyphosate to allow application of glyphosate (in its acid form) on raw agricultural commodities (RACs).

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Section 408(b)(2)(A)(i) of the FFDCA allows EPA to establish a tolerance (the legal limit for a pesticide chemical residue in or on a

food) only if EPA determines that the tolerance is ``safe.'' Section 408(b)(2)(A)(ii) defines ``safe'' to mean that ``there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information.'' This includes exposure through drinking water and in residential settings, but does not include occupational exposure. Section 408(b)(2)(C) requires EPA to give special consideration to exposure of infants and children to the pesticide chemical residue in establishing a tolerance and to ``ensure that there is a reasonable certainty that no harm will result to infants and children from aggregate exposure to the pesticide chemical residue....''

EPA performs a number of analyses to determine the risks from aggregate exposure to pesticide residues. For further discussion of the regulatory requirements of section 408 and a complete description of the risk assessment process, see the final rule on Bifenthrin Pesticide Tolerances (62 FR 62961, November 26, 1997) (FRL-5754-7).

III. Aggregate Risk Assessment and Determination of Safety

Consistent with section 408(b)(2)(D), EPA has reviewed the available scientific data and other relevant information in support of this action. EPA has sufficient data to assess the hazards of and to make a determination on aggregate exposure, consistent with section 408(b)(2), for tolerances for glyphosate by revising the existing tolerance regulation for glyphosate to allow application of glyphosate (in its acid form) on raw agricultural commodities (RACs). EPA's assessment of the dietary exposures and risks associated with establishing the tolerances follows.

A. Toxicological Profile

EPA has evaluated the available toxicity data and considered its validity, completeness, and reliability as well as the relationship of the results of the studies to human risk. EPA has also considered available information concerning the variability of the sensitivities of major identifiable subgroups of consumers, including infants and children. The nature of the toxic effects caused by glyphosate are discussed in this unit.

1. Several acute toxicology studies placing technical-grade glyphosate in Toxicity Category III and Toxicity Category IV. Technical glyphosate is not a dermal sensitizer.

2. A 21-day dermal toxicity study in which rabbits were exposed to glyphosate at levels of 0, 10, 1,000, or 5,000 milligrams/kilogram/day (mg/kg/day). The systemic no observed adverse effect level (NOAEL) was 1,000 mg/kg/day and the lowest observed adverse effect level (LOAEL) was 5,000 mg/kg/day based on decreased food consumption in males. Although serum lactate dehydrogenase was decreased in both sexes at the high dose, this finding was not considered to be toxicologically significant.

3. A 1-year feeding study with dogs fed dosage levels of 0, 20, 100, and 500 mg/kg/day with a NOAEL of 500 mg/kg/day.

4. A 2-year carcinogenicity study in mice fed dosage levels of 0, 150, 750, and 4,500 mg/kg/day with no carcinogenic effect at the highest dose tested (HDT) of 4,500 mg/kg/day.

5. A chronic feeding/carcinogenicity study in male and female rats fed dosage levels of 0, 3, 10, and 31 mg/kg/day (males) and 0, 3, 11, or 34 mg/kg/day (females) with no carcinogenic effects observed under the conditions of the study at dose levels up to and including 31 mg/kg/day (HDT) (males) and 34 mg/kg/day (HDT) (females) and a systemic NOAEL of 31 mg/kg/day (HDT) (males) and 34 mg/kg/day (HDT) (females). Because a maximum tolerated dose (MTD) was not reached, this study was classified as supplemental for carcinogenicity.

6. A chronic feeding/carcinogenicity study in male and female rats fed dosage levels of 0, 89, 362, and 940 mg/kg/day (males) and 1, 113,

457, and 1,183 mg/kg/day (females) with no carcinogenic effects noted under the conditions of the study at dose levels up to and including 940/1,183 mg/kg/day (males/females) (HDT) and a systemic NOAEL of 362 mg/kg/day (males) based on an increased incidence of cataracts and lens abnormalities, decreased urinary pH, increased liver weight and increased liver weight/brain ratio (relative liver weight) at 940 mg/kg/day (males) (HDT) and 457 mg/kg/day (females) based on decreased body weight gain 1,183 mg/kg/day (females) (HDT).

7. A developmental toxicity study in rats given doses of 0, 300, 1,000, and 3,500 mg/kg/day with a developmental (fetal) NOAEL of 1,000 mg/kg/day based on an increase in number of litters and fetuses with unossified sternebrae, and decrease in fetal body weight at 3,500 mg/kg/day, and a maternal NOAEL of 1,000 mg/kg/day based on decrease in body weight gain, diarrhea, soft stools, breathing rattles, inactivity, red matter in the region of nose, mouth, forelimbs, or dorsal head, and deaths at 3,500 mg/kg/day (HDT).

8. A developmental toxicity study in rabbits given doses of 0, 75, 175, and 350 mg/kg/day with a developmental NOAEL of 175 mg/kg/day (insufficient litters were available at 350 mg/kg/day to assess developmental toxicity); a maternal NOAEL of 175 mg/kg/day based on increased incidence of soft stool, diarrhea, nasal discharge, and deaths at 350 mg/kg/day (HDT).

9. A multi-generation reproduction study with rats fed dosage levels of 0, 3, 10, and 30 mg/kg/day with the parental NOAEL/LOAEL 30 mg/kg/day (HDT). The only effect observed was an increased incidence of focal tubular dilation of the kidney (both unilateral and bilateral combined) in the high-dose male F3b pups. Since the focal tubular dilation of the kidneys was not observed at the 1,500 mg/kg/day level (HDT) in the rat reproduction study discussed below, but was observed at the 30 mg/kg/day level (HDT) in the 3-generation rat reproduction study, the latter was a spurious rather than glyphosate-related effect. Therefore, the parental and reproductive (pup) NOAELs are 30 mg/kg/day.

10. A 2-generation reproduction study with rats fed dosage levels of 0, 100, 500, and 1,500 mg/kg/day with a systemic NOAEL of 500 mg/kg/day based on soft stools in F0 and F1 males and females at 1,500 mg/kg/day (HDT) and a reproductive NOAEL 1,500 mg/kg/day (HDT).

11. Mutagenicity data included chromosomal aberration in vitro (no aberrations in Chinese hamster ovary cells were caused with and without S9 activation); DNA repair in rat hepatocyte; in vivo bone marrow cytogenic test in rats; rec-assay with *B. subtilis*; reverse mutation test with *S. typhimurium*; Ames test with *S. typhimurium*; and dominant-lethal mutagenicity test in mice (all negative).

B. Toxicological Endpoints

1. Acute toxicity. No toxicological endpoint attributable to a single dose was identified in oral studies including the rat and rabbit developmental studies. There are no data requirements for acute or subacute neurotoxicity studies since there was no evidence of neurotoxicity in any of the toxicology studies at very high doses.

2. Short- and intermediate-term toxicity. No short- or intermediate-term dermal or inhalation endpoints were

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identified. In a 21-day dermal toxicity study with rabbits, no systemic or dermal toxicity was seen following repeated applications of glyphosate at 0, 100, 1,000, or 5,000 mg/kg/day. The NOAEL was 1,000 mg/kg/day and the LOAEL was 5,000 mg/kg/day based on decreased food consumption in males. In addition, the use of 3% dermal absorption rate (estimated) in conjunction with the oral NOAEL of 175 mg/kg/day established in the rabbit development study yields a dermal equivalent dose of greater than 5,000 mg/kg/day.

Based on the low toxicity of the formulation product (Toxicity Category III and IV) and the physical characteristics of the technical

product, there is minimal concern for potential inhalation exposure or risk. The acute inhalation study was waived for technical glyphosate. Some glyphosate end-use products are in Toxicity Category I or II for eye or dermal irritation. The Reregistration Eligibility Decision Document for Glyphosate (September 1993) indicates that the Agency is not adding any additional personal protective equipment (PPE) requirements to labels of end-use products, but that it continues to recommend the PPE and precautionary statements required for end-use products in Toxicity Categories I and II.

3. Chronic toxicity. EPA has established the Reference Dose (RfD) for glyphosate at 2.0 mg/kg/day. This RfD is based on the maternal NOAEL of 175 mg/kg/day from a rabbit developmental study and a 100-fold uncertainty factor.

4. Carcinogenicity. Glyphosate has been classified as a Group E chemical - no evidence of carcinogenicity in two acceptable animal species.

C. Exposures and Risks

1. From food and feed uses. Tolerances have been established (40 CFR 180.364) for the residues of glyphosate (N-(phosphonomethyl)glycine and its metabolite aminomethylphosphonic acid resulting from the application of the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate, in or on a variety of raw agricultural commodities. Tolerances are established on kidney of cattle, goats, hogs, horses, and sheep at 4.0 ppm; liver of cattle, goats, hogs, horses, and sheep at 0.5 ppm; and liver and kidney of poultry at 0.5 ppm. Risk assessments were conducted by EPA to assess dietary exposures from glyphosate as follows:

i. Acute exposure and risk. Acute dietary risk assessments are performed for a food-use pesticide if a toxicological study has indicated the possibility of an effect of concern occurring as a result of a 1-day or single exposure. An acute dietary risk assessment was not performed because no endpoints attributable to single dose were identified in the oral studies including rat and rabbit developmental studies. There are no data requirements for acute and subchronic neurotoxicity studies and no evidence of neurotoxicity in any of the toxicity studies at very high doses. The Agency concludes with reasonable certainty that glyphosate dose not elicit an acute toxicological response. An acute dietary risk assessment is not needed.

ii. Chronic exposure and risk. The chronic dietary exposure analysis was conducted using the (RfD) of 2.0 mg/kg/day based on the maternal NOAEL of 175 mg/kg/day from a developmental study and an uncertainty factor of 100 (applicable to all population groups). The Dietary Exposure Evaluation Model (DEEM) analysis assumed tolerance levels residues and 100% of the crop treated. These assumptions resulted in the following theoretical maximum residue contributions (TMRCs) and percent of the RfDs for certain population subgroups. The TMRC for the US population (48 states) was 0.029960 or 1.5% of the RfD, 0.026051 or 1.3% of the RfD for nursing infants (less than 1 year old), 0.065430 or 3.3% of the RfD for non-nursing infants less than 1 year old; 0.064388 or 3.2% of the RfD for children (1-6 years old); 0.043017 or 2.2% of the RfD for children (7-12 years old); 0.030928 or 1.5% of the RfD for females (13+/-nursing); 0.030241 or 1.5% of the RfD for non-Hispanic whites; and 0.030206 or 1.5% of the RfD for non-Hispanic blacks.

2. From drinking water. Generic expected environmental concentration (GENEEC) and Screening concentration and ground water (SCI-GROW) models were run to produce estimates of glyphosate concentrations in surface and ground water, respectively. The drinking water exposure for glyphosate from the ground water screening model, SCI-GROW, yields a peak and chronic Estimated Environmental Concentration (EEC) of 0.0011 parts per billion (ppb) in ground water. The GENEEC values represent upper-bound estimates of the concentrations that might be found in surface water due to glyphosate use. Thus, the

GENEEC model predicts that glyphosate surface water concentrations range from a peak of 1.64 ppb to a 56-day average of 0.19 ppb. The model estimates are compared to chronic drinking water levels of comparison (DWLOC (chronic)). The DWLOC (chronic) is the theoretical concentration of glyphosate in drinking water so that the aggregate chronic exposure (food + water + residential) will occupy no more than 100% of the RfD. Glyphosate is registered for residential products, however, a residential exposure assessment is not required, since there are no endpoints selected for either dermal or inhalation exposure. The Agency's default body weights and consumption values used to calculate DWLOCs are as follows: 70 kilograms/liter (kg/2L) (adult male), 60 kg/2L (adult female), and 10 kg/1L (child).

i. Acute exposure and risk. An acute dietary endpoint and dose was not identified in the toxicology data base. Adequate rat and rabbit developmental studies did not provide a dose or endpoint that could be used for acute dietary risk purposes. Additionally, there were no data requirements for acute or subchronic rat neurotoxicity studies since there was no evidence of neurotoxicity in any of the toxicology studies at very high doses.

ii. Chronic exposure and risk. The DWLOC (chronic) (non-cancer) risk is calculated by multiplying the chronic water exposure (mg/kg/day) x (body weight) divided by the consumption (L) x 10^{-3} mg/g. The DWLOCs are 69,000 g/L for the U.S. population in 48 states, males (13+), non-Hispanic whites, and non-Hispanic blacks; and 19,000 g/L for non-nursing infants (less than 1 year old) and children (1-6 years). The GENECC and SCI-GROW estimated that average concentrations of glyphosate in the surface and ground water are less than the DWLOC (chronic). Therefore, taking into account present uses and uses proposed in this action, the Agency concludes with reasonable certainty that no harm will result from chronic aggregate exposure to glyphosate.

3. From non-dietary exposure. Glyphosate is currently registered for use on the following residential non-food sites: Around ornamentals, shade trees, shrubs, walk, driveways, flower beds and home lawns. Based on the registered uses of glyphosate, the potential for residential exposures exists. However, based on the low acute toxicity and lack of other toxicological concerns, glyphosate does not meet the Agency's criteria for residential data requirements. Exposures from residential uses are not expected to pose undue risks or harm to public health.

i. Acute exposure and risk. There are no acute toxicological concerns for glyphosate. Glyphosate has been the subject of numerous incident reports, primarily for eye and skin irritation injuries, in California. Some glyphosate end-use products are in Toxicity

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Categories I and II for eye and dermal irritation. The Reregistration Eligibility Decision Document for Glyphosate (September 1993) indicates the Agency is not adding additional PPE requirements to labels of end-use products, but that it continues to recommend the PPE and precautionary statements required for end-use products in Toxicity Categories I and II.

ii. Chronic exposure and risk. Although there are registered residential uses for glyphosate, glyphosate does not meet the Agency's criteria for residential data requirements, due to the lack of toxicological concerns. Incidental acute and/or chronic dietary exposures from residential uses of glyphosate are not expected to pose undue risks to the general population, including infants and children.

iii. Short- and intermediate-term exposure and risk. EPA identified no toxicological concerns for short-intermediate-and long-term dermal or inhalation routes of exposures. The Agency concludes that exposures from residential uses of glyphosate are not expected to pose undue risks.

4. Cumulative exposure to substances with a common mechanism of

toxicity. Section 408(b)(2)(D)(v) requires that, when considering whether to establish, modify, or revoke a tolerance, the Agency consider ``available information'' concerning the cumulative effects of a particular pesticide's residues and ``other substances that have a common mechanism of toxicity.''

EPA does not have, at this time, available data to determine whether glyphosate has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, glyphosate does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that glyphosate has a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the final rule for Bifenthrin Pesticide Tolerances (62 FR 62961, November 26, 1997).

D. Aggregate Risks and Determination of Safety for U.S. Population

1. Acute risk. There was no acute dietary endpoint identified, therefore there are no acute toxicological concerns for glyphosate.

2. Chronic risk. Using the TMRC exposure assumptions described in this unit, EPA has concluded that aggregate exposure to glyphosate from food will utilize 1.5% of the RfD for the U.S. population. The major identifiable subgroup with the highest aggregate exposure is non-nursing infants (less than 1 year old) and children (1-6 years) as discussed below. EPA generally has no concern for exposures below 100% of the RfD because the RfD represents the level at or below which daily aggregate dietary exposure over a lifetime will not pose appreciable risks to human health. Despite the potential for exposure to glyphosate in drinking water and from non-dietary, non-occupational exposure, EPA does not expect the aggregate exposure to exceed 100% of the RfD. EPA concludes that there is a reasonable certainty that no harm will result from aggregate exposure to glyphosate residues.

3. Short- and intermediate-term risk. Short- and intermediate-term aggregate exposure takes into account chronic dietary food and water (considered to be a background exposure level) plus indoor and outdoor residential exposure. Short- and intermediate-term dermal and inhalation risk is not a concern due to the lack of significant toxicological effects observed with glyphosate under these exposure scenarios.

4. Aggregate cancer risk for U.S. population. Glyphosate has been classified as a Group E chemical, with no evidence of carcinogenicity for humans in two acceptable animal studies.

5. Determination of safety. Based on these risk assessments, EPA concludes that there is a reasonable certainty that no harm will result from aggregate exposure to residues.

E. Aggregate Risks and Determination of Safety for Infants and Children

1. Safety factor for infants and children--i. In general. In assessing the potential for additional sensitivity of infants and children to residues of glyphosate, EPA considered data from developmental toxicity studies in the rat and rabbit and a 2-generation reproduction study in the rat. The developmental toxicity studies are designed to evaluate adverse effects on the developing organism resulting from maternal pesticide exposure during gestation. Reproduction studies provide information relating to effects from exposure to the pesticide on the reproductive capability of mating animals and data on systemic toxicity.

FFDCA section 408 provides that EPA shall apply an additional tenfold margin of safety for infants and children in the case of threshold effects to account for prenatal and postnatal toxicity and the completeness of the data base unless EPA determines that a

different margin of safety will be safe for infants and children. Margins of safety are incorporated into EPA risk assessments either directly through use of a margin of exposure (MOE) analysis or through using uncertainty (safety) factors in calculating a dose level that poses no appreciable risk to humans. EPA believes that reliable data support using the standard uncertainty factor (usually 100 for combined interspecies and intraspecies variability) and not the additional tenfold MOE/uncertainty factor when EPA has a complete data base under existing guidelines and when the severity of the effect in infants or children or the potency or unusual toxic properties of a compound do not raise concerns regarding the adequacy of the standard MOE/safety factor.

ii. Prenatal and postnatal sensitivity. The oral perinatal and prenatal data demonstrated no indication of increased sensitivity of rats or rabbits to in utero and postnatal exposure to glyphosate.

iii. Conclusion. There is a complete toxicity data base for glyphosate and exposure data are complete or are estimated based on data that reasonably accounts for potential exposures. Based on these data, there is no indication that the developing fetus or neonate is more sensitive than adult animals. No developmental neurotoxicity studies are being required at this time. A developmental neurotoxicity data requirement is an upper tier study and required only if effects observed in the acute and 90-day neurotoxicity studies indicate concerns for frank neuropathy or alterations seen in fetal nervous system in the developmental or reproductive toxicology studies. The Agency believes that reliable data support the use of the standard 100-fold uncertainty factor, and that a tenfold (10x) uncertainty factor is not needed to protect the safety of infants and children.

2. Acute risk. There are no acute toxicological endpoints for glyphosate. The Agency concludes that establishment of the proposed tolerances would not pose an unacceptable aggregate risk.

3. Chronic risk. Using the exposure assumptions described in this unit, EPA has concluded that aggregate exposure to glyphosate from food will utilize 3.3% of the RfD for infants and children. EPA generally has no concern for exposures below 100% of the RfD because the RfD represents the level at or below which daily aggregate dietary

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exposure over a lifetime will not pose appreciable risks to human health. Despite the potential for exposure to glyphosate in drinking water and from non-dietary, non-occupational exposure, EPA does not expect the aggregate exposure to exceed 100% of the RfD.

4. Short- or intermediate-term risk. Short-term and intermediate-term dermal and inhalation risk is not a concern due to the lack of significant toxicological effects observed with glyphosate under these exposure scenarios.

5. Determination of safety. Based on these risk assessments, EPA concludes that there is a reasonable certainty that no harm will result to infants and children from aggregate exposure to glyphosate residues.

