

PERENNIAL WEEDS - HORSERADISH

General Information

GENERAL INFORMATION

Product Description: This product is a postemergence, systemic herbicide with no soil residual activity. It is generally non-selective and gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid. It may be applied through most standard industrial or field sprayers after dilution and thorough mixing with water or other carriers according to label instructions.

Do not add buffering agents or pH adjusting agents to the spray solution when RT 3 Powered by Roundup Technology Herbicide is the only pesticide being applied unless otherwise directed. See the "MIXING" section of the label for instructions regarding other additives.

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 that 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. Refer to the "ANNUAL WEEDS RATE SECTION" and "PERENNIAL WEEDS RATE SECTION" for more information on specific weeds.

Always use the higher product application rate within a given range when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area.

Reduced weed control may result when treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions.

Cultural Considerations: Reduced control may result when application is made to annual or perennial weeds that have been mowed, grazed or cut, and have not been allowed to re-grow to the specified stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash this product off of the foliage and a repeat application may be required for adequate weed control.

Spray Coverage: For best results, spray coverage should be uniform and complete. Do not spray foliage to the point of run-off.

Mode of Action: 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.

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 root stocks of perennials that have not yet emerged at the time of application will not be affected by this herbicide and will continue to grow.

Biological Degradation: Degradation of this product is primarily a biological process carried out by soil microbes.

Maximum Application Rates: The maximum application or use rates stated throughout the 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. See the "INGREDIENTS" section of the label for necessary product information.

Except as otherwise specified in a crop section of the label, the combined total of all treatments must not exceed 5.3 quarts of this product (6 pounds of glyphosate acid) per acre per year. For applications in non-crop sites the combined total of all treatments must not exceed 7 quarts of this product (8 pounds of glyphosate acid)

per acre per year.

NOTE: Use of this product in any manner not consistent with the label may result in injury to persons, animals or crops, or have other unintended consequences.

WEED RESISTANCE MANAGEMENT

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 by using other cultural or mechanical practices.

General Weed Management

To minimize the occurrence of glyphosate-resistant biotypes, observe the following general weed management practices:

- Scout your fields before and after herbicide application.
- Start with a clean field, using either a burndown herbicide application or tillage.
- Control weeds early when they are relatively small.
- Add other herbicides (e.g. a selective and/or a residual herbicide) and cultural practices (e.g. tillage or crop rotation) where appropriate.
- Use the application rate for the most difficult to control weed in your field. Avoid tank mixtures with other herbicides that reduce this product's efficacy (through antagonism), or with ones that encourage application rates of this product below those specified on the label.
- Control weed escapes and prevent weeds from setting seeds.
- Clean equipment before moving from field to field to minimize the spread of weed seed or plant parts.
- Use new commercial seed that is 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.

Management of Glyphosate-Resistant Biotypes

NOTE: Appropriate testing is critical in order to determine if a weed is resistant 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. For more information see the “ANNUAL WEEDS RATE SECTION” and “PERENNIAL WEEDS RATE SECTION” of the label.

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 can 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 agronomic practices can reduce the spread of confirmed glyphosate-resistant biotypes:

- If a naturally occurring resistant biotype is present in your field, this product should 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 (e.g. crop rotation or tillage) may also be used as appropriate.
- One method for adding other herbicides into a continuous Roundup Ready system is to rotate to other Roundup Ready crops.
- Scout treated fields after herbicide applications and control weed escapes, including resistant biotypes before they set seed.

- Thoroughly clean equipment before leaving fields known to contain resistant biotypes.

Mixing with Water

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 required amount of this product near the end of the filling process and mix gently. During mixing, foaming of the spray solution may occur. To prevent or minimize foaming, mix gently, terminate bypass and return lines at the bottom of the tank, and, if necessary, use an anti-foam or defoaming agent.

APPLICATION EQUIPMENT AND TECHNIQUES

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

This product may be applied with the following application equipment:

Aerial-Fixed-wing and helicopter

Ground Broadcast Spray-Boom or boomless systems