IV. Other Considerations

A. Metabolism in Plants and Animals

The qualitative nature of the residue in plants is adequately understood. Studies with a variety of plants including corn, cotton, soybeans, and wheat indicate that the uptake of glyphosate or its metabolite, aminomethylphosphonic acid (AMPA), from soil is limited. The material which is taken up is readily translocated. Foliarly applied glyphosate is readily absorbed and translocated throughout the trees or vines to the fruit of apples, coffee, dwarf citrus (calamondin), pears and grapes. Metabolism via N-methylation yields N-methylated glycines and phosphonic acids. For the most part, the ratio of glyphosate to AMPA is 9 to 1 but can approach 1 to 1 in a few cases

(e.g., soybeans and carrots). Much of the residue data for crops reflect a detectable residue of parent (0.05 - 0.15 ppm) along with residues below the level of detection (<0.05 ppm) of AMPA. The terminal residue to be regulated in plants is glyphosate per se.

The qualitative nature of the residue in animals is adequately understood. Studies with lactating goats and laying hens fed a mixture of glyphosate and AMPA indicate that the primary route of elimination was by excretion (urine and feces). These results are consistent with metabolism studies in rats, rabbits, and cows. The terminal residues in eggs, milk, and animal tissues are glyphosate and its metabolite AMPA; there was no evidence of further metabolism. The terminal residue to be regulated in livestock is glyphosate per se.

B. Analytical Enforcement Methodology

Adequate enforcement methods are available for analysis of residues of glyphosate in or on plant commodities. These methods include GLC (Method I in Pesticides Analytical Manual (PAM) II; the limit of detection is 0.05 ppm) and High Performance Liquid Chromatography (HPLC) with fluorometric detection. Use of the GLC method is discouraged due to the lengthiness of the experimental procedure. The HPLC procedure has undergone successful Agency validation and was recommended for inclusion in PAM II. A GC/MS method for glyphosate in crops has also been validated by EPA's Analytical Chemistry Laboratory (ACL).

C. Magnitude of Residues

The available crop field trial residue data support established tolerances for glyphosate. Application of glyphosate as the acid will not result in residues which exceed currently established tolerances.

D. International Residue Limits

Codex Maximum Residue Levels (MRLs) exist for barley, dry peas, dry beans, and canola seed at 20, 5, 2, and 10 pp, respectively for glyphosate. Canadian glyphosate MRLs exist for barley, barley milling fractions, peas, beans, and lentils at 10, 15, 5, 2, and 4 ppm, respectively. Mexican glyphosate MRLs exist for barley, peas, and beans at 0.1, 0.2, and 0.2 ppm, respectively. Application of glyphosate as the acid in the United States will not cause any new conflicts with existing MRLs.

E. Rotational Crop Restrictions

Glyphosate labels currently bear a 30-day minimum plant back interval for crops on which the use of glyphosate is not registered.

V. Conclusion

Therefore, the tolerances are established for residues of glyphosate (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate and/or the monoammonium salt of glyphosate in or on the raw agricultural commodities.

VI. Objections and Hearing Requests

Under section 408(g) of the FFDCA, as amended by the FQPA, any person may file an objection to any aspect of this regulation and may also request a hearing on those objections. The EPA procedural regulations which govern the submission of objections and requests for hearings appear in 40 CFR part 178. Although the procedures in those regulations require some modification to reflect the amendments made to the FFDCA by the FQPA of 1996, EPA will continue to use those

procedures, with appropriate adjustments, until the necessary modifications can be made. The new section 408(g) provides essentially the same process for persons to ``object'' to a regulation for an exemption from the requirement of a tolerance issued by EPA under new section 408(d), as was provided in the old FFDCA sections 408 and 409. However, the period for filing objections is now 60 days, rather than 30 days.

A. What Do I Need To Do To File an Objection or Request a Hearing?

You must file your objection or request a hearing on this regulation in accordance with the instructions provided in this unit and in 40 CFR part 178. To ensure proper receipt by EPA, you must identify docket control number OPP-300946 in the subject line on the first page of your submission. All requests must be in writing, and must be mailed or delivered to the Hearing Clerk on or before January 24, 2000.

1. Filing the request. Your objection must specify the specific provisions in the regulation that you object to, and the grounds for the objections (40 CFR 178.25). If a hearing is requested, the objections must include a statement of the factual issues(s) on which a hearing is requested, the requestor's contentions on such issues, and a summary of any evidence relied upon by the objector (40 CFR 178.27). Information submitted in connection with an objection or hearing request may be claimed confidential by marking any part or all of that information as CBI. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. A copy of the information that does not contain CBI must be submitted for inclusion in the public record. Information not marked confidential may be disclosed publicly by EPA without prior notice.

Mail your written request to: Office of the Hearing Clerk (1900), Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. You may also deliver your request to the Office of the Hearing Clerk in Rm. M3708, Waterside Mall, 401 M St., SW., Washington, DC 20460. The Office of the Hearing Clerk is open from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Office of the Hearing Clerk is (202) 260-4865.

2. Tolerance fee payment. If you file an objection or request a hearing, you must also pay the fee prescribed by 40 CFR 180.33(i) or request a waiver of that fee pursuant to 40 CFR 180.33(m). You must mail the fee to: EPA Headquarters Accounting Operations Branch, Office of Pesticide Programs, P.O. Box

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360277M, Pittsburgh, PA 15251. Please identify the fee submission by labeling it ``Tolerance Petition Fees.''

EPA is authorized to waive any fee requirement ``when in the judgement of the Administrator such a waiver or refund is equitable and not contrary to the purpose of this subsection.''. For additional information regarding the waiver of these fees, you may contact James Tompkins by phone at (703) 305-5697, by e-mail at tompkins.jim@epa.gov, or by mailing a request for information to Mr. Tompkins at Registration Division (7505C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460.

If you would like to request a waiver of the tolerance objection fees, you must mail your request for such a waiver to: James Hollins, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460.

3. Copies for the Docket. In addition to filing an objection or hearing request with the Hearing Clerk as described in Unit VI.A., you should also send a copy of your request to the PIRIB for its inclusion in the official record that is described in Unit I.B.2. Mail your copies, identified by docket control number OPP-300946, to: Public

Information and Records Integrity Branch, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460. In person or by courier, bring a copy to the location of the PIRIB described in Unit I.B.2. You may also send an electronic copy of your request via e-mail to: opp-docket@epa.gov. Please use an ASCII file format and avoid the use of special characters and any form of encryption. Copies of electronic objections and hearing requests will also be accepted on disks in WordPerfect 6.1/8.0 file format or ASCII file format. Do not include any CBI in your electronic copy. You may also submit an electronic copy of your request at many Federal Depository Libraries.

B. When Will the Agency Grant a Request for a Hearing?

A request for a hearing will be granted if the Administrator determines that the material submitted shows the following: There is a genuine and substantial issue of fact; there is a reasonable possibility that available evidence identified by the requestor would, if established resolve one or more of such issues in favor of the requestor, taking into account uncontested claims or facts to the contrary; and resolution of the factual issues(s) in the manner sought by the requestor would be adequate to justify the action requested (40 CFR 178.32).

VII. Regulatory Assessment Requirements

This final rule establishes a tolerance under FFDCA section 408. The Office of Management and Budget (OMB) has exempted these types of actions from review under Executive Order 12866, entitled Regulatory Planning and Review (58 FR 51735, October 4, 1993). This final rule does not contain any information collections subject to OMB approval under the Paperwork Reduction Act (PRA), 44 U.S.C. 3501 et seq., or impose any enforceable duty or contain any unfunded mandate as described under Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) (Public Law 104-4). Nor does it require any prior consultation as specified by Executive Order 13084, entitled Consultation and Coordination with Indian Tribal Governments (63 FR 27655, May 19, 1998); special considerations as required by Executive Order 12898, entitled Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629, February 16, 1994); or require OMB review or any Agency action under Executive Order 13045, entitled Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885, April 23, 1997). This action does not involve any technical standards that would require Agency consideration of voluntary consensus standards pursuant to section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113, section 12(d) (15 U.S.C. 272 note). Since tolerances and exemptions that are established on the basis of a petition under FFDCA section 408 such as the tolerance in this final rule, do not require the issuance of a proposed rule, the requirements of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 et seq.) do not apply. In addition, the Agency has determined that this action will not have a substantial direct effect on States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, entitled Federalism (64 FR 43255, August 10, 1999). Executive Order 13132 requires EPA to develop an accountable process to ensure ``meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ``Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ``substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.'' This final rule directly regulates growers, food

processors, food handlers and food retailers, not States. This action does not alter the relationships or distribution of power and responsibilities established by Congress in the preemption provisions of FFDCA section 408(n)(4).

VIII. Submission to Congress and the General Accounting Office

The Congressional Review Act, 5 U.S.C. 801 et seq. , as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of this final rule in the Federal Register. This final rule is not a ``major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 180

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests, Reporting and recordkeeping requirements.

Dated: November 9, 1999.

James Jones,
Director, Registration Division, Office of Pesticide Programs.
Therefore, 40 CFR chapter I is amended as follows:

PART 180 [AMENDED]

1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 321(q), (346a) and 371.

2. In Sec. 180.364, by revising paragraph (a)(1) introductory text, paragraph (a)(2) introductory text, and paragraph (a)(3) introductory text to read as follows:

Sec. 180.364 Glyphosate; tolerances for residues.

(a) General. (1) Tolerances are established for the combined residues of glyphosate, (N-

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(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate, and/or the monoammonium salt of glyphosate in or on the following food commodities:

* * * * *

(2) Tolerances are established for the residues of glyphosate, (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate, and/or the monoammonium salt of glyphosate in or on the following food commodities:

* * * * *

(3) Tolerances are established for the residues of glyphosate, (N-(phosphonomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate, and/or the monoammonium salt of glyphosate in or on the following food commodities:

* * * * *

[FR Doc. 99-30408 Filed 11-23-99; 8:45 am]

BILLING CODE 6560-50-F

Exhibit 24



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

AUTHENTICATION

I, Delores Barber, attest that I am the Director of the Information Technology and Resources Management Division (ITRMD) of the United States Environmental Protection Agency (EPA or Agency) and that the attached documents are true, correct, and compared copies of the file copies in my legal custody, consisting of:

Document Dated: September 27, 2002

Federal Register, Glyphosate; Pesticide Tolerances Final Rule (29 pages)

Subscribed under the penalty of perjury on this 7th day of June, 2018.

Delores Barber

Delores Barber, Director
Information Technology and Resources Management Division (ITRMD)

CERTIFICATION OF TRUE COPY

I, Wendy Blake, certify that I am the Associate General Counsel, General Law Office, Office of General Counsel, of the United States Environmental Protection Agency; that I am the designee of the General Counsel for the purpose of executing certifications under 40 C.F.R. sec. 2.406; that I have duties in Washington, District of Columbia; and that the official whose signature appears above has legal custody pursuant to 40 C.F.R. sec. 2.406 of the original documents, copies of which are attached, as witnessed by my signature and the official seal of the United States Environmental Protection Agency.



Wendy L. Blake

Wendy L. Blake
Associate General Counsel
General Law Office
Office of General Counsel

Date: 6/11/18

LEGAL STATUS

LEGAL STATUS

Glyphosate; Pesticide Tolerances

A Rule by the Environmental Protection Agency on 09/27/2002

DOCUMENT DETAILS**Printed version:**

PDF (<https://www.gpo.gov/fdsys/pkg/FR-2002-09-27/pdf/02-24488.pdf>)

Publication Date:

09/27/2002 (/documents/2002/09/27)

Agency:

Environmental Protection Agency (<https://www.federalregister.gov/agencies/environmental-protection-agency>)

Dates:

This regulation is effective September 27, 2002. Objections and requests for hearings, identified by docket ID number OPP-2002-0232, must be received on or before November 26, 2002.

Effective Date:

09/27/2002

Document Type:

Rule

Document Citation:

67 FR 60934

Page:

60934-60950 (17 pages)

CFR:

40 CFR 180

Agency/Docket Numbers:

OPP-2002-0232

FRL-7200-2

Document Number:

02-24488

DOCUMENT DETAILS**PUBLISHED DOCUMENT****AGENCY:**

Environmental Protection Agency (EPA).

ACTION:

Final rule.

SUMMARY:

This regulation establishes tolerances for residues of glyphosate in or on animal feed, nongrass group; grass, forage, fodder and hay, group and adds the potassium salt of glyphosate to the tolerance expression.

Monsanto Company requested this tolerance under the Federal Food, Drug, and Cosmetic Act, as amended by the Food Quality Protection Act of 1996.

DATES:

This regulation is effective September 27, 2002. Objections and requests for hearings, identified by docket ID number OPP-2002-0232, must be received on or before November 26, 2002.

ADDRESSES:

Written objections and hearing requests may be submitted by mail, in person, or by courier. Please follow the detailed instructions for each method as provided in Unit VI. of the **SUPPLEMENTARY INFORMATION**. To ensure proper receipt by EPA, your objections and hearing requests must identify docket ID number OPP-2002-0232 in the subject line on the first page of your response.

FOR FURTHER INFORMATION CONTACT:

By mail: James A. Tompkins (PM 25), Registration Division (7505C), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460; telephone number: (703) 305-5697; e-mail address: *Tompkins.Jim@epa.gov* (*mailto:Tompkins.Jim@epa.gov*).

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this Action Apply to Me?

You may be affected by this action if you are an agricultural producer, food manufacturer, or pesticide manufacturer. Potentially affected categories and entities may include, but are not limited to:

Categories	NAICS codes	Examples of potentially affected entities
Industry	111	Crop production
	112	Animal production
	311	Food manufacturing
	32532	Pesticide manufacturing

This listing is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. Other types of entities not listed in the table could also be affected. The North American Industrial Classification System (NAICS) codes have been provided to assist you and others in determining whether or not this action might apply to certain entities. If you have questions regarding the applicability of this action to a particular entity, consult the person listed under **FOR FURTHER INFORMATION CONTACT**.

B. How Can I Get Additional Information, Including Copies of this Document and Other Related Documents?

1. *Electronically.* You may obtain electronic copies of this document, and certain other related documents that might be available electronically, from the EPA Internet home page at <http://www.epa.gov/> (<http://www.epa.gov/>). To access this document, on the home page select "Laws and Regulations,"

“Regulations and Proposed Rules,” and then look up the entry for this document under the “**Federal Register**—Environmental Documents.” You can also go directly to the **Federal Register** listings at <http://www.epa.gov/fedrgstr/> (<http://www.epa.gov/fedrgstr/>). A frequently updated electronic version of 40 CFR part 180 (/select-citation/2002/09/27/40-CFR-180) is available at http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_40/40cfr180_00.html (http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_40/40cfr180_00.html), a beta site currently under development. To access the OPPTS Harmonized Guidelines referenced in this document, go directly to the guidelines at <http://www.epa.gov/opptsfrs/home/guidelin.htm> (<http://www.epa.gov/opptsfrs/home/guidelin.htm>).

2. *In person.* The Agency has established an official record for this action under docket ID number OPP-2002-0232. The official record consists of the documents specifically referenced in this action, and other information related to this action, including any information claimed as Confidential Business Information (CBI). This official record includes the documents that are physically located in the docket, as well as the documents that are referenced in those documents. The public version of the official record does not include any information claimed as CBI. The public version of the official record, which includes printed, paper versions of any electronic comments submitted during an applicable comment period is available for inspection in the Public Information and Records Integrity Branch (PIRIB), Rm. 119, Crystal Mall #2, 1921 Jefferson Davis Hwy., Arlington, VA, from 8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The PIRIB telephone number is (703) 305-5805.

II. Background

In the **Federal Register** of April 17, 2002 (FR 67 18894) (FRL-6830-5), EPA issued a notice pursuant to section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. 346 (<https://api.fdsys.gov/link?collection=uscode&title=21&year=mostrecent§ion=346&type=usc&link-type=html>), as amended by the Food Quality Protection Act of 1996 (FQPA) (Public Law 104-170 (<https://api.fdsys.gov/link?collection=plaw&congress=104&lawtype=public&lawnum=170&link-type=html>)), announcing the filing of pesticide petitions (PP oFo6130, oFo6195, and oFo6273) by Monsanto, 600 13th St., NW., Suite 660, Washington, DC 20005. □ The notice included a summary of the petition prepared by Monsanto, the registrant. Comments received in the public docket with respect to the Notice of Filing Pesticide Petitions to Establish a Tolerance for Glyphosate in or on Food (April 17, 2002, 67 FR 18894 (/citation/67-FR-18894)) are discussed in the section below.

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III. Response to Comments

The Northwest Coalition for Alternatives to Pesticides (NCAP) researches and cites studies that are not included in corporate evaluations of their products, and summarizes them in the Journal of Pesticide Reform. The following comments submitted to the Agency by Jill Davies/RiverCare, Martha T. Franks/Taylor Farms and Jeff Schahczenski/Executive Director/Western Sustainable Agriculture Working Group cite the opinions of the NCAP concerning the information contained within the April 17, 2002 **Federal Register** for glyphosate.

A. Residue Chemistry

The Notice states:

1. *Plant metabolism.* The nature of the residue in plants is adequately understood and consists of the parent, glyphosate and its metabolite aminomethyl-phosphonic acid (AMPA). Only the glyphosate parent is to be regulated in plant and animal commodities since the metabolite AMPA is not of toxicological concern in

food.

Comment: The metabolite AMPA is of toxicological concern. In subchronic (midterm) tests on rats, AMPA caused an increase in the activity of an enzyme, lactic dehydrogenase, in both sexes; a decrease in liver weights in males at all doses tested; and excessive cell division in the lining of the urinary bladder in both sexes.

Agency response. The subchronic toxicity of AMPA has been investigated in rats and dogs. Treatment-related effects, such as urinary tract irritation, were observed in rats only at very high dosage levels. Gross and histopathologic examinations of these animals did not reveal effects in any other organ. No toxicities occurred in dogs at any dosage level tested. Based on these results, the Agency concluded that the metabolite of glyphosate, AMPA, is not of toxicological concern because the effects observed in subchronic toxicity studies cited above were: (1) Not dose-related, and/or (2) not considered biologically significant.

Comment: The mode of action of the residue in plants is not adequately understood. It is known that glyphosate is a systemic and non-selective herbicide that kills grasses, sedges, and broad-leaved plants, but exactly how it works is not well understood.

Agency response. Residue chemistry/plant metabolism studies for pesticidal active ingredients are not designed to determine the mode-of-action in plants, but instead are designed to determine the metabolic fate, including the identification of plant metabolites of the active ingredient, when it is systemically present in plants.

Although not relevant to nature of the residue studies, the primary mode of action for glyphosate is well understood and documented. Glyphosate is a member of the phosphono amino acid class of chemicals. These compounds are foliar-applied herbicides that interfere with normal plant amino acid synthesis, resulting in the inhibition of nucleic acid metabolism and protein synthesis. Specifically, glyphosate blocks the activity of 5-enolpyruvylshikimate 3-phosphate synthase (EPSP synthase), an enzyme that is involved in aromatic amino acid biosynthesis (essential for growth) and produced only by green plants. This pathway does not occur in animals, which must eat plants to obtain these essential amino acids. Consequently, glyphosate is toxic to all green plants and essentially nontoxic to other living organisms.

B. Toxicological Profile

The Notice states:

1. *Acute toxicity.* Several acute toxicology studies place technical-grade glyphosate in Toxicity Category III and Toxicity Category IV.

Comment: This is correct, and Toxicity Category III means caution. But most toxicology studies are conducted using glyphosate alone, not the formulations that are in commercial products, which contain so-called inert ingredients. Roundup, which contains glyphosate and the surfactant POEA, is three times as acutely toxic to rats as glyphosate alone. This deficiency in regulation needs to be corrected.

Agency response. This action establishes a tolerance for glyphosate, not the inert polyethylated tallow amines (POEA). POEA is regulated separately under FFDCA and has been approved by the Agency. Additionally, under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. 136 (<https://api.fdsys.gov/link?collection=uscode&title=7&year=mostrecent§ion=136&type=usc&link-type=html>) *et seq.*, registration process, EPA evaluates the potential risks posed by inert ingredients such as

the POEA. The Agency requires a full disclosure of inert ingredients for each Roundup formulation to determine acute toxicity such as acute oral, eye, skin, inhalation, and dermal sensitization. The combined effects of active and inert ingredients on a product's acute toxicity properties are reviewed by the Agency and used to define the appropriate personal protective equipment (PPE) and precautionary statements for each pesticide end-use product label that will provide adequate protection to users.

2. Genotoxicity (mutagenicity)—Comment: The FR Notice describes assays showing that glyphosate does not cause genetic damage, but other studies have shown that both glyphosate and its commercial products are mutagenic, and the commercial products are more potent mutagens than glyphosate.

Agency response. The mutagenicity studies referred to by the commenters is the *Journal of Pesticide Reform* (JPR), a magazine produced by the Northwest Coalition for Alternatives to Pesticides (NCAP) based in Eugene, OR. JPR has compiled and updated fact sheets on a number of pest-control products, including glyphosate (the active ingredient in Roundup agricultural herbicides).

Based on the negative responses observed in well validated assays conducted according to the required test guidelines and in compliance with USEPA Good Laboratory Practice Standards, the Agency concluded that the active ingredient pesticide, glyphosate, is neither mutagenic or clastogenic.

Several studies have tested herbicide formulations, including Roundup, for mutagenic/genotoxic potential. Although positive responses have been reported, the testing systems used in the cited studies may not be adequate for regulatory purposes for one or more of the following reasons: (1) Un-validated test systems that do not have established predictability based on broad experience using substances of known positive and negative genotoxicity/mutagenicity; (2) undocumented and uncharacterized test materials; (3) administered doses that cannot be correlated to expected exposures; (4) routes of exposure that vary from the required test protocols; (5) results that address endpoints which do not have a clear accepted relationship to human disease; and/or (6) deficient methodologies.

3. Reproductive and developmental toxicity—Comment: A study in Ontario found that father's (mostly farmers) use of glyphosate was associated with an increase in miscarriages and premature births in farm families. Laboratory studies on rats and rabbits have also demonstrated a number of effects from glyphosate on reproduction.

Agency response. Data from studies conducted according to accepted testing methods and reviewed by the Agency, demonstrate that glyphosate is not a reproductive or developmental toxicant. Glyphosate was evaluated in two multigenerational rat reproduction studies and developmental toxicity studies in rats and rabbits. Results from these studies did not indicate any adverse effects on the animals' ability to mate, conceive, carry or deliver normal offspring. Based on the findings from developmental toxicity studies in rats and rabbits, it can be concluded that glyphosate does not produce birth defects and developmental toxicity is only seen at maternally toxic doses.

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The developmental toxicity of the surfactant POEA has been evaluated and found not to be a teratogen or a developmental toxicant in rats. Subchronic toxicity studies with the surfactant and/or Roundup herbicide have also been conducted in rats, rabbits, and dogs. In these studies, gross and microscopic pathology examinations were conducted on several reproductive tissues including ovaries, uterus, testes, and epididymis. No developmental effects or changes in reproductive tissues were found in any of these evaluations. There is no evidence that the surfactant or Roundup herbicide adversely impacts reproductive function.

4. *Subchronic (medium-term) and chronic (long-term) toxicity studies on rats and mice—Comment.* Once again, studies (both subchronic and chronic) other than those cited by Monsanto reflect toxicity from glyphosate, and commercial products are more toxic than just glyphosate.

Agency response. The Agency has determined that the existing data base for glyphosate is adequate according to testing guideline requirements for a food-use registration. There is high confidence in the quality of the existing studies and the reliability of the toxicity endpoints identified for use in risk assessments; there are no data gaps. Based on evaluation of the existing glyphosate data base, the Agency has concluded that the use of glyphosate and glyphosate products do not pose unreasonable risks or adverse effects to humans.

The potential toxicity of POEA has been assessed in subchronic oral studies with rats and dogs. Roundup herbicide has also been evaluated for possible subchronic effects in an inhalation study with rats, a dermal study in rabbits, and an oral study with cattle. It was anticipated most observed effects would be related to the surface-active properties and associated irritation potential of surfactants. These studies confirm that irritation at the site of contact was the primary finding with the test material. In the oral studies conducted with POEA and Roundup, effects secondary to gastrointestinal irritation (emesis and diarrhea) were noted; decreased food consumption and decreased body weight gain. However, these effects were not dose-related in rats and dogs. In the study conducted with cattle in which slight decreases in body weight occurred, dosages of Roundup herbicide were 30 to 100 times greater than the dose typically applied to foliage for agricultural weed control purposes. There was no systemic toxicity in the inhalation and dermal studies conducted with Roundup. No indication of specific target organ toxicity was observed in any of the subchronic toxicity studies.

5. *Animal metabolism.* The Notice states:

The qualitative nature of the residue in animals is adequately understood.

Comment: This is not true. There are a multitude of established effects on animals, including humans, and the mode of action is not understood at all. Roundup kills beneficial insects (parasitoid wasps, lacewings, ladybugs) and other arthropods that are important in humus production and soil aeration, and affect growth and survival of earthworms. Acute toxicities for fish LC₅₀, the lethal concentration killing 50% of a population of test animals) range from 2 ppm to 55 ppm and increase with increases in water temperature.

Agency response. Animal metabolism studies for pesticide active ingredients do not evaluate toxicological effects, but instead are designed to determine the fate of the molecule within a mammalian metabolic system. The animal metabolism data reviewed by the Agency for glyphosate are adequate and the qualitative nature of the residue in animals is understood.

Environmental consequences of pesticide use are considered in the FIFRA registration process. Based on the current toxicity data, application rates and observance of risk management measures for the active ingredient glyphosate, EPA has determined that the risks for birds, mammals, aquatic organisms, bees and invertebrates are minimal. Glyphosate is no more than slightly toxic to fish and wild birds, and practically non-toxic to aquatic invertebrate animals. There is a very low potential for the compound to build up in the tissues of aquatic invertebrates and other aquatic organisms such as fish. The Roundup formulation is moderately to slightly toxic to freshwater fish and aquatic invertebrate animals. Glyphosate is nontoxic to

honeybees. This active ingredient pesticide as well as surfactants in the formulated products have no known effect on soil microorganisms. The reported contact lethal dose (LD₅₀) for earthworms in soil are greater than 5,000 parts per million (ppm) for both the glyphosate trimethylsulfonium salt and Roundup.

6. *Cancer*. Unit C.3.ii. of the Notice states:

There is no evidence of carcinogenic potential.

Comment: This is false. A recent Swedish Study of hairy cell leukemia (HCL), a form of non-Hodgkin's lymphoma cancer, found that people who were occupationally exposed to glyphosate herbicides had a threefold higher risk of HCL. A similar study of people with non-Hodgkin's lymphoma found exposure to glyphosate was associated with an increase risk of about the same size.

Agency response. The commenters are referring to two epidemiology studies published by Sweden. This type of epidemiologic evaluation does not establish a definitive link to cancer. Furthermore, this information has limitations because it is based solely on unverified recollection of exposure to glyphosate-based herbicides.

The carcinogenic potential of glyphosate has been evaluated in acceptable studies conducted in rats and mice. In June of 1991, the Agency concluded, following a thorough review of all available toxicity data, that glyphosate should be classified in Category E--Evidence of Non-carcinogenicity in Humans. This cancer classification was based upon the observation of no treatment-related tumors at any dose level with glyphosate tested up to the limit in rats and up to dose levels higher than the limit dose in mice, and the lack of evidence of mutagenicity/genotoxicity for glyphosate.

C. Exposure and Risk Assessments

1. *Dietary exposure.* Tolerances have been established (40 CFR 180.364 (/select-citation/2002/09/27/40-CFR-180.364)) for the residues of glyphosate in or on a variety of food and feed commodities. The petitioner proposes to add potassium salt to this list of acceptable salt forms to which the tolerances apply, and to amend or add a number of new animal feed tolerances and one food tolerance. Tolerances are also established for animal organs that may be consumed by humans (kidney at 4.0 ppm and liver at 0.5 ppm), and for poultry meat at 0.1 ppm, eggs at 0.05 ppm, and poultry meat by-products at 1.0 ppm, based on animal-feeding studies and reasonable worst-case livestock diets.

The Notice states:

□

This analysis showed that the existing livestock tolerances are sufficient for any additional dietary burden arising from the proposed feed tolerances.

Comment: It is not clear what analysis this statement is referring to. In any case, raising the tolerances in feed should result in new meat tolerance studies being done.

Agency response. EPA has conducted an analysis of the reasonable worst-case livestock diets, which include the additional dietary burden from the glyphosate feed tolerances proposed in the FR Notice. Adequate animal feeding studies are available for glyphosate in cattle, swine, and poultry. Based on the existing and proposed tolerances, the total estimated dietary burden derived from treated feed commodities (including those genetically altered to be tolerant to glyphosate) would not result in meat, milk, or egg residues that exceed currently established food tolerances on these commodities.

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2. *Drinking water—Persistence in soil—Comment:* Glyphosate is acknowledged to be extremely persistent in the soil under typical application conditions. AMPA (the primary metabolite) is even more persistent than glyphosate. Studies in eight states found that the half-life in soil (the time required for half of the original concentration of a compound to break down or dissipate) was between 119 and 958 days. AMPA has been found in lettuce and barley planted a year after glyphosate treatment.

Agency response. Based on studies conducted both in the laboratory and the field, the Agency has determined that glyphosate is readily degraded by soil microbes to AMPA which is subsequently degraded to CO₂. Data from field dissipation trials from eight sites show that the median half-life (DT₅₀) for glyphosate applied at maximum use rates was 13.9 days with a range of 2.6 (Texas) to 140.6 (Iowa). The reported half-lives from the field studies conducted in the coldest climates, i.e., Minnesota, New York, and Iowa were longest at 28.7, 127.8, and 140.6 days, respectively, indicating that the rate of glyphosate degradation is somewhat slower in cooler climates compared to milder ones. Further degradation of AMPA to CO₂ occurs at a slower rate than the initial degradation of glyphosate. Because of the strong binding of both glyphosate and AMPA to soil particles, there is very little uptake into plants of either glyphosate or AMPA from soil, even right after application of glyphosate. AMPA was found in only trace levels in lettuce and barley planted a year after application of glyphosate to soil. AMPA has been determined to not be of toxicological concern.

3. *Found in water.* The Notice states:

Glyphosate adsorbs strongly to soil and would not be expected to move vertically below the 6 inch soil layer.

Comment: This is a false assumption. Glyphosate can move into surface water when the soil particles to which it tends to bind are washed into streams or rivers. Glyphosate has been found in both ground and surface water, where it can be toxic to aquatic life for a time.

Agency response. The FR notice statement refers to behavior of glyphosate in soil and its potential for movement to ground water, not its movement into surface water. Glyphosate adsorbs strongly to soil particles, which limits its vertical movement in soil and makes contamination of ground water unlikely to occur.

Glyphosate can potentially occur in surface water from spray drift, runoff, soil particle movement, or by direct application, but at concentrations that are much lower than levels at which toxic effects to aquatic organisms may occur. The Agency has estimated glyphosate levels that could occur in surface water based on presently approved use patterns using computer-modeling methods. Based on toxicological data from acute and chronic tests on fish and other aquatic species, EPA has determined that the potential for environmental effects of glyphosate in surface water is minimal.

The Notice states:

The Agency lacks sufficient monitoring exposure data to complete a comprehensive dietary exposure analysis and risk assessment for glyphosate in drinking water. Because the Agency does not have comprehensive monitoring data, drinking water concentration estimates are made by reliance on simulation or modeling taking into account data on the physical characteristics of glyphosate.

Comment: The Agency had better get monitoring exposure data for drinking water, for both glyphosate and for AMPA.

Agency response. In November 1999, the EPA Office of Water issued a report titled “A Review of Contaminant Occurrence in Public Drinking Water Systems.” The data in the report is further discussed in the report “Occurrence Summary and Use Support Document for the Six-Year Review of National Primary Drinking Water Regulations” (draft report issued in March 2002). The study is an analysis to date of the occurrence of contaminants in public water systems (PWSs). State data bases of compliance-monitoring data from PWSs were the primary data sources for the analysis. Glyphosate monitoring data of both surface water and ground water sources for 7,800 PWSs were included in the analysis. Occurrences of detectable levels of glyphosate in ground water or surface water were very infrequent. All detections of glyphosate were below 10% of the Maximum Contaminant Level (MCL), which is the health-based maximum permissible level of a contaminant in water that is delivered to any user of a PWS. Only 0.1% of the PWSs reported any detection of glyphosate at a level above 1% of the MCL. These monitoring results are consistent with the modeling predictions discussed above, and reinforce the Agency’s conclusion that aggregate exposure to glyphosate via all exposure routes, including drinking water, will not exceed the Agency’s level of concern (100% of the cPAD).

4. *Non-dietary exposure.* The Notice states:

iii. Based on the low acute toxicity and the lack of other toxicological concerns, exposures from residential uses (e.g., for lawn and garden pest control, indoor pest control, termiticides, and flea and tick control on pets) of glyphosate are not expected to pose undue risks.

Comment: There are many toxicological concerns and in California, glyphosate exposure illness among agricultural and landscape workers is common with serious effects reported including blurred vision, peeling of skin, nausea, headache, vomiting, diarrhea, chest pain, dizziness, numbness. How does EPA define undue risks?

Agency response. Some glyphosate end-use products are assigned Toxicity Categories I and II for eye and dermal irritation because they contain POEA surfactants, which have been identified as eye and dermal irritants. For all such formulations, the Agency continues to recommend the addition of personal protective equipment (PPE) and precautionary statements appropriate for labeling of end-use products in Toxicity Categories I and II.

D. Cumulative Effects

The Notice states:

EPA does not have, at this time, available data to determine whether glyphosate has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. For the purposes of this tolerances action, therefore, EPA has not assumed that glyphosate has a common mechanism of toxicity with other substances.

Comment: When the mode of action is not clearly understood, even more uncertainty exists regarding synergistic effects with other substances. Rather than raising tolerances, EPA should be exercising the Precautionary Principle and lowering them.

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Agency response. The herbicidal mode-of-action of glyphosate in plants is well-understood (see Unit A. Residue Chemistry, Agency response of this document) but is not relevant to the determination of whether it shares a common mechanism of toxicity with other substances. Glyphosate does not appear to produce a

toxic metabolite that is also produced by other substances that could be grouped together for a cumulative risk assessment, thus at this time, EPA will not include glyphosate in such an assessment.

E. Safety Determination

U.S. population and infants and children—Comment: The mode of action of glyphosate is not understood, synergistic effects are not understood, and a multitude of studies indicate that glyphosate is toxic in all standard categories of toxicological testing. Again, rather than raising tolerances, EPA should be exercising the Precautionary Principle and lowering them.

Agency response: The herbicidal mode-of-action of glyphosate in plants is well-understood (see the previous discussion above) but is not relevant to the determination of whether it shares a common mechanism of toxicity with other substances. Glyphosate does not appear to produce a toxic metabolite that is also produced by other substances that could be grouped together for a cumulative risk assessment, thus at this time, EPA will not include glyphosate in such an assessment. In evaluating these tolerance petitions, EPA has concluded that the proposed tolerances meet the FFDCA standard of reasonable certainty of no harm. This standard requires consideration of aggregate exposure to glyphosate from existing uses as well as exposure from the new uses proposed in the petitions before EPA. EPA requires that toxicological tests conducted with individual active ingredients using validated testing methods be submitted and reviewed in support of its registration decisions. Results from a complete data base of acceptable studies conducted with glyphosate have demonstrated that adverse effects will not occur at expected exposure levels. The Agency is not aware of scientific evidence that demonstrates enhanced potency of glyphosate's toxicological effects that arise through synergistic mechanisms.

F. International Tolerances

Several maximum residue limits (MRLs) for glyphosate have been established by Codex in or on various commodities. The Codex MRL for rice grain is 0.1 ppm. The proposed rice grain tolerance of 15.0 ppm, is based on crop field trial data obtained using glyphosate-tolerant rice and therefore cannot be lowered to maintain harmonization with the Codex MRL of 0.1 ppm. (Unit F of the Notice). Also, the Codex MRL for grass hay is 50 ppm, and that proposed here is 300 ppm; the Codex MRL for field corn is 1 ppm, and that proposed here is 6 ppm and the same statement, that the tolerance cannot be lowered, applies.

Comment: Here is a great example of one of the many detrimental ramifications from the widespread use of GMO's. They drive up the levels of pesticide residues in crops for food and feed, while the majority of society is trying to avoid consumption of pesticides. It is unclear here, who has written this part of the FR Notice, EPA or Monsanto. The phrase, cannot be lowered is an ominous statement. If followed, it means that if a corporation benefits from commercializing a product, all other values and considerations must be cast aside.

Agency response. The rice grain tolerance of 15.0 ppm initially requested by Monsanto Company and cited in the notice of filing pesticide petition to establish a tolerance for glyphosate in or on food (April 17, 2002, 67 FR 18894 (/citation/67-FR-18894)) is not included in this tolerance petition. In addition, Monsanto Company has amended the tolerance petition by deleting the proposed tolerance increase to 6 ppm for wheat, grain and revising its Roundup UltraMax Herbicide label by removing all instructions related to a preharvest application of this product to Roundup Ready wheat. EPA has determined that the amended use instructions support the existing 5 ppm tolerance level for wheat, grain (40 CFR 180.364 (/select-citation/2002/09/27/40-CFR-180.364)).

The pesticide petition process exists so that petitioners can request that EPA establish new food or feed tolerances, or increase existing tolerances, to accommodate new pesticide uses. Petitions are only filed when residue studies have demonstrated that food residues requiring tolerances may occur. Although EPA's approval of such petitions does authorize the potential for increased exposure levels, the existence of food tolerances is not indicative of significant consumer risk. Using worst-case assumptions that: (1) 100% of crops will be treated and (2) that residues will occur at tolerance levels in all cases, EPA has concluded that exposure to glyphosate from food, including all present and proposed tolerances, will utilize only 1.8% of the cPAD for the U.S. population, 3.8% of the cPAD for all infants less than 1 year old, and 3.6% of the cPAD for children (1 to 6 years old). Thus, the risk to human health does not exceed the Agency's level of concern (100% of the cPAD).

The phrase cannot be lowered indicates that glyphosate use patterns in the U.S. differ from those that have been considered by Codex, and therefore the new U.S. food and/or feed tolerances are not harmonized with established Codex MRLs. Codex procedures require that new pesticide uses and tolerances must first be approved by national governments before they can be considered by the Codex Committee on Pesticide Residues. As a result, differences between Codex MRLs and U.S. tolerances are anticipated as use patterns evolve. Codex uses the Periodic Review process to periodically update MRLs to reflect the modified use patterns.

G. Conclusions

Comment: In many parts of this FR Notice, it is not possible to tell who has written it, EPA or Monsanto. As a member of an organization working hard to promote an environmentally sound, economically viable, socially just and humane agriculture and food system in this country, I was expecting to see evidence of an agency working to protect human health and our environment, this is very disappointing. Furthermore, there is no consideration given here to the effects the increased use of this pesticide may have on the soil. Lab studies have demonstrated that glyphosate reduces nitrogen fixation associated with legumes and increases the susceptibility of crop plants to a number of diseases. Roundup is toxic to *mycorrhizal* fungi, with effects on some species observed at concentrations of 1 ppm, lower than those found in soil following typical applications.

Agency response. Publication of petitioner-generated summaries is dictated by the FFDCa, 21 U.S.C. 346 (<https://api.fdsys.gov/link?collection=uscode&title=21&year=mostrecent§ion=346&type=usc&link-type=html>)a(d)(3). The Notice clearly indicates that the petitioner, Monsanto, has written the summary. However, much of this information can be found in the Agency's risk assessment document/supporting documentation for glyphosate. EPA has conducted a complete and thorough review of the available data for glyphosate. Based on the risk assessments conducted for glyphosate, the Agency determined that there is reasonable certainty that ☐ exposure to glyphosate will not pose unreasonable risks or adverse effects to humans or the environment.

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The Agency has received no reports indicating that the use of glyphosate adversely effects nitrogen fixation in legumes or that it increases the disease susceptibility of crops. These type of environmental considerations are more appropriately raised in connection with the FIFRA registration process.

H. Biotechnology Related Issues

Comment: Several comments were received in the public docket that expressed concern over the tolerance approvals for glyphosate that will directly support new uses in glyphosate-tolerant crops, namely wheat, rice and bentgrass. The list of commenters are as follows: Mark Trechock/Staff Director/Dakota Resource

Council, Annie Ray/Oregon Rural Action, Helge Hellberg/Marketing Director/California Certified Organic Farmers, Lauran Dundee/Regional Outreach Coordinator/Partners for Global Justice and Sustainable Communities, Kevin L. Williams/Field Coordinator/Western Organization of Resource Councils, Suzin Kratina/Chair of the Food Safety Task Force/Northern Plains Resource Council, Harriet Ritter and Renata Brillinger.

Agency response. The rice grain tolerance of 15.0 ppm initially requested by Monsanto Company and cited in the Notice of Filing Pesticide Petition to establish a Tolerance for Glyphosate in or on Food (April 17, 2002, 67 FR 18894 (/citation/67-FR-18894)), is not included in this final rule.

Tolerance actions for glyphosate are considered independently of the other regulatory assessments that a new crop trait must pass before it can be commercialized. Three U.S. Federal agencies regulate crops incorporating traits derived from biotechnology. The Food and Drug Administration (FDA) has responsibility for evaluating the safety of crops derived through biotechnology for use as food and feed. The U.S. Department of Agriculture, Animal Plant Health Inspection Service (USDA APHIS) is responsible for agronomic characteristics and environmental impact. EPA is responsible for the assessment of the human health and environmental risk of pesticide products, including plant-incorporated pesticides, and their registration under FIFRA, as amended. Commercialization by Monsanto of additional glyphosate-tolerant crops, i.e., wheat, rice and bentgrass, cannot occur until such time as the USDA APHIS and the FDA have received and evaluated necessary data from the registrant and granted necessary approvals. As of 2002, Monsanto has submitted a petition to USDA APHIS for GM bentgrass.

Despite the separate nature of the evaluations and approvals, much closer communication has developed between the three agencies in recent years. In early 2001, EPA and USDA APHIS established an interagency work group for products derived from biotechnology. Through this joint working group, EPA consults on a stewardship plan for each new herbicide-tolerant crop that addresses the management of pest resistance and the potential for weedy volunteer crops in their herbicide-tolerant crops and in crop rotations. This stewardship plan is then incorporated into a full environmental impact assessment by USDA APHIS that addresses the potential for development of resistant weed populations through pollen flow, in addition to effects on non-target organisms and agricultural practices. EPA and USDA APHIS have established a strong working relationship through this joint review process that helps ensure that the concerns of both agencies are adequately addressed prior to final approval by either.

Based on the incomplete status of the interagency approval process discussed above, EPA has decided not to register the use of glyphosate in or on herbicide-tolerant wheat or herbicide-tolerant bentgrass at this time.

Some commenters express concern over the potential contamination of organic crops through pollen drift from herbicide-tolerance crop varieties that may be grown on near-by farms. The issue of organic operations in proximity to operations that employ methods that are prohibited under organic rules is discussed in the National Organic Program, Final Rule, available on the USDA Web site at: <http://www.ams.usda.gov/nop/nop2000/Final%20Rule/nopfinal.pdf> (<http://www.ams.usda.gov/nop/nop2000/Final%20Rule/nopfinal.pdf>).

IV. Statutory Findings

The petition requested that 40 CFR 180.364 (/select-citation/2002/09/27/40-CFR-180.364) be amended by establishing a tolerance for residues of the herbicide glyphosate, in or on animal feed, nongrass, group at 400 part per million (ppm), grass, forage, fodder and hay, group at 300 ppm, wheat, forage at 10 ppm, wheat, hay

at 10 ppm, and adding the potassium salt of glyphosate to the tolerance expression.

Section 408(b)(2)(A)(i) of the FFDCA allows EPA to establish a tolerance (the legal limit for a pesticide chemical residue in or on a food) only if EPA determines that the tolerance is “safe.” Section 408(b)(2)(A)(ii) defines “safe” to mean that “there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information.” This includes exposure through drinking water and in residential settings, but does not include occupational exposure. Section 408(b)(2)(C) requires EPA to give special consideration to exposure of infants and children to the pesticide chemical residue in establishing a tolerance and to “ensure that there is a reasonable certainty that no harm will result to infants and children from aggregate exposure to the pesticide chemical residue. . . .”

EPA performs a number of analyses to determine the risks from aggregate exposure to pesticide residues. For further discussion of the regulatory requirements of section 408 and a complete description of the risk assessment process, see the final rule on Bifenthrin Pesticide Tolerances (62 FR 62961 (/citation/62-FR-62961), November 26, 1997) (FRL-5754-7).

V. Aggregate Risk Assessment and Determination of Safety

Consistent with section 408(b)(2)(D), EPA has reviewed the available scientific data and other relevant information in support of this action. EPA has sufficient data to assess the hazards of and to make a determination on aggregate exposure, consistent with section 408(b)(2), for a tolerance for residues of glyphosate on animal feed, nongrass, group at 400 ppm, grass, forage, fodder and hay, group at 300 ppm, wheat, forage at 10 ppm, and wheat, hay at 10 ppm. EPA's assessment of exposures and risks associated with establishing the tolerance follows.

A. Toxicological Profile

EPA has evaluated the available toxicity data and considered its validity, completeness, and reliability as well as the relationship of the results of the studies to human risk. EPA has also considered available information concerning the variability of the sensitivities of major identifiable subgroups of consumers, including infants and children. The nature of the acute toxic effects caused by glyphosate are discussed in the following Table 1 as well as the no observed adverse effect level (NOAEL) and the lowest observed adverse effect level (LOAEL) from the toxicity studies reviewed in the following Table 2. □

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Table 1.—Acute Toxicity of Glyphosate Technical

Guideline No.	Study Type	Results
870.1100	Acute oral	LD ₅₀ > 5,000 mg/kg Toxicity Category IV
870.1200	Acute dermal	LD ₅₀ > 5,000 mg/kg Toxicity Category IV
870.1300	Acute inhalation	The requirement for an acute inhalation LC ₅₀ study was waived
870.2400	Primary eye irritation	Corneal opacity or irritation clearing in 7 days or less Toxicity Category III
870.2500	Primary skin irritation	Mild or slight irritant Toxicity Category IV
870.2600	Dermal sensitization	Not a dermal sensitizer

Table 2.—Toxicity Profile of Glyphosate Technical

Guideline No.	Study Type	Results
870.3100	90-Day oral toxicity rodents - mouse	NOAEL = 1,500 mg/kg/day in males and females LOAEL = 4,500 mg/kg/day in males and females based on decreased body weight gain
870.3100	90-Day oral toxicity rodents - rat (range-finding)	NOAEL = < 50 mg/kg/day in males and females LOAEL = 50 mg/kg/day in males and females based on increased phosphorus and potassium values
870.3150	90-Day oral toxicity in rodents - rat (aminomethyl phosphoric acid - plant metabolite of glyphosate)	NOAEL = 400 mg/kg/day in males and females LOAEL = 1,200 mg/kg/day in males and females based on body weight loss and histopathological lesions of the urinary bladder.
870.3485	28-Day inhalation toxicity - rat (exposure; 6 hours/day, 5 days/week for 4 weeks)	NOAEL = 0.36 mg/L LOAEL = > 0.36 (HDT) mg/L, not established
870.3200	21-Day dermal toxicity - rabbit	NOAEL = 1,000 mg/kg/day in males and females LOAEL = 5,000 mg/kg/day based on slight erythema and edema on intact and abraded skin of both sexes, and decreased food consumption in females
870.3700	Prenatal developmental in rodents - rat	<i>Maternal</i> NOAEL = 1,000 mg/kg/day LOAEL = 3,500 mg/kg/day based on inactivity, mortality, stomach hemorrhages and reduced body weight gain <i>Developmental</i> NOAEL = 1,000 mg/kg/day LOAEL = 3,500 mg/kg/day based on increased incidence in the number of fetuses and litters with unossified sternebrae and decreased fetal body weight.
870.3700	Prenatal developmental in nonrodents - rabbit	<i>Maternal</i> NOAEL = 175 mg/kg/day LOAEL = 350 mg/kg/day based on mortality, diarrhea, soft stools, and nasal discharge. <i>Developmental</i> NOAEL = 350 mg/kg/day LOAEL = > 350 (HDT) mg/kg/day, not established
870.3800	Reproduction and fertility effects - rat (3-generation)	<i>Parental/Systemic</i> NOAEL = 30 mg/kg/day LOAEL = > 30 (HDT) mg/kg/day, not established <i>Reproductive</i> NOAEL = 30 mg/kg/day LOAEL = > 30 (HDT) mg/kg/day, not established <i>Offspring</i> NOAEL = 10 mg/kg/day LOAEL = 30 mg/kg/day based on focal dilation of the kidney in male F3b pups
870.3800	Reproduction and fertility effects - rat (2-generation)	<i>Parental/Systemic</i> NOAEL = 500 mg/kg/day in males and females LOAEL = 1,500 mg/kg/day in males and females based on soft stools, decreased body weight gain and food consumption. Focal dilation of the kidney observed at 30 mg/kg/day in the 3-generation study was not observed at any dose level in this study. <i>Reproductive</i> NOAEL = > 1,500 (HDT) mg/kg/day in males and females LOAEL = > 1,500 (HDT) mg/kg/day in males and females, not established <i>Offspring</i> NOAEL = 500 mg/kg/day in males and females LOAEL = 1,500 mg/kg/day in males and females based on reduced pup weights during the second and third weeks of lactation
870.4100	Chronic toxicity dogs	NOAEL = 500 (HDT) mg/kg/day in males and females LOAEL = > 500 mg/kg/day in males and females, not established

Guideline No.	Study Type	Results
870.4300	Chronic/carcinogenicity rats	NOAEL = 362 mg/kg/day in males LOAEL = 940 mg/kg/day in males based on decreased urinary pH, increased incidence of cataracts and lens abnormalities, and increased absolute and relative (to brain) liver weights NOAEL = 457 mg/kg/day in females LOAEL = 1,183 mg/kg/day in females based on decreased body weight gain No evidence of carcinogenicity
870.4300	Carcinogenicity mice	NOAEL = 750 mg/kg/day in males LOAEL = 4,500 mg/kg/day in males based on significant decreased body weight gain, hepatocyte necrosis, and interstitial nephritis NOAEL = 750 mg/kg/day in females LOAEL = 4,500 mg/kg/day in females based on significant decreased body weight gain, increased incidence of proximal tubule epithelial basophilia, and hypertrophy in the kidney of females No evidence of carcinogenicity
870.5100	Gene mutation assay in <i>S. typhimurium</i> strains	Negative. Non-mutagenic when tested up to 1,000 µg/plate, in presence and absence of activation, in <i>S. typhimurium</i> strains TA98, TA100, TA1535 and TA1537.
870.5100	Gene mutation assay in <i>E. coli</i> WP2hcrA and <i>S. typhimurium</i> strains	Negative for reverse gene mutation, both with and without S-9, up to 5,000 µg/plate (or cytotoxicity) with <i>E. coli</i> WP2hcrA and <i>S. typhimurium</i> TA98, TA100, TA1535, TA1537, and TA1538
870.5300	Gene mutation assay in Chinese hamster ovary (CHO) cells/HGPRT	Negative. Non-mutagenic at the HGPRT locus in Chinese hamster ovary cells tested up to cytotoxic concentrations or limit of solubility, in presence and absence of activation.
870.5385	Cytogenetics - <i>In vivo</i> bone marrow chromosomal aberration assay	Negative. Non-mutagenic in rat bone marrow chromosome assay up to 1,000 mg/kg in both sexes of Sprague Dawley rats
870.5550	Other mechanisms - <i>In vitro</i> Rec-Assay with <i>B. subtilis</i> H17 (rec+) and M45 (rec-)	There was no evidence of recombination in the rec-assay up to 2,000 µg/disk with <i>B. subtilis</i> H17 (rec+) and M45 (rec-)
870.6200	Acute neurotoxicity screening battery in rats	N/A
870.6200	Subchronic neurotoxicity screening battery in rats	N/A
870.6300	Developmental neurotoxicity in rats	N/A
870.7485	Metabolism and pharmacokinetics - rat	Absorption was 30-36% in males and females. Glyphosate was excreted unchanged in the feces and urine (97.5% minimum). The only metabolite present in the excreta was AMPA. Less than 1% of the absorbed dose remained in the carcass, primarily bone. Repeat dosing did not alter metabolism, distribution, and excretion.
870.7600	Dermal penetration	N/A

B. Toxicological Endpoints

The dose at which no adverse effects are observed (the NOAEL) from the toxicology study identified as appropriate for use in risk assessment is used to estimate the toxicological level of concern (LOC). However, the lowest dose at which adverse effects of concern are identified (the LOAEL) is sometimes used for risk assessment if no NOAEL was achieved in the toxicology study selected. An uncertainty factor (UF) is applied

to reflect uncertainties inherent in the extrapolation from laboratory animal data to humans and in the variations in sensitivity among members of the human population as well as other unknowns. An UF of 100 is \square routinely used, 10X to account for interspecies differences and 10X for intraspecies differences.

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For dietary risk assessment (other than cancer) the Agency uses the UF to calculate an acute or chronic reference dose (acute RfD or chronic RfD) where the RfD is equal to the NOAEL divided by the appropriate UF (RfD = NOAEL/UF). Where an additional safety factor is retained due to concerns unique to the FQPA, this additional factor is applied to the RfD by dividing the RfD by such additional factor. The acute or chronic Population Adjusted Dose (aPAD or cPAD) is a modification of the RfD to accommodate this type of FQPA Safety Factor.

For non-dietary risk assessments (other than cancer) the UF is used to determine the LOC. For example, when 100 is the appropriate UF (10X to account for interspecies differences and 10X for intraspecies differences) the LOC is 100. To estimate risk, a ratio of the NOAEL to exposures (margin of exposure (MOE) = NOAEL/exposure) is calculated and compared to the LOC.

The linear default risk methodology (Q*) is the primary method currently used by the Agency to quantify carcinogenic risk. The Q* approach assumes that any amount of exposure will lead to some degree of cancer risk. A Q* is calculated and used to estimate risk which represents a probability of occurrence of additional cancer cases (e.g., risk is expressed as 1×10^{-6} or one in a million). Under certain specific circumstances, MOE calculations will be used for the carcinogenic risk assessment. In this non-linear approach, a "point of departure" is identified below which carcinogenic effects are not expected. The point of departure is typically a NOAEL based on an endpoint related to cancer effects though it may be a different value derived from the dose response curve. To estimate risk, a ratio of the point of departure to exposure ($MOE_{cancer} = \text{point of departure/exposures}$) is calculated. A summary of the toxicological endpoints for glyphosate used for human risk assessment is shown in the following Table 3.

Table 3.—Summary of Toxicological Dose and Endpoints for glyphosate for Use in Human Risk Assessment

Exposure Scenario	Dose Used in Risk Assessment, UF	FQPA SF* and Level of Concern for Risk	Assessment Study and Toxicological Effects
Acute dietary (females 13-50 years old and general population)	None	None	An acute dietary endpoint was not selected for the general population or females 13-50, since an appropriate endpoint attributable to a single exposure was not identified in the toxicology data base
Chronic dietary (all populations)	NOAEL = 175 mg/kg/day UF = 100 Chronic RfD = 1.75 mg/kg/day	FQPA SF = 1 cPAD = cRfD \div FQPA SF = 1.75 mg/kg/day	Developmental toxicity study - rabbit LOAEL = 350 mg/kg/day based on diarrhea, nasal discharge and death in maternal animals

*The reference to the FQPA Safety Factor refers to any additional safety factor retained due to concerns unique to the FQPA.

Exposure Scenario	Dose Used in Risk Assessment, UF	FQPA SF* and Level of Concern for Risk	Assessment Study and Toxicological Effects
Short-, and intermediate-term incidental, oral (Residential)	NOAEL = 175 mg/kg/day	LOC for MOE = 100	Developmental toxicity study - rabbit LOAEL = 350 mg/kg/day based on diarrhea, nasal discharge and death in maternal animals
Short-, intermediate- and long-term dermal (1-30 days, 1-6 months, 6 months-lifetime) (Occupational/Residential)	None	None	Based on the systemic NOAEL of 1,000 mg/kg/day in the 21-day dermal toxicity study in rabbits, and the lack of concern for developmental and reproductive effects, the quantification of dermal risks is not required
Short-, intermediate- and long-term inhalation (1-30 days, 1-6 months, 6 months-lifetime) (Occupational/Residential)	None	None	Based on the systemic toxicity NOAEL of 0.36 mg/L (HDT) in the 28-day inhalation toxicity study in rats, and the physical characteristics of the technical (wetcake), the quantification of inhalation risks is not required
Cancer (oral, dermal, inhalation)	Cancer classification (Group E)	Risk Assessment not required	No evidence of carcinogenicity

*The reference to the FQPA Safety Factor refers to any additional safety factor retained due to concerns unique to the FQPA.

C. Exposure Assessment

1. *Dietary exposure from food and feed uses.* Tolerances have been established (40 CFR 180.364 (/select-citation/2002/09/27/40-CFR-180.364)) for the residues of glyphosate, in or on a variety of raw agricultural commodities. The current proposal to establish glyphosate tolerances at 300 and 400 ppm for animal feed, nongrass, group (Crop Group 18) and grass, forage, fodder and hay, group (Crop Group 17), respectively, is not expected to result in an increase in the dietary burden for cattle, poultry, and hogs. Respective dietary burdens of 210 ppm and 220 ppm were recently estimated by the Agency for dairy and beef cattle, including a contribution from alfalfa hay as the roughage component of the diet with a tolerance of 400 ppm. Furthermore, no impact is expected on the dietary burden to poultry or hogs since grass forage and hay are not feed items for these livestock, and the contribution from alfalfa was already considered. Risk assessments were conducted by EPA to assess dietary exposures from glyphosate in food as follows:□

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i. *Acute exposure.* Acute dietary risk assessments are performed for a food-use pesticide if a toxicological study has indicated the possibility of an effect of concern occurring as a result of a 1 day or single exposure. A review of the toxicity data base, including the developmental toxicity studies in rats and rabbits, did not provide an endpoint that could be used to quantitate risk to the general population and to females 13-50 years old from a single-dose administration of glyphosate. Therefore, no acute dietary analysis was conducted for glyphosate.

ii. *Chronic exposure.* The glyphosate chronic dietary exposure analysis was conducted using the DEEMTM software Version 7.73, which incorporates consumption data from USDA's CSFII, 1989-1992. The 1989-92 data are based on the reported consumption of more than 10,000 individuals over 3 consecutive days, and therefore represent more than 30,000 unique person days of data. Foods as consumed (i.e., apple pie) are linked to raw agricultural commodities and their food forms (i.e., apples-cooked/canned or wheat-flour) by

recipe translation files internal to the DEEM™ software. Consumption data are averaged for the entire U.S. population and within population subgroups for chronic exposure assessment, but are retained as individual consumption events for acute exposure assessment.

For chronic dietary exposure and risk assessments, an estimate of the residue level in each food or food-form (i.e., orange or orange-juice) on the commodity residue list is multiplied by the average daily consumption estimate for that food/food form. The resulting residue consumption estimate for each food/food form is summed with the residue consumption estimates for all other food/food forms on the commodity residue list to arrive at the total estimated exposure. Exposure estimates are expressed in mg/kg body weight/day and as a percent of the cPAD for chronic exposure. This procedure is performed for each population subgroup.

The Tier 1 chronic dietary exposure analysis for glyphosate is an upper bound estimate of chronic dietary exposure. The chronic dietary exposure analysis was performed for the general U.S. population and all population subgroups using DEEM™ default processing factors for rice and corn commodities, tolerance levels, and 100% crop treated data for the proposed commodities and all registered uses. For chronic dietary risk, the Agency's LOC is less than 100% cPAD. Dietary exposure estimates for representative population subgroups are presented in Table 4. The results of the chronic analysis indicate that the estimated chronic dietary risk as represented by the percent cPAD is below the Agency's LOC (100% cPAD) for the U.S. population and all population subgroups.

**Table 4.—Summary of Results from Chronic DEEM™
Analysis of Glyphosate**

Subgroup	Exposure (mg/kg/day)	% cPAD
U.S. population (total)	0.031527	1.8
All Infants (< 1 year old)	0.062218	3.6
Children (1-6 years old)	0.068016	3.9
Children (7-12 years old)	0.045529	2.6
Females (13-50 years old)	0.023477	1.3
Males (13-19 years old)	0.031938	1.8
Males (20+ years old)	0.026745	1.5
Seniors (55+ years old)	0.022733	1.3

iii. *Cancer.* The HED Cancer Peer Review Committee classified glyphosate as a Group E chemical, negative for carcinogenicity in humans, based on the absence of evidence of carcinogenicity in male and female rats as well as in male and female mice.

iv. *Anticipated residue and percent crop treated information.* The Agency used tolerance levels and 100% percent crop treated (PCT) data for the proposed commodities and all registered uses.

2. *Dietary exposure from drinking water.* The Agency lacks sufficient monitoring exposure data to complete a comprehensive dietary exposure analysis and risk assessment for glyphosate in drinking water. Because the Agency does not have comprehensive monitoring data, drinking water concentration estimates are made by reliance on simulation or modeling taking into account data on the physical characteristics of glyphosate.

The Agency uses the Generic Estimated Environmental Concentration (GENEEC) or the Pesticide Root Zone/Exposure Analysis Modeling System (PRZM/EXAMS) to estimate pesticide concentrations in surface water and SCI-GROW, which predicts pesticide concentrations in ground water. In general, EPA will use GENEEC (a tier 1 model) before using PRZM/EXAMS (a Tier 2 model) for a screening-level assessment for surface water. The GENEEC model is a subset of the PRZM/EXAMS model that uses a specific high-end runoff scenario for pesticides. GENEEC incorporates a farm pond scenario, while PRZM/EXAMS incorporate an index reservoir environment in place of the previous pond scenario. The PRZM/EXAMS model includes a percent crop area factor as an adjustment to account for the maximum percent crop coverage within a watershed or drainage basin.

None of these models include consideration of the impact processing (mixing, dilution, or treatment) of raw water for distribution as drinking water would likely have on the removal of pesticides from the source water. The primary use of these models by the Agency at this stage is to provide a coarse screen for sorting out pesticides for which it is highly unlikely that drinking water concentrations would ever exceed human health levels of concern.

Since the models used are considered to be screening tools in the risk assessment process, the Agency does not use estimated environmental concentrations (EECs) from these models to quantify drinking water exposure and risk as a %RfD or %PAD. Instead, drinking water levels of comparison (DWLOCs) are calculated and used as a point of comparison against the model estimates of a pesticide's concentration in water. DWLOCs are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food and from residential uses. Since DWLOCs address total aggregate exposure to glyphosate, they are further discussed in the aggregate risk section E. (Aggregate Risks and Determination of Safety) of this Unit.

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Based on the GENEEC and SCI-GROW models, the EECs of glyphosate for acute exposures are estimated to be 21 parts per billion (ppb) for surface water and 0.0038 ppb for ground water. The EECs for chronic exposures are estimated to be 0.83 ppb for surface water and 0.0038 ppb for ground water, based on glyphosate treatment crops. To estimate the possible concentration of glyphosate in surface water resulting from direct application to water, the Agency assumed application to a water body 6 feet deep. At an application rate of 3.75 lb acid equivalent (ae)/A, the estimated concentration is 230 ppb. Because the glyphosate water-application estimate is greater than the crop application estimate, 230 ppb is the appropriate value to use in the chronic risk estimate.

3. *From non-dietary exposure.* The term "residential exposure" is used in this document to refer to non-occupational, non-dietary exposure (e.g., for lawn and garden pest control, indoor pest control, termiticides, and flea and tick control on pets).

i. *Non-occupational (recreational) exposures.* Glyphosate is currently registered for use on the following residential non-dietary sites: Recreational areas, including parks and golf courses for control of broadleaf weeds and grasses, and lakes and ponds, including reservoirs for control of nuisance aquatic weeds. Based on the registered uses, adult and child golfers are anticipated to have short-term post-application dermal exposure at golf courses. Swimmers (adults, children and toddlers) are anticipated to have short-term post-application dermal and incidental ingestion exposures. However, since the Agency did not select dermal endpoints, no post-application dermal assessment is included; only a post-application incidental ingestion exposure assessment (swimmers) is included. Risk estimates for incidental ingestion by swimmers (adults, children, and toddlers) ranged from 7,600 to 36,000. It should be noted however, that glyphosate is used for non-selective weed control on emerged aquatic weeds. In this use pattern, it is unlikely that swimmers would

be present in waterbodies with floating weeds present. Thus, the inclusion of the swimmer incidental ingestion exposure assessment is considered by the Agency to be conservative. Table 5 presents a summary of assumptions used to estimate the exposure to adult and toddler child swimmers and the corresponding risk estimates.

Table 5.— Assumptions and Risk Estimates for Post-Application Swimmer Exposure Assessments for Glyphosate, Isopropylamine salt

Exposure Scenario	AR ₁ (lb a.e./A)	Maximum Concentration in water (mg/L) ²	Potential Dose Rate (PDR; oral mg/kg bw/day) ³	Short-term MOE ⁴
Incidental oral ingestion, adult-female	3.75	1.38	0.00493	36,000
Incidental oral, toddler			0.023	7,600

¹ Application rate from registered labels for aquatic weed control using glyphosate IPA salt (ex. label = EPA Reg. No. 524-343; max rate = 7.5 pints/A containing 4 lb ae glyphosate/gal. x 1 gal./4 pints = 3.75 lb ae/A.

² Maximum concentration in water (top 1 ft.) = 3.75 lb ae/A x 1A/43,560 ft² x 454,000 mg/lb x 1/ft x ft³/28.32 L = 1.38 mg/L.

³ PDR, incidental oral exposure = concentration, C_w (mg/L) x ingestion rate, IgR (L/hr) x exposure time, ET (hrs/d) x 1/BW (adult-female = 60 kg; toddler = 15 kg).

⁴ MOE = NOAEL/PDR; short-term incidental oral NOAEL = 175 mg/kg bw/d; The LOC for adult females and toddlers for short-term, incidental oral exposures is MOEs < 100.

The MOEs presented in Table 5 for post-application exposure by swimmers to glyphosate in aquatic weed control applications are greater than 100 and do not exceed the Agency's LOC for short-term non-occupational (recreational) exposures (MOEs less than 100).

ii. *Residential exposures.* Glyphosate, isopropylamine salt is also registered for broadcast and spot treatments on home lawns and gardens by homeowners and by lawn care operators (LCOs). Based on the registered residential use patterns, there is a potential for short-term dermal and inhalation exposures to homeowners who apply products containing glyphosate (residential handlers). Additionally, based on the results of environmental fate studies, there is also a potential for short- and intermediate-term post-application dermal exposures by adults and toddlers and incidental ingestion exposures by toddlers. However, since the Agency did not select short- or intermediate-term dermal or inhalation endpoints, no residential handler or post-application dermal assessment is included; only a post-application toddler assessment for incidental ingestion exposures is included. Risk estimates for toddler post-application incidental ingestion exposures ranged from 7,200 to greater than 10⁶. All recreational and residential exposures assessed do not exceed the Agency's level of concern (MOEs less than 100). Table 6 provides a summary of the short- and intermediate-term risk estimates for post-application incidental ingestion exposures to toddlers. □

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Table 6.— Summary of Toddler Incidental Ingestion Exposures and Risk Estimates for Residential Use of Glyphosate, Isopropylamine salt ¹

Activity	AR (lbs a.e./A) ²	Residue Estimate ³	PDR (mg/kg bw/d) ⁴	Short-/Intermediate-term MOE ⁵
Hand-to-mouth	1.62	DFR: 0.908 µg/cm ²	0.0242	7,200
Object-to-mouth		DFR: 3.63 µg/cm ²	0.00605	29,000
Soil ingestion		Soil residue: 12.2 µg/g soil	8.13 x 10 ⁻⁵	> 10 ⁶

¹ Sources: Standard Operating Procedures for Residential Exposure Assessments, Draft, December 17, 1997 and Exposure SAC Policy No. 11, February 22, 2001: Recommended Revisions to the SOPs for Residential Exposure.

² AR = maximum application rate on Roundup ProDry label (EPA Reg. No. 524-505) for residential lawn treatment.

³ Residue estimates based on the following protocol from the Residential SOPs:

a. Hand-to-mouth DFR = 1.62 lb ae/A x 0.05 x (4.54 x 10⁻⁸ µg/lb ae) x (2.47 x 10⁻⁸ A/cm²) = 0.908 g/cm².

b. Object-to-mouth DFR = 1.62 lb ae/A x 0.20 x (4.54 x 10⁻⁸ µg/lb ae) x (2.47 x 10⁻⁸ A/cm²) = 3.63 µg/cm².

Soil Residue = 1.62 lb ae/A x fraction of residue in soil (100%)/cm x (4.54 x 10⁻⁸ µg/lb ae) x (2.47 x 10⁻⁸ A/cm²) x 0.67 cm³/g = 12.2 µg/g soil.

⁴ Potential Dose Rate (PDR; already normalized to body weight of toddler).

a. Hand-to-mouth PDR = (0.908 g/cm² x 0.50 x 20 cm²/event x 20 events/hr x 10⁻³ mg/µg x 2 hrs/d)/15 kg = 0.0242 mg/kg bw/d.

Object-to-mouth PDR = (3.63 g/cm² x 25 cm²/d x 10⁻³ mg/µg)/15 kg = 0.00605 mg/kg bw/d.

Soil Ingestion PDR = (12.2 µg/g soil x 100 mg soil/d x 10⁻⁶ g/µg)/15 kg = 8.13 x 10⁻⁵ mg/kg bw/d.

⁵ MOE = NOAEL/PDR, where the short-term incidental oral NOAEL = 175 mg/kg/d the Agency's LOC is for MOEs < 100 (short-term residential).

All MOEs calculated for post-application toddler exposures do not exceed the Agency's level of concern for residential exposures (MOEs less than 100).

4. *Cumulative exposure to substances with a common mechanism of toxicity.* Section 408(b)(2)(D)(v) requires that, when considering whether to establish, modify, or revoke a tolerance, the Agency consider "available information" concerning the cumulative effects of a particular pesticide's residues and "other substances that have a common mechanism of toxicity."

EPA does not have, at this time, available data to determine whether glyphosate has a common mechanism of toxicity with other substances or how to include this pesticide in a cumulative risk assessment. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, glyphosate does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that glyphosate has a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the final rule for Bifenthrin Pesticide Tolerances (62 FR 62961 (/citation/62-FR-62961), November 26, 1997).

D. Safety Factor for Infants and Children

1. *In general.* FFDC section 408 provides that EPA shall apply an additional tenfold margin of safety for infants and children in the case of threshold effects to account for prenatal and postnatal toxicity and the completeness of the data base on toxicity and exposure unless EPA determines that a different margin of safety will be safe for infants and children. Margins of safety are incorporated into EPA risk assessments either directly through use of a margin of exposure (MOE) analysis or through using uncertainty (safety) factors in calculating a dose level that poses no appreciable risk to humans.

2. *Prenatal and postnatal sensitivity.* The toxicology data base for glyphosate is adequate according to the Subdivision F Guideline requirements for a food-use chemical. Acceptable developmental toxicity studies in the rat and rabbit are available, as is an acceptable 2-generation reproduction study in the rat. Based on the available data, the Agency determined that there is no evidence of either a quantitative or qualitative increased susceptibility following in utero glyphosate exposure to rats and rabbits, or following prenatal/postnatal exposure in the 2-generation reproduction study in rats.

3. *Conclusion.* There is a complete toxicity data base for glyphosate and exposure data are complete or are estimated based on data that reasonably accounts for potential exposures. The Agency determined that the FQPA Safety Factor to protect infants and children can be removed (reduced from 10X to 1X) for all population subgroups and exposure scenarios because:

1. The toxicology data base is complete.
2. A developmental neurotoxicity study is not required.
3. The dietary (food and drinking water) exposure assessments will not underestimate the potential exposures for infants and children.

E. Aggregate Risks and Determination of Safety

To estimate total aggregate exposure to a pesticide from food, drinking water, and residential uses, the Agency calculates DWLOCs which are used as a point of comparison against the model estimates of a pesticide's concentration in water (EECs). DWLOC values are not regulatory standards for drinking water. DWLOCs are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food and residential uses. In calculating a DWLOC, the Agency determines how much of the acceptable exposure (i.e., the PAD) is available for exposure through drinking water (e.g., allowable chronic water exposure (mg/kg/day) = cPAD - (average food + residential exposure)). This allowable exposure through drinking water is used to calculate a DWLOC.

A DWLOC will vary depending on the toxic endpoint, drinking water consumption, and body weights. Default body weights and consumption values as used by the USEPA Office of Water are used to calculate DWLOCs: 2L/70 kg (adult male), 2L/60 kg (adult female), and 1L/10 kg (child). Default body weights and drinking water consumption values vary on an individual basis. This variation will be taken into account in more refined screening-level and quantitative ☐ drinking water exposure assessments. Different populations will have different DWLOCs. Generally, a DWLOC is calculated for each type of risk assessment used: Acute, short-term, intermediate-term, chronic, and cancer.

When EECs for surface water and ground water are less than the calculated DWLOCs, EPA concludes with reasonable certainty that exposures to the pesticide in drinking water (when considered along with other sources of exposure for which EPA has reliable data) would not result in unacceptable levels of aggregate

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human health risk at this time. Because EPA considers the aggregate risk resulting from multiple exposure pathways associated with a pesticide's uses, levels of comparison in drinking water may vary as those uses change. If new uses are added in the future, EPA will reassess the potential impacts of residues of the pesticide in drinking water as a part of the aggregate risk assessment process.

1. *Acute aggregate risk (food + drinking water)*. The Agency did not identify an appropriate acute dietary endpoint that is the result of a single-dose administration of glyphosate. Accordingly, glyphosate is not expected to pose an acute risk.

2. *Chronic aggregate risk (food + drinking water)*. Using the exposure assumptions described in this unit for chronic exposure (tolerance level residues, DEEM™ default processing factors for rice and corn commodities, and 100% crop treated data for all proposed commodities and registered uses), EPA has concluded that exposure to glyphosate from food will utilize 1.8% of the cPAD for the U.S. population, 3.6% of the cPAD for [All Infants (less than 1 year old) and 3.9% of the cPAD for children 1-6 years old. The results of the chronic analysis (Table 4 in this unit) indicate that the chronic dietary risk estimates for the general U.S. population and all population subgroups associated with the existing and proposed uses of glyphosate do not exceed the Agency's LOC (less than 100% of the cPAD). Based on the use pattern, chronic residential exposure to residues of glyphosate is not expected. In addition, there is potential for chronic dietary exposure to glyphosate in drinking water. After calculating DWLOCs and comparing them to the EECs for surface and ground water, EPA does not expect the aggregate exposure to exceed 100% of the cPAD, as shown in Table 7 below:

Table 7.—Aggregate Risk Assessment for Chronic (Non-Cancer) Exposure to glyphosate

Scenario/Population Subgroup	cPAD, mg/kg/day	Chronic Food Exposure, mg/kg/day	Maximum Chronic Water Exposure ¹ , mg/kg/day	Ground Water EEC, ppb	Surface Water EEC, ppb	Chronic DWLOC ² , ppb
U.S. population	1.75	0.031527	1.718473	0.0038	230	60,000
All infants (< 1 year old)	1.75	0.062218	1.687782	0.0038	230	17,000
Children (1-6 years old)	1.75	0.068016	1.681984	0.0038	230	17,000
Children (7-12 years old)	1.75	0.045529	1.704471	0.0038	230	17,000
Females (13-50 years old)	1.75	0.023473	1.726527	0.0038	230	52,000
Males (13-19 years old)	1.75	0.031938	1.718062	0.0038	230	60,000
Males (20+ years old)	1.75	0.026745	1.723255	0.0038	230	60,000
Seniors (55+ years old)	1.75	0.022733	1.727267	0.0038	230	60,000

¹ Maximum chronic water exposure (mg/kg/day) = cPAD (mg/kg/day) - chronic food exposure from DEEM™ (mg/kg/day).

² The chronic DWLOCs were calculated as follows: DWLOC (µg/L) = maximum water exposure (mg/kg/day) x body weight (kg) ÷ consumption (L/day) x 0.001 mg/µg.

3. *Short-/intermediate-term aggregate risk (food + residential + water)*. In aggregating short-/intermediate-term risk, HED considered background chronic dietary exposure (food + water) and short-/intermediate-term incidental oral exposures (see Tables 6 and 7). Because the incidental oral ingestion

exposure estimates for toddlers from residential turf exposures (Table 7) exceeded the incidental oral exposure estimates from post-application swimmer exposures (Table 6), the Agency conducted this risk assessment using exposure estimates from just the worst-case situation. No attempt was made to combine exposures from the swimmer and residential turf scenarios due to the low probability of both occurring.

The total short-/intermediate-term food and residential aggregate MOEs are 1,800-2,300. As these MOEs are greater than 100, the short-/intermediate-term aggregate risk does not exceed the Agency's LOC. For surface water and ground water, the EECs of glyphosate are less than the DWLOCs for glyphosate in drinking water as a contribution to short-/intermediate-term aggregate exposure. Therefore, the Agency concludes with reasonable certainty that residues of glyphosate in drinking water do not contribute significantly to the short-/intermediate-term aggregate human health risk at the present time. Table 8 summarizes the short-/intermediate-term aggregate exposure to glyphosate residues. □

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Table 8.—Short/Intermediate-Term Aggregate Risk and DWLOC Calculations for Exposure to Glyphosate Residues

Population	Short-/Intermediate-Term Exposure Scenario				
	Aggregate MOE (food + residential) ¹	Aggregate Level of Concern (LOC) or Target MOE ²	Surface Water EEC ³ (ppb)	Ground Water EEC ³ (ppb)	Short/Intermediate-Term DWLOC ⁴ , (ppb)
All Infants (<1 year old)	1,900	100	230	0.0038	17,000
Children (1-6 years old)	1,800	100	230	0.0038	17,000
Children (7-12 years old)	2,300	100	230	0.0038	17,000

¹ Aggregate MOE = NOAEL ÷ (Average food exposure + Residential exposure).

² Basis for the target MOE: interspecies and intraspecies uncertainty factors totaling 100.

³ The glyphosate use producing the highest level was used.

⁴ DWLOC(μg/L or ppb) = maximum water exposure (mg/kg/day) x body weight (kg) ÷ water consumption (L) x 10⁻³ mg/μg (10 kg body weight assumed).

5. *Determination of safety.* Based on these risk assessments, EPA concludes that there is a reasonable certainty that no harm will result to the general population, and to infants and children from aggregate exposure to glyphosate residues.

VI. Other Considerations

A. Analytical Enforcement Methodology

Adequate enforcement methods are available for analysis of residues of glyphosate in or on plant and livestock commodities. These methods include GLC (Method I in Pesticides Analytical Manual (PAM) II; the limit of detection is 0.05 ppm) and HPLC with fluorometric detection. Use of the GLC method is discouraged due to the lengthiness of the experimental procedure. The HPLC procedure has undergone successful Agency validation and was recommended for inclusion in PAM II. A GC/MS method for glyphosate in crops has also been validated by EPA's Analytical Chemistry Laboratory (ACL). Thus, adequate analytical methods are

available for residue data collection and enforcement of the proposed tolerances of glyphosate in/on the nongrass animal feed crop group; the grass forage, fodder, and hay crop group; wheat forage and hay; and livestock commodities.

B. International Residue Limits

Codex and Mexican maximum residue limits (MRLs) are established for residues of glyphosate (glifosato) *per se* and Canadian MRLs are established for combined residues of glyphosate and AMPA in a variety of raw agricultural, processed, and animal commodities. Currently a relevant Codex MRL for hay or fodder (dry) of grasses is established at 50 ppm. No Canadian MRLs are established for any grass commodity. A Mexican MRL is established for pasture at 0.2 ppm. Because of the higher residue levels resulting from the proposed use pattern, harmonization of U.S. grass tolerances with existing Codex or Mexican MRLs is not possible.

For wheat-related commodities, relevant Codex MRLs exist for: wheat grain at 5 ppm; unprocessed wheat bran at 20 ppm; wheat flour at 0.5 ppm; wheat wholemeal at 5 ppm; and straw and fodder (dry) of cereal grains at 100 ppm. Canadian MRLs are established for: wheat at 5 ppm and wheat milling fractions (excluding flour) at 15 ppm. A Mexican MRL is established for wheat at 5 ppm. By maintaining the wheat, milling fractions (excluding flour) tolerance at 20 ppm, harmony with international tolerances for wheat processed fractions can be maintained.

There are currently no Codex or Canadian MRLs established for glyphosate for any nongrass animal feed items. A Mexican MRL is established for alfalfa at 200 ppm. Harmonization with this level is not possible due to the higher residue levels found in the submitted field trial studies.

C. Conditions

None.

VII. Conclusion

Therefore, the tolerance is established for residues of glyphosate, in or on animal feed, nongrass, group at 400 ppm and grass forage, fodder and hay, group at 300 ppm and the potassium salt of glyphosate is added to the tolerance expression. Based on the Agency's decision not to register tolerances for glyphosate use in or on herbicide-tolerant wheat, the current tolerances on wheat are not modified.

VIII. Objections and Hearing Requests

Under section 408(g) of the FFDCA, as amended by the FQPA, any person may file an objection to any aspect of this regulation and may also request a hearing on those objections. The EPA procedural regulations which govern the submission of objections and requests for hearings appear in 40 CFR part 178 (/select-citation/2002/09/27/40-CFR-178). Although the procedures in those regulations require some modification to reflect the amendments made to the FFDCA by the FQPA of 1996, EPA will continue to use those procedures, with appropriate adjustments, until the necessary modifications can be made. The new section 408(g) provides essentially the same process for persons to "object" to a regulation for an exemption from the requirement of a tolerance issued by EPA under new section 408(d), as was provided in the old FFDCA sections 408 and 409. However, the period for filing objections is now 60 days, rather than 30 days.

A. What Do I Need to Do to File an Objection or Request a Hearing?

You must file your objection or request a hearing on this regulation in accordance with the instructions provided in this unit and in 40 CFR part 178 (/select-citation/2002/09/27/40-CFR-178). To ensure proper receipt by EPA, you must identify docket ID number OPP-2002-0232 in the subject line on the first page of

your submission. All requests must be in writing, and must be mailed or delivered to the Hearing Clerk on or before November 26, 2002.

1. *Filing the request.* Your objection must specify the specific provisions in the regulation that you object to, and the grounds for the objections (40 CFR 178.25 (/select-citation/2002/09/27/40-CFR-178.25)). If a hearing is requested, the objections must include a statement of the factual issues(s) on which a hearing ☐ is requested, the requestor's contentions on such issues, and a summary of any evidence relied upon by the objector (40 CFR 178.27 (/select-citation/2002/09/27/40-CFR-178.27)). Information submitted in connection with an objection or hearing request may be claimed confidential by marking any part or all of that information as CBI. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2 (/select-citation/2002/09/27/40-CFR-2). A copy of the information that does not contain CBI must be submitted for inclusion in the public record. Information not marked confidential may be disclosed publicly by EPA without prior notice.

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Mail your written request to: Office of the Hearing Clerk (1900), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460. You may also deliver your request to the Office of the Hearing Clerk in Rm. C400, Waterside Mall, 401 M St., SW., Washington, DC 20460. The Office of the Hearing Clerk is open from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Office of the Hearing Clerk is (202) 260-4865.

2. *Tolerance fee payment.* If you file an objection or request a hearing, you must also pay the fee prescribed by 40 CFR 180.33 (/select-citation/2002/09/27/40-CFR-180.33)(i) or request a waiver of that fee pursuant to 40 CFR 180.33 (/select-citation/2002/09/27/40-CFR-180.33)(m). You must mail the fee to: EPA Headquarters Accounting Operations Branch, Office of Pesticide Programs, P.O. Box 360277M, Pittsburgh, PA 15251. Please identify the fee submission by labeling it "Tolerance Petition Fees."

EPA is authorized to waive any fee requirement "when in the judgement of the Administrator such a waiver or refund is equitable and not contrary to the purpose of this subsection." For additional information regarding the waiver of these fees, you may contact James Tompkins by phone at (703) 305-5697, by e-mail at tompkins.jim@epa.gov (<mailto:tompkins.jim@epa.gov>), or by mailing a request for information to Mr. Tompkins at Registration Division (7505C), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

If you would like to request a waiver of the tolerance objection fees, you must mail your request for such a waiver to: James Hollins, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

3. *Copies for the Docket.* In addition to filing an objection or hearing request with the Hearing Clerk as described in Unit VI.A., you should also send a copy of your request to the PIRIB for its inclusion in the official record that is described in Unit I.B.2. Mail your copies, identified by docket ID number OPP-2002-0232, to: Public Information and Records Integrity Branch, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460. In person or by courier, bring a copy to the location of the PIRIB described in Unit I.B.2. You may also send an electronic copy of your request via e-mail to: opp-docket@epa.gov (<mailto:opp-docket@epa.gov>). Please use an ASCII file format and avoid the use of special characters and any form of encryption. Copies of electronic objections and hearing requests will also be accepted on disks in WordPerfect 6.1/8.0 or ASCII file format. Do not include any CBI in your electronic copy. You may also submit an electronic copy of your request at many Federal Depository Libraries.

B. When Will the Agency Grant a Request for a Hearing?

A request for a hearing will be granted if the Administrator determines that the material submitted shows the following: There is a genuine and substantial issue of fact; there is a reasonable possibility that available evidence identified by the requestor would, if established resolve one or more of such issues in favor of the requestor, taking into account uncontested claims or facts to the contrary; and resolution of the factual issues(s) in the manner sought by the requestor would be adequate to justify the action requested (40 CFR 178.32 (/select-citation/2002/09/27/40-CFR-178.32)).

IX. Regulatory Assessment Requirements

This final rule establishes a tolerance under FFDCA section 408(d) in response to a petition submitted to the Agency. The Office of Management and Budget (OMB) has exempted these types of actions from review under Executive Order 12866, entitled *Regulatory Planning and Review* (58 FR 51735, October 4, 1993). Because this rule has been exempted from review under Executive Order 12866 due to its lack of significance, this rule is not subject to Executive Order 13211, (/executive-order/13211) *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use* (66 FR 28355 (/citation/66-FR-28355), May 22, 2001). This final rule does not contain any information collections subject to OMB approval under the Paperwork Reduction Act (PRA), 44 U.S.C. 3501 (<https://api.fdsys.gov/link?collection=uscode&title=44&year=mostrecent§ion=3501&type=usc&link-type=html>) *et seq.*, or impose any enforceable duty or contain any unfunded mandate as described under Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) (Public Law 104-4 (<https://api.fdsys.gov/link?collection=plaw&congress=104&lawtype=public&lawnum=4&link-type=html>)). Nor does it require any special considerations under Executive Order 12898, (/executive-order/12898) entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629, February 16, 1994); or OMB review or any Agency action under Executive Order 13045, (/executive-order/13045) entitled *Protection of Children from Environmental Health Risks and Safety Risks* (62 FR 19885 (/citation/62-FR-19885), April 23, 1997). This action does not involve any technical standards that would require Agency consideration of voluntary consensus standards pursuant to section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113 (<https://api.fdsys.gov/link?collection=plaw&congress=104&lawtype=public&lawnum=113&link-type=html>), section 12(d) (15 U.S.C. 272 (<https://api.fdsys.gov/link?collection=uscode&title=15&year=mostrecent§ion=272&type=usc&link-type=html>) note). Since tolerances and exemptions that are established on the basis of a petition under FFDCA section 408(d), such as the tolerance in this final rule, do not require the issuance of a proposed rule, the requirements of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 (<https://api.fdsys.gov/link?collection=uscode&title=5&year=mostrecent§ion=601&type=usc&link-type=html>) *et seq.*) do not apply. In addition, the Agency has determined that this action will not have a substantial direct effect on States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, (/executive-order/13132) entitled *Federalism* (64 FR 43255 (/citation/64-FR-43255), August 10, 1999). Executive Order 13132 (/executive-order/13132) requires EPA to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.” “Policies that have federalism implications” is defined in the Executive Order to include regulations that have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.” This final rule directly regulates growers, food processors, food handlers and food retailers, not States. This action does not alter the relationships or distribution of power and responsibilities established by Congress in the preemption provisions of FFDCA section 408(n)(4). For these same reasons, the Agency

has determined that this rule does not have any “tribal implications” as described in Executive Order 13175, (/executive-order/13175) entitled *Consultation and Coordination with Indian Tribal Governments* (65 FR 67249 (/citation/65-FR-67249), November 6, 2000). Executive Order 13175, (/executive-order/13175) requires EPA to develop an accountable process to ensure “meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.” “Policies that have tribal implications” is defined in the Executive Order to include regulations that have “substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and the Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.” This rule will not have substantial direct effects on tribal governments, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes, as specified in Executive Order 13175 (/executive-order/13175). Thus, Executive Order 13175 (/executive-order/13175) does not apply to this rule.

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X. Submission to Congress and the Comptroller General

The Congressional Review Act, 5 U.S.C. 801 (<https://api.fdsys.gov/link?collection=uscode&title=5&year=mostrecent§ion=801&type=usc&link-type=html>) *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of this final rule in the **Federal Register**. This final rule is not a “major rule” as defined by 5 U.S.C. 804 (<https://api.fdsys.gov/link?collection=uscode&title=5&year=mostrecent§ion=804&type=usc&link-type=html>)(2).

List of Subjects in 40 CFR Part 180 (/select-citation/2002/09/27/40-CFR-180)

- Environmental protection
- Administrative practice and procedure
- Agricultural commodities
- Pesticides and pests
- Reporting and recordkeeping requirements

Dated: September 18, 2002.

Debra Edwards,

Acting Director, Registration Division, Office of Pesticide Programs.

Therefore, 40 CFR chapter I is amended as follows:

PART 180—[AMENDED]

1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 321 (<https://api.fdsys.gov/link?collection=uscode&title=21&year=mostrecent§ion=321&type=usc&link-type=html>)(q), 346(a) and 371.

Section 180.364 is amended by revising the introductory text of paragraph (a) and alphabetically
2. adding commodities to the table in paragraph (a) to read as follows:

§ 180.364 **Glyphosate; tolerances for residues.**

(a) *General.* Tolerances are established for residues of glyphosate (N-phosphomethyl)glycine) resulting from the application of glyphosate, the isopropylamine salt of glyphosate, the ethanolamine salt of glyphosate, the ammonium salt of glyphosate, and the potassium salt of glyphosate in or on the following food commodities:

Commodity	Parts per million
* * * *	*
Animal feed, nongrass, group	400
* * * *	*
Grass, forage, fodder and hay, group	300
* * * *	*

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[FR Doc. 02-24488 (/a/02-24488) Filed 9-26-02; 8:45 am]

BILLING CODE 6560-50-S

Exhibit 25



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

AUTHENTICATION

I, Delores Barber, attest that I am the Director of the Information Technology and Resources Management Division (ITRMD) of the United States Environmental Protection Agency (EPA or Agency) and that the attached documents are true, correct, and compared copies of the file copies in my legal custody, consisting of:

Document Dated: November 10, 2004

Federal Register, Glyphosate; Pesticide Tolerances Final Rule (16 pages)

Subscribed under the penalty of perjury on this 7th day of June, 2018.

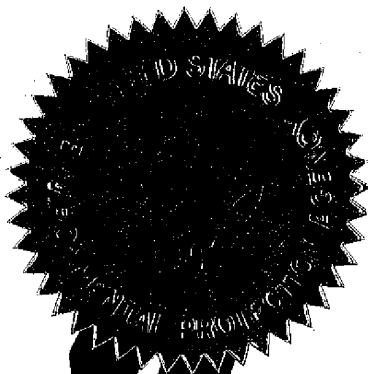
Delores Barber, Director
Information Technology and Resources Management Division (ITRMD)

CERTIFICATION OF TRUE COPY

I, Wendy Blake, certify that I am the Associate General Counsel, General Law Office, Office of General Counsel, of the United States Environmental Protection Agency; that I am the designee of the General Counsel for the purpose of executing certifications under 40 C.F.R. sec. 2.406; that I have duties in Washington, District of Columbia; and that the official whose signature appears above has legal custody pursuant to 40 C.F.R. sec. 2.406 of the original documents, copies of which are attached, as witnessed by my signature and the official seal of the United States Environmental Protection Agency.

Wendy L. Blake
Associate General Counsel
General Law Office
Office of General Counsel

Date: 6/11/18



LEGAL STATUS

LEGAL STATUS

Glyphosate; Pesticide Tolerance

A Rule by the Environmental Protection Agency on 11/10/2004

DOCUMENT DETAILS**Printed version:**

PDF (<https://www.gpo.gov/fdsys/pkg/FR-2004-11-10/pdf/04-25098.pdf>)

Publication Date:

11/10/2004 (/documents/2004/11/10)

Agency:

Environmental Protection Agency (<https://www.federalregister.gov/agencies/environmental-protection-agency>)

Dates:

This regulation is effective November 10, 2004. Objections and requests for hearings must be received on or before January 10, 2005.

Effective Date:

11/10/2004

Document Type:

Rule

Document Citation:

69 FR 65081

Page:

65081-65088 (8 pages)

CFR:

40 CFR 180

Agency/Docket Numbers:

OPP-2004-0323

FRL-7683-9

Document Number:

04-25098

DOCUMENT DETAILS**PUBLISHED DOCUMENT****AGENCY:**

Environmental Protection Agency (EPA).

ACTION:

Final rule.

SUMMARY:

This regulation establishes a tolerance for residues of glyphosate, N-(phosphonomethyl)glycine, resulting from the application of glyphosate, the isopropylamine salt of glyphosate, the ethanolamine salt of glyphosate, the ammonium salt of glyphosate, and the potassium salt of glyphosate in or on cotton, gin byproducts and cotton, undelinted seed. Monsanto Company requested this tolerance under the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (FQPA).

DATES:

This regulation is effective November 10, 2004. Objections and requests for hearings must be received on or before January 10, 2005.

ADDRESSES:

To submit a written objection or hearing request follow the detailed instructions as provided in Unit VII. of the **SUPPLEMENTARY INFORMATION**. EPA has established a docket for this action under Docket identification (ID) number OPP-2004-0323. All documents in the docket are listed in the EDOCKET index at <http://www.epa.gov/edocket/> (<http://www.epa.gov/edocket/>). Although listed in the index, some information is not publicly available, i.e., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in EDOCKET or in hard copy at the Public Information and Records Integrity Branch (PIRIB), Rm. 119, Crystal Mall #2, 1801 South Bell St., Arlington, VA. This docket facility is open from 8:30 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The docket telephone number is (703) 305-5805.

FOR FURTHER INFORMATION CONTACT:

James A. Tompkins, Registration Division (7505C), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460-0001; telephone number: (703) 305-5697; e-mail address: tompkins.jim@epa.gov (<mailto:tompkins.jim@epa.gov>).

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this Action Apply to Me?

You may be potentially affected by this action if you are an agricultural producer, food manufacturer, or pesticide manufacturer. Potentially affected entities may include, but are not limited to:

- Crop production (NAICS 111), e.g., agricultural workers; greenhouse, nursery, and floriculture workers; farmers.
- Animal production (NAICS 112), e.g., cattle ranchers and farmers, dairy cattle farmers, livestock farmers.
- Food manufacturing (NAICS 311), e.g., agricultural workers; farmers; greenhouse, nursery, and floriculture workers; ranchers; pesticide applicators.
- Pesticide manufacturing (NAICS 32532), e.g., agricultural workers; commercial applicators; farmers; greenhouse, nursery, and floriculture workers; residential users.

This listing is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. Other types of entities not listed in this unit could also be affected. The North American Industrial Classification System (NAICS) codes have been provided to assist you and others in

determining whether this action might apply to certain entities. If you have any questions regarding the applicability of this action to a particular entity, consult the person listed under **FOR FURTHER INFORMATION CONTACT**.

B. How Can I Access Electronic Copies of this Document and Other Related Information?

In addition to using EDOCKET (<http://www.epa.gov/edocket/> (<http://www.epa.gov/edocket/>)), you may access this **Federal Register** document electronically through the EPA Internet under the “**Federal Register**” listings at <http://www.epa.gov/fedrgstr/> (<http://www.epa.gov/fedrgstr/>). A frequently updated electronic version of 40 CFR part 180 (/select-citation/2004/11/10/40-CFR-180) is available on E-CFR Beta Site Two at <http://www.gpoaccess.gov/ecfr/> (<http://www.gpoaccess.gov/ecfr/>). To access the OPPTS Harmonized Guidelines referenced in this document, go directly to the guidelines at <http://www.epa.gov/opptsfrs/home/guidelin.htm/> (<http://www.epa.gov/opptsfrs/home/guidelin.htm/>).

II. Background and Statutory Findings

In the **Federal Register** of August 18, 2004 (69 FR 51301 (/citation/69-FR-51301)) (FRL-7364-5), EPA issued a notice pursuant to section 408(d)(3) of FFDCA, 21 U.S.C. 346 (<https://api.fdsys.gov/link?collection=uscode&title=21&year=mostrecent§ion=346&type=usc&link-type=html>)a(d)(3), announcing the filing of pesticide petitions (PP 0F6195, 1F6274, 2F6487, and 3F6570) by Monsanto Company, 600 13th St., NW., Suite 660, Washington, DC 20005. The petition requested that 40 CFR 180.364 (/select-citation/2004/11/10/40-CFR-180.364) be amended by establishing a tolerance for residues of the herbicide glyphosate, N-(phosphonomethyl)glycine, in or on alfalfa seed at 0.5 parts per million (ppm) (PP 2F6487); increasing the current tolerance for cotton, gin byproducts from 100 ppm to 150 ppm (PP 3F6570); rice, bran at 30 ppm; rice, grain at 15 ppm; and rice, hulls at 25 ppm (PP 1F6274); wheat, forage at 10.0 ppm; wheat, hay at 10.0 ppm (PP 0F6195). Monsanto Company also proposed to revise the entry for grain, cereal group tolerance “except rice” to read as grain, cereal group 15 except barley, field corn, grain sorghum, oats, rice, and wheat at 0.1 ppm (PP 1F6274). Monsanto Company also amended PP 0F6195 to delete the proposal for wheat grain at 6 ppm that was announced in the **Federal Register** of April 17, 2002 (67 FR 18894 (/citation/67-FR-18894)) (FRL-6830-5). The notice stated that tolerances for alfalfa, rice, wheat, and cotton gin byproducts include both conventional and genetically altered crops.

The notice also proposed that the tolerances for alfalfa, forage at 175 ppm and alfalfa, hay at 400 ppm be deleted from § 180.364. Also proposed was to amend § 180.364 by replacing the current listing vegetable, legume, group 6 except soybean at 5.0 ppm with the current crop group pea and bean, dried and shelled, subgroup 6C at 5.0 ppm. That notice included a summary of the petition prepared by Monsanto Company, the registrant. One comment was received in response to the notice of filing from B. Sachau, 15 Elm St., Florham Park, NJ 07932. The commenter objected to allowing any tolerance, waiver, or exemption for glyphosate. The commenter also objected to animal testing and stated that a more reliable method of testing should be developed. This comment is discussed further in Unit V.

During the course of the review the Agency decided to correct the company address to read Monsanto Company, 1300 I St., NW., Suite 450 East, Washington, DC 20005. The Agency also determined the tolerance proposed for cotton, gin byproducts should be raised to 175 ppm and that the current tolerance for cotton, undelinted seed be increased to 35 ppm.

The Agency has determined that based on available data, the current tolerances for alfalfa, forage and alfalfa, hay are to be maintained and that the current listing for vegetable, legume, □ group 6 except soybean at 5 ppm is correct; therefore, these proposed changes are not made at this time. Also, even though the proposed

tolerances for alfalfa, seed; rice, bran; rice, grain; rice, hulls; wheat, forage; and wheat, hay are included in the risk assessment discussed in Units III.C., D., and E., these tolerances are not being issued at this time.

The Agency is also correcting the proposed tolerance expression to agree with the current tolerance expression by including references to the salts. Therefore, the tolerance expression is corrected to read: Tolerances are established for residues of glyphosate, N-(phosphonomethyl)glycine, resulting from the application of glyphosate, the isopropylamine salt of glyphosate, the ethanolamine salt of glyphosate, the ammonium salt of glyphosate, and the potassium salt of glyphosate in or on cotton, gin byproducts at 175 ppm and cotton, undelinted seed at 35 ppm.

Section 408(b)(2)(A)(i) of FFDCA allows EPA to establish a tolerance (the legal limit for a pesticide chemical residue in or on a food) only if EPA determines that the tolerance is “safe.” Section 408(b)(2)(A)(ii) of FFDCA defines “safe” to mean that “there is a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposures and all other exposures for which there is reliable information.” This includes exposure through drinking water and in residential settings, but does not include occupational exposure. Section 408(b)(2)(C) of FFDCA requires EPA to give special consideration to exposure of infants and children to the pesticide chemical residue in establishing a tolerance and to “ensure that there is a reasonable certainty that no harm will result to infants and children from aggregate exposure to the pesticide chemical residue....”

EPA performs a number of analyses to determine the risks from aggregate exposure to pesticide residues. For further discussion of the regulatory requirements of section 408 of FFDCA and a complete description of the risk assessment process, see the final rule on Bifenthrin Pesticide Tolerances (62 FR 62961 (/citation/62-FR-62961), November 26, 1997) (FRL-5754-7).

III. Aggregate Risk Assessment and Determination of Safety

Consistent with section 408(b)(2)(D) of FFDCA, EPA has reviewed the available scientific data and other relevant information in support of this action. EPA has sufficient data to assess the hazards of and to make a determination on aggregate exposure, consistent with section 408(b)(2) of FFDCA, for a tolerance for residues of glyphosate, N-(phosphonomethyl)glycine, resulting from the application of glyphosate, the isopropylamine salt of glyphosate, the ethanolamine salt of glyphosate, the ammonium salt of glyphosate, and the potassium salt of glyphosate on cotton, gin byproducts at 175 ppm and cotton, undelinted seed at 35 ppm. EPA's assessment of exposures and risks associated with establishing the tolerance follows.

A. Toxicological Profile

EPA has evaluated the available toxicity data and considered its validity, completeness, and reliability as well as the relationship of the results of the studies to human risk. EPA has also considered available information concerning the variability of the sensitivities of major identifiable subgroups of consumers, including infants and children. The nature of the toxic effects caused by glyphosate as well as the no-observed-adverse-effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL) from the toxicity studies reviewed are discussed in the **Federal Register** of September 27, 2002 (67 FR 60934 (/citation/67-FR-60934)) (FRL-7200-2).

B. Toxicological Endpoints

The dose at which no adverse effects are observed (the NOAEL) from the toxicology study identified as appropriate for use in risk assessment is used to estimate the toxicological level of concern (LOC). However, the lowest dose at which adverse effects of concern are identified (the LOAEL) is sometimes used for risk

assessment if no NOAEL was achieved in the toxicology study selected. An uncertainty factor (UF) is applied to reflect uncertainties inherent in the extrapolation from laboratory animal data to humans and in the variations in sensitivity among members of the human population as well as other unknowns. An UF of 100 is routinely used, 10X to account for interspecies differences and 10X for intraspecies differences.

Three other types of safety or UFs may be used: “Traditional uncertainty factors;” the “special FQPA safety factor;” and the “default FQPA safety factor.” By the term “traditional uncertainty factor,” EPA is referring to those additional UFs used prior to FQPA passage to account for database deficiencies. These traditional uncertainty factors have been incorporated by the FQPA into the additional safety factor for the protection of infants and children. The term “special FQPA safety factor” refers to those safety factors that are deemed necessary for the protection of infants and children, primarily as a result of the FQPA. The “default FQPA safety factor” is the additional 10X safety factor that is mandated by the statute unless it is decided that there are reliable data to choose a different additional factor (potentially a traditional uncertainty factor or a special FQPA safety factor).

For dietary risk assessment (other than cancer) the Agency uses the UF to calculate an acute or chronic reference dose (acute RfD or chronic RfD) where the RfD is equal to the NOAEL divided by an UF of 100 to account for interspecies and intraspecies differences and any traditional uncertainty factors deemed appropriate ($RfD = NOAEL/UF$). Where a special FQPA safety factor or the default FQPA safety factor is used, this additional factor is applied to the RfD by dividing the RfD by such additional factor. The acute or chronic Population Adjusted Dose (aPAD or cPAD) is a modification of the RfD to accommodate this type of safety factor.

For non-dietary risk assessments (other than cancer) the UF is used to determine the LOC. For example, when 100 is the appropriate UF (10X to account for interspecies differences and 10X for intraspecies differences) the LOC is 100. To estimate risk, a ratio of the NOAEL to exposures (margin of exposure (MOE) = $NOAEL/exposure$) is calculated and compared to the LOC.

The linear default risk methodology (Q^*) is the primary method currently used by the Agency to quantify carcinogenic risk. The Q^* approach assumes that any amount of exposure will lead to some degree of cancer risk. A Q^* is calculated and used to estimate risk which represents a probability of occurrence of additional cancer cases (e.g., risk). An example of how such a probability risk is expressed would be to describe the risk as one in one hundred thousand (1×10^{-5}), one in a million (1×10^{-6}), or one in ten million (1×10^{-7}). Under certain specific circumstances, MOE calculations will be used for the carcinogenic risk assessment. In this non-linear approach, a “point of departure” is identified below which carcinogenic effects are not expected. The point of departure is typically a NOAEL based on an endpoint related to cancer effects though it may be a different value derived from the dose response curve. To estimate risk, a ratio of the point of departure to exposure ($MOE_{cancer} = \text{point of departure}/\text{exposures}$) is calculated.

A summary of the toxicological endpoints for glyphosate used for human risk assessment is discussed in Unit V.B. of the final rule published in the **Federal Register** of September 27, 2002 (67 FR 60934 (/citation/67-FR-60934)) (FRL-7200-2).

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C. Exposure Assessment

1. *Dietary exposure from food and feed uses.* Tolerances have been established (40 CFR 180.364 (/select-citation/2004/11/10/40-CFR-180.364)) for the residues of glyphosate, in or on a variety of raw agricultural commodities. Risk assessments were conducted by EPA to assess dietary exposures from glyphosate in food as follows:

i. *Acute exposure.* Acute dietary risk assessments are performed for a food-use pesticide, if a toxicological study has indicated the possibility of an effect of concern occurring as a result of a 1-day or single exposure.

A review of the toxicity database, including developmental toxicity studies in rats and rabbits, did not provide an endpoint that could be used to quantitate risk to the general population and to females 13-50 years old from a single-dose administration of glyphosate. Therefore, no acute dietary analysis was conducted for glyphosate.

ii. *Chronic exposure.* In conducting the chronic dietary risk assessment EPA used the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCIDTM), which incorporates food consumption data as reported by respondents in the USDA 1994-1996 and 1998 Nationwide Continuing Surveys of Food Intake by Individuals (CSFII), and accumulated exposure to the chemical for each commodity. The following assumptions were made for the chronic exposure assessments: Tolerance level residues, DEEM default factors and 100% crop treated. PCT and/or anticipated residues were not used.

iii. *Cancer.* Glyphosate is classified as a Group E chemical, negative for carcinogenicity in humans, based on the absence of carcinogenicity in male and female rats as well as male and female mice.

2. *Dietary exposure from drinking water.* The Agency lacks sufficient monitoring exposure data to complete a comprehensive dietary exposure analysis and risk assessment for glyphosate in drinking water. Because the Agency does not have comprehensive monitoring data, drinking water concentration estimates are made by reliance on simulation or modeling taking into account data on the physical characteristics of glyphosate.

The Agency uses the Generic Estimated Environmental Concentration (GENEEC) or the Pesticide Root Zone Model/Exposure Analysis Modeling System (PRZM/EXAMS) to estimate pesticide concentrations in surface water and Screening Concentration and Ground Water (SCI-GROW) model, which predicts pesticide concentrations in ground water. In general, EPA will use GENEEC (a tier 1 model) before using PRZM/EXAMS (a tier 2 model) for a screening-level assessment for surface water. The GENEEC model is a subset of the PRZM/EXAMS model that uses a specific high-end runoff scenario for pesticides. GENEEC incorporates a farm pond scenario, while PRZM/EXAMS incorporate an index reservoir environment in place of the previous pond scenario. The PRZM/EXAMS model includes a percent crop area factor as an adjustment to account for the maximum percent crop coverage within a watershed or drainage basin.

None of these models include consideration of the impact processing (mixing, dilution, or treatment) of raw water for distribution as drinking water would likely have on the removal of pesticides from the source water. The primary use of these models by the Agency at this stage is to provide a screen for sorting out pesticides for which it is unlikely that drinking water concentrations would exceed human health levels of concern.

Since the models used are considered to be screening tools in the risk assessment process, the Agency does not use estimated environmental concentrations (EECs), which are the model estimates of a pesticide's concentration in water in quantitative risk assessments. EECs derived from these models are used to quantify drinking water exposure and risk as a %RfD or %PAD. Instead drinking water levels of comparison (DWLOCs) are calculated and used as a point of comparison against the model estimates of a pesticide's concentration in water. DWLOCs are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food, and from residential uses. Since DWLOCs address total aggregate exposure to glyphosate they are further discussed in the aggregate risk sections, Unit III.E.

Based on the GENEEC, and SCI-GROW models, the EECs of glyphosate for acute exposures are estimated to be 21.0 parts per billion (ppb) for surface water and 0.0038 ppb for ground water. The EECs for chronic exposures are estimated to be 0.83 ppb for surface water. The EEC resulting from the registered use of direct glyphosate application to surface water is 230 ppb. Because the glyphosate water-application estimate is greater than the crop-application estimate, 230 ppb is the appropriate value to use in the chronic risk assessment. The EEC for chronic exposure in ground water is 0.0038 ppb.

3. *From non-dietary exposure.* The term “residential exposure” is used in this document to refer to non-occupational, non-dietary exposure (e.g., for lawn and garden pest control, indoor pest control, termiticides, and flea and tick control on pets).

i. *Non-occupational (recreational) exposures.* Glyphosate is currently registered for use on the following residential non-dietary sites: Recreational areas, including parks and golf courses for control of broadleaf weeds and grasses, and lakes and pond, including reservoirs for control of nuisance aquatic weeds. Based on the registered uses, adult and child golfers are anticipated to have short-term post-application dermal exposure at golf courses. Swimmers (adults, children, and toddlers) are anticipated to have short-term post-application dermal and incidental ingestion exposures. However, since the Agency did not select dermal endpoints, no post-application dermal assessment was performed.

A post-application incidental ingestion exposure assessment for swimmers was performed. This assessment assumed 100% of applied concentration available at maximum application rate in the top one foot of water column; an ingestion rate of 0.05 Liter/hour (L/hr), and an exposure duration of 5 hrs/day (although a toddler is unlikely to be exposed for 5 hrs/day). Adult and toddler swimmers were included in this assessment as they are anticipated to represent the upper and lower bound of swimmer exposures. The respective body weights are 60 kilogram (kg) for adult-females (since NOAEL is based on developmental study) and 15 kg for toddlers. This exposure assessment is fully discussed in Unit V.C. of the final rule published in the **Federal Register** of September 27, 2002 (67 FR 60934 (/citation/67-FR-60934)) (FRL-7200-2). MOEs for incidental exposure for incidental ingestion by swimmers were 7,600 for toddler and to 36,000 for adult females and therefore, do not exceed the Agency’s level of concern (LOC) for short-term non-occupational (recreational) exposures (MOEs of less than 100).

ii. *Residential exposures.* Glyphosate is also registered for broadcast and spot treatments on home lawns and gardens by homeowners and by lawn care operators (LCOs). Based on the registered residential use pattern, there is a potential for short-term dermal and inhalation exposures to homeowners who apply products containing □ glyphosate (residential handlers). Additionally, based on the results of the environmental fate studies, there is a potential for incidental ingestion by toddlers. However, since the Agency did not select short- or intermediate-term dermal or inhalation endpoints, no residential handler or post-application dermal assessment was performed.

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A post-application toddler assessment for incidental ingestion exposure assessment was performed. The *SOPs For Residential Exposure Assessments*, Draft, 17-DEC-1997 and Exposure Science Advisory Committee (ExpoSAC) Policy No. 11, 22-FEB-2001: *Recommended Revisions to the SOPs for Residential Exposure* were used to estimate post-application incidental ingestion exposures and risk estimates for toddlers. The following assumptions were used to assess exposures to toddlers after contact with treated lawns: Toddler body weight of 15 kg; toddler hand-surface area is 20 centimeter squared (cm)², and a toddler performs 20 hand-to-mouth events per hr for short-term exposures; exposure duration of 2 hrs per day; 5% of application rate represents fraction of glyphosate available for transfer to hands and a 50% saliva extraction factor for hand-to-mouth exposures; surface area of a object (for toddler object-to-mouth exposures; surface area of an

object (for toddler object-to-mouth exposures) is approximately 25 cm²; 20% of application rate available as dislodgeable residues for object-to-mouth exposures; 100% of application rate is available in the top 1 cm of soil for soil ingestion exposures; and that a toddler can ingest 100 milligram (mg) soil/day. This risk assessment is fully discussed in Unit V.C. of the final rule published in the **Federal Register** of September 27, 2002 (67 FR 60934 (/citation/67-FR-60934)) (FRL-7200-2). MOEs for toddler post-application incidental ingestion exposures were 7,200 for hand-to-mouth, 29,000 for object-to-mouth and greater than 10⁶ for soil ingestion, and therefore, do not exceed the Agency's level of concern for residential exposures (MOEs) less than 100.

4. *Cumulative effects from substances with a common mechanism of toxicity.* Section 408(b)(2)(D)(v) of FFDCA requires that, when considering whether to establish, modify, or revoke a tolerance, the Agency consider "available information" concerning the cumulative effects of a particular pesticide's residues and "other substances that have a common mechanism of toxicity."

Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding as to glyphosate and any other substances and glyphosate does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that glyphosate has a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA's OPP concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA's web site at <http://www.epa.gov/pesticides/cumulative/> (<http://www.epa.gov/pesticides/cumulative/>).

D. Safety Factor for Infants and Children

1. *In general.* Section 408 of FFDCA provides that EPA shall apply an additional tenfold margin of safety for infants and children in the case of threshold effects to account for prenatal and postnatal toxicity and the completeness of the database on toxicity and exposure unless EPA determines based on reliable data that a different margin of safety will be safe for infants and children. Margins of safety are incorporated into EPA risk assessments either directly through use of a MOE analysis or through using uncertainty (safety) factors in calculating a dose level that poses no appreciable risk to humans. In applying this provision, EPA either retains the default value of 10X when reliable data do not support the choice of a different factor, or, if reliable data are available, EPA uses a different additional safety factor value based on the use of traditional uncertainty factors and/or special FQPA safety factors, as appropriate.

2. *Prenatal and postnatal sensitivity.* Based on the acceptable developmental studies, the Agency has determined that there is no evidence of either a quantitative or qualitative increased susceptibility following *in utero* glyphosate exposure to rats or rabbits, or following prenatal/postnatal exposure in the 2-generation reproduction study in rats.

3. *Conclusion.* There is a complete toxicity database for glyphosate and exposure data are complete or are estimated based on data that reasonably accounts for potential exposures. The impact of glyphosate on the nervous system has not been specifically evaluated in neurotoxicity studies. However, there was no evidence of neurotoxicity seen in either acute, subchronic, chronic, or reproductive studies. and there are no concerns for potential developmental neurotoxicity. Therefore, neurotoxicity studies are not required for glyphosate. EPA determined that the 10X SF to protect infants and children should be removed. The FQPA factor is removed because the toxicology database is complete; a developmental neurotoxicity study is not required;

there is no evidence of quantitative or qualitative increased susceptibility of the young demonstrated in the prenatal developmental studies in rats or rabbits and pre-/postnatal reproduction study in rats; and the dietary (food and drinking water) exposure assessments will not underestimate the potential exposure for infants and children.

E. Aggregate Risks and Determination of Safety

To estimate total aggregate exposure to a pesticide from food, drinking water, and residential uses, the Agency calculates DWLOCs which are used as a point of comparison against EECs. DWLOC values are not regulatory standards for drinking water. DWLOCs are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food and residential uses. In calculating a DWLOC, the Agency determines how much of the acceptable exposure (i.e., the PAD) is available for exposure through drinking water [e.g., allowable chronic water exposure (mg/kg/day) = cPAD - (average food + residential exposure)]. This allowable exposure through drinking water is used to calculate a DWLOC.

A DWLOC will vary depending on the toxic endpoint, drinking water consumption, and body weights. Default body weights and consumption values as used by the EPA's Office of Water are used to calculate DWLOCs: 2 L/70 kg (adult male), 2L/60 kg (adult female), and 1L/10 kg (child). Default body weights and drinking water consumption values vary on an individual basis. This variation will be taken into account in more refined screening-level and quantitative drinking water exposure assessments. Different populations will have different DWLOCs. Generally, a DWLOC is calculated for each type of risk assessment used: Acute, short-term, intermediate-term, chronic, and cancer.

When EECs for surface water and ground water are less than the calculated DWLOCs, OPP concludes with reasonable certainty that exposures to the pesticide in drinking water (when considered along with other sources of □ exposure for which OPP has reliable data) would not result in unacceptable levels of aggregate human health risk at this time. Because OPP considers the aggregate risk resulting from multiple exposure pathways associated with a pesticide's uses, levels of comparison in drinking water may vary as those uses change. If new uses are added in the future, OPP will reassess the potential impacts of residues of the pesticide in drinking water as a part of the aggregate risk assessment process.

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1. *Acute risk.* Glyphosate is not expected to pose an acute risk because no toxicological endpoints attributable to a single exposure (dose), including maternal toxicity in developmental toxicity studies, were identified in the available data.

2. *Chronic risk.* Using the exposure assumptions described in this unit for chronic exposure, EPA has concluded that exposure to glyphosate from food will utilize 2.2% of the cPAD for the U.S. population, 3.9% of the cPAD for all infants < 1 year old, and 5.4% of the cPAD for children 1-2 years old. Based the use pattern, chronic residential exposure to residues of glyphosate is not expected. In addition, there is potential for chronic dietary exposure to glyphosate in drinking water. After calculating DWLOCs and comparing them to the EECs for surface and ground water, EPA does not expect the aggregate exposure to exceed 100% of the cPAD, as shown in Table 1 of this unit:

Table 1.—Aggregate Risk Assessment for Chronic (Non-Cancer) Exposure to Glyphosate

Population subgroup	cPAD mg/kg/day	%cPAD (Food)	Surface Water EEC (ppb)	Ground Water EEC (ppb)	Chronic DWLOC (ppb)
U.S. Population	1.75	2.2	230	0.0038	60,000
All infants < 1 year old	1.75	3.9	230	0.0038	16,800
Children 1-2 years old	1.75	5.4	230	0.0038	16,600
Females 13-49 years old	1.75	1.7	230	0.0038	51,600
Youth 13-19 years old	1.75	2.1	230	0.0038	51,400
Adults 20-49 years old	1.75	1.9	230	0.0038	60,100

3. *Short-term risk.* Short-term aggregate exposure takes into account residential exposure plus chronic exposure to food and water (considered to be a background exposure level).

Glyphosate is currently registered for use that could result in short-term residential exposure and the Agency has determined that it is appropriate to aggregate chronic food and water and short-term exposures for glyphosate.

Using the exposure assumptions described in this unit for short-term exposures, EPA has concluded that food and residential exposures aggregated result in aggregate MOEs of 1,800 for all infants < 1 year old, 1,500 for children 1-6 years old, and 2000 for children 7-12 years old. Because the incidental oral ingestion exposure estimates for toddlers from residential turf exposures exceeded the incidental oral exposure from post-application swimmer exposures, the Agency conducted this risk assessment using exposure estimates from the worst case situation. No attempt was made to combine exposures from swimmer and residential turf scenarios due to the low probability of both occurring. See Tables 5 and 6 from the final rule published in the **Federal Register** of September 27, 2002 (67 FR 60934 (/citation/67-FR-60934)) (FRL-7200-2) for detailed discussion. These aggregate MOEs do not exceed the Agency's level of concern for aggregate exposure to food and residential uses. In addition, short-term DWLOCs were calculated and compared to the EECs for chronic exposure of glyphosate in ground and surface water. After calculating DWLOCs and comparing them to the EECs for surface and ground water, EPA does not expect short-term aggregate exposure to exceed the Agency's level of concern, as shown in Table 2 of this unit:

Table 2.—Aggregate Risk Assessment for Short-Term Exposure to Glyphosate

Population subgroup	Aggregate MOE (Food + Residential)	Aggregate Level of Concern (LOC)	Surface Water EEC (ppb)	Ground Water EEC (ppb)	Short-Term DWLOC (ppb)
All infants < 1 year old	1,800	100	230	0.0038	16,500
Children 1-6 years old	1,500	100	230	0.0038	16,300
Children 7-12 years old	2,000	100	230	0.0038	16,600

4. *Intermediate-term risk.* Intermediate-term aggregate exposure takes into account residential exposure plus chronic exposure to food and water (considered to be a background exposure level).

Glyphosate is currently registered for use(s) that could result in intermediate-term residential exposure and the Agency has determined that it is appropriate to aggregate chronic food and water and intermediate-term exposures for glyphosate.

Using the exposure assumptions described in this unit for intermediate-term exposures, EPA has concluded that food and residential exposures aggregated result in aggregate MOEs of 1,800 for all infants < 1 year old, 1,500 for children 1-6 years old, and 2,000 for □ children 7-12 years old. Because the incidental oral ingestion exposure estimates for toddlers from residential turf exposures exceeded the incidental oral exposure from post-application swimmer exposures, the Agency conducted this risk assessment using exposure estimates from the worst case situation. No attempt was made to combine exposures from swimmer and residential turf scenarios due to the low probability of both occurring. See Tables 5 and 6 from the final rule published in the **Federal Register** of September 27, 2002 (67 FR 60934 (/citation/67-FR-60934)) (FRL-7200-2) for detailed discussion. These aggregate MOEs do not exceed the Agency's level of concern for aggregate exposure to food and residential uses. In addition, intermediate-term DWLOCs were calculated and compared to the EECs for chronic exposure of glyphosate in ground and surface water. After calculating DWLOCs and comparing them to the EECs for surface and ground water, EPA does not expect intermediate-term aggregate exposure to exceed the Agency's level of concern, as shown in Table 3 of this unit:

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Table 3.—Aggregate Risk Assessment for Intermediate-Term Exposure to Glyphosate

Population subgroup	Aggregate MOE (Food + Residential)	Aggregate Level of Concern (LOC)	Surface Water EEC (ppb)	Ground Water EEC (ppb)	Intermediate-Term DWLOC (ppb)
All infants < 1 year old	1,800	100	230	0.0038	16,500
Children 1-6 years old	1,500	100	230	0.0038	16,300
Children 7-12 years old	2,000	100	230	0.0038	16,600

5. *Aggregate cancer risk for U.S. population.* Glyphosate has no carcinogenic potential.

6. *Determination of safety.* Based on these risk assessments, EPA concludes that there is a reasonable certainty that no harm will result to the general population, and to infants and children from aggregate exposure to glyphosate residues.

IV. Other Considerations

A. Analytical Enforcement Methodology

Adequate analytical methods are available for the enforcement of tolerances for glyphosate in plant and livestock commodities. These methods include gas liquid chromatography (GLC) (*Method I in Pesticides Analytical Manual* (PAM II)) and High Performance Liquid Chromatography (HPLC) with fluorometric detection. Use of GLC is discouraged due to the lengthiness of the experimental procedure. The HPLC procedure has undergone successful Agency validation and was recommended for inclusion into PAM II. A Gas Chromatography Spectrometry (GC/MS) method for glyphosate in crops has also been validated by EPA.

These methods may be requested from: Chief, Analytical Chemistry Branch, Environmental Science Center, 701 Mapes Rd., Ft. Meade, MD 20755-5350; telephone number: (410) 305-2905; e-mail address: residuemethods@epa.gov (<mailto:residuemethods@epa.gov>).

B. International Residue Limits

Codex and Mexican maximum residue levels (MRLs) are established for residues of glyphosate per se and Canadian MRLs are established for combined residues of glyphosate and aminomethylphosphonic acid (AMPA) in a variety of raw agricultural commodities. Codex MRLs exist for dry peas and dry beans at 5 ppm and 2 ppm, respectively. Canadian MRLs exist for peas, beans, and lentils at 5 ppm, 2 ppm, and 4 ppm, respectively. Mexican MRLs of 0.2 ppm exist for both peas and beans. Codex and Canadian MRLs for beans and lentils, and Mexican MRLs for peas and beans are lower than necessary to cover residues from the use patterns in the United States. The proposed U. S. tolerance for the crop group peas and beans, dried and shelled, except soybeans, is in agreement with the Codex and Canadian MRLs for dry peas and beans, respectively, and are necessary to cover use patterns in the United States.

Currently no Codex MRL for cotton, gin byproducts or cotton, undelinted seed are established.

C. Conditions

There are no conditions of registration for the establishment of tolerances on cotton, gin byproducts or cotton, undelinted seed.

V. Comments

One comment was received in response to the notice of filing from B. Sachau, 15 Elm St., Florham Park, NJ 07932. The commenter objected to the allowance of any tolerances, waiver, or exemption from tolerance for glyphosate because there are bad effects from glyphosate. The commenter also objected to animal testing, because testing on rabbit or dog constitutes animal abuse, and stated that a more reliable method of testing should be developed.

The comment contained no scientific data or evidence to rebut the Agency's conclusion that there is a reasonable certainty that no harm will result from aggregate exposure to glyphosate, including all anticipated dietary exposure and all other exposures for which there is reliable information.

Health Effects Guidelines (Series 870) recommends that dog or rabbit be used for various acute, subchronic, and longer term chronic, carcinogenic, developmental, and reproductive studies. Information derived from these tests serve to indicate the presence of possible hazards likely to arise from exposure to the test substance. Currently, there are not *in vitro* studies that can address the questions these studies answer. The EPA is currently working with the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) to investigate alternative *in vitro* methods.

VI. Conclusion

Therefore, the tolerance is established for residues of glyphosate, N-(phosphonomethyl)glycine, resulting from the application of glyphosate, the isopropylamine salt of glyphosate, the ethanolamine salt of glyphosate, the ammonium salt of glyphosate, and the potassium salt of glyphosate in or on cotton, gin byproducts at 175 ppm and cotton, undelinted seed at 35 ppm.

VII. Objections and Hearing Requests

Under section 408(g) of FFDCA, as amended by FQPA, any person may file an objection to any aspect of this regulation and may also request a hearing on those objections. The EPA's procedural regulations which govern the submission of objections and requests for hearings appear in 40 CFR part 178 (/select-citation/2004/11/10/40-CFR-178). Although the procedures in those regulations require some modification to reflect the amendments made to FFDCA by FQPA, EPA will continue to use those procedures, with appropriate adjustments, until the necessary modifications can be made. The new section 408(g) of FFDCA provides essentially the same process for persons to "object" to a regulation for an exemption from the requirement of a tolerance issued by EPA under new section 408(d) of FFDCA, as was provided in the old sections 408 and 409 of FFDCA. However, the period for filing objections is now 60 days, rather than 30 days.

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A. What Do I Need to Do to File an Objection or Request a Hearing?

You must file your objection or request a hearing on this regulation in accordance with the instructions provided in this unit and in 40 CFR part 178 (/select-citation/2004/11/10/40-CFR-178). To ensure proper receipt by EPA, you must identify docket ID number OPP-2004-0323 in the subject line on the first page of your submission. All requests must be in writing, and must be mailed or delivered to the Hearing Clerk on or before January 10, 2005.

1. *Filing the request.* Your objection must specify the specific provisions in the regulation that you object to, and the grounds for the objections (40 CFR 178.25 (/select-citation/2004/11/10/40-CFR-178.25)). If a hearing is requested, the objections must include a statement of the factual issue(s) on which a hearing is requested, the requestor's contentions on such issues, and a summary of any evidence relied upon by the objector (40 CFR 178.27 (/select-citation/2004/11/10/40-CFR-178.27)). Information submitted in connection with an objection or hearing request may be claimed confidential by marking any part or all of that information as CBI. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2 (/select-citation/2004/11/10/40-CFR-2). A copy of the information that does not contain CBI must be submitted for inclusion in the public record. Information not marked confidential may be disclosed publicly by EPA without prior notice.

Mail your written request to: Office of the Hearing Clerk (1900L), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460-0001. You may also deliver your request to the Office of the Hearing Clerk in Suite 350, 1099 14th St., NW., Washington, DC 20005. The Office of the Hearing Clerk is

open from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Office of the Hearing Clerk is (202) 564-6255.

2. *Copies for the Docket.* In addition to filing an objection or hearing request with the Hearing Clerk as described in Unit VII.A., you should also send a copy of your request to the PIRIB for its inclusion in the official record that is described in **ADDRESSES**. Mail your copies, identified by docket ID number OPP-2004-0323, to: Public Information and Records Integrity Branch, Information Resources and Services Division (7502C), Office of Pesticide Programs, Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460-0001. In person or by courier, bring a copy to the location of the PIRIB described in **ADDRESSES**. You may also send an electronic copy of your request via e-mail to: opp-docket@epa.gov (<mailto:opp-docket@epa.gov>). Please use an ASCII file format and avoid the use of special characters and any form of encryption. Copies of electronic objections and hearing requests will also be accepted on disks in WordPerfect 6.1/8.0 or ASCII file format. Do not include any CBI in your electronic copy. You may also submit an electronic copy of your request at many Federal Depository Libraries.

B. When Will the Agency Grant a Request for a Hearing?

A request for a hearing will be granted if the Administrator determines that the material submitted shows the following: There is a genuine and substantial issue of fact; there is a reasonable possibility that available evidence identified by the requestor would, if established resolve one or more of such issues in favor of the requestor, taking into account uncontested claims or facts to the contrary; and resolution of the factual issue(s) in the manner sought by the requestor would be adequate to justify the action requested (40 CFR 178.32 (/select-citation/2004/11/10/40-CFR-178.32)).

VIII. Statutory and Executive Order Reviews

This final rule establishes a tolerance under section 408(d) of FFDCA in response to a petition submitted to the Agency. The Office of Management and Budget (OMB) has exempted these types of actions from review under Executive Order 12866, entitled *Regulatory Planning and Review* (58 FR 51735, October 4, 1993). Because this rule has been exempted from review under Executive Order 12866 due to its lack of significance, this rule is not subject to Executive Order 13211, (/executive-order/13211) *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use* (66 FR 28355 (/citation/66-FR-28355), May 22, 2001). This final rule does not contain any information collections subject to OMB approval under the Paperwork Reduction Act (PRA), 44 U.S.C. 3501 (<https://api.fdsys.gov/link?collection=uscode&title=44&year=mostrecent§ion=3501&type=usc&link-type=html>) *et seq.*, or impose any enforceable duty or contain any unfunded mandate as described under Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) (Public Law 104-4 (<https://api.fdsys.gov/link?collection=plaw&congress=104&lawtype=public&lawnum=4&link-type=html>)). Nor does it require any special considerations under Executive Order 12898, (/executive-order/12898) entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629, February 16, 1994); or OMB review or any Agency action under Executive Order 13045, (/executive-order/13045) entitled *Protection of Children from Environmental Health Risks and Safety Risks* (62 FR 19885 (/citation/62-FR-19885), April 23, 1997). This action does not involve any technical standards that would require Agency consideration of voluntary consensus standards pursuant to section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113 (<https://api.fdsys.gov/link?collection=plaw&congress=104&lawtype=public&lawnum=113&link-type=html>), section 12(d) (15 U.S.C. 272 (<https://api.fdsys.gov/link?collection=uscode&title=15&year=mostrecent§ion=272&type=usc&link-type=html>) note). Since tolerances and exemptions that are established on the basis of a petition under section 408(d) of FFDCA,

such as the tolerance in this final rule, do not require the issuance of a proposed rule, the requirements of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 (<https://api.fdsys.gov/link?collection=uscode&title=5&year=mostrecent§ion=601&type=usc&link-type=html>) *et seq.*) do not apply. In addition, the Agency has determined that this action will not have a substantial direct effect on States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132, (</executive-order/13132>) entitled *Federalism* (64 FR 43255 (</citation/64-FR-43255>), August 10, 1999). Executive Order 13132 (</executive-order/13132>) requires EPA to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.” “Policies that have federalism implications” is defined in the Executive order to include regulations that have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.” This final rule directly regulates growers, food processors, food handlers, and food retailers, not States. This action does not alter the relationships or distribution of power and responsibilities established by Congress in the preemption provisions of section 408(n)(4) of FFDCA. For these same reasons, the Agency has determined that this rule ☐ does not have any “tribal implications” as described in Executive Order 13175, (</executive-order/13175>) entitled *Consultation and Coordination with Indian Tribal Governments* (65 FR 67249 (</citation/65-FR-67249>), November 6, 2000). Executive Order 13175, (</executive-order/13175>) requires EPA to develop an accountable process to ensure “meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.” “Policies that have tribal implications” is defined in the Executive order to include regulations that have “substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and the Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.” This rule will not have substantial direct effects on tribal governments, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes, as specified in Executive Order 13175 (</executive-order/13175>). Thus, Executive Order 13175 (</executive-order/13175>) does not apply to this rule.

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IX. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 (<https://api.fdsys.gov/link?collection=uscode&title=5&year=mostrecent§ion=801&type=usc&link-type=html>) *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of this final rule in the **Federal Register**. This final rule is not a “major rule” as defined by 5 U.S.C. 804 (<https://api.fdsys.gov/link?collection=uscode&title=5&year=mostrecent§ion=804&type=usc&link-type=html>)(2).

List of Subjects in 40 CFR Part 180 (</select-citation/2004/11/10/40-CFR-180>)

- Environmental protection
- Administrative practice and procedure
- Agricultural commodities
- Pesticides and pests
- Reporting and recordkeeping requirements

Dated: October 25, 2004.

Betty Shackelford,

Acting Director, Registration Division, Office of Pesticide Programs.

Therefore, 40 CFR chapter I is amended as follows:

PART 180—AMENDED

1. The authority citation for part 180 continues to read as follows:

Authority: 21 U.S.C. 321 ([\(https://api.fdsys.gov/link?collection=uscode&title=21&year=mostrecent§ion=321&type=usc&link-type=html\)](https://api.fdsys.gov/link?collection=uscode&title=21&year=mostrecent§ion=321&type=usc&link-type=html))(q), 346a and 371.

2. Section 180.364, paragraph (a) is amended by:

- i. Revising the chemical name “(N-phosphomethyl)glycine)” in the introductory text to read “N-(phosphonomethyl)glycine.”
- ii. Revising in the table the entries “cotton, gin byproducts” and “cotton, undelinted seed” to read as follows:

§ 180.364 Glyphosate; tolerances for residues.
(a) * * *

Commodity	Parts per million
* * *	* *
Cotton, gin byproducts	175
Cotton, undelinted seed	35
* * *	* *

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[FR Doc. 04-25098 (/a/04-25098) Filed 11-9-04; 8:45 am]

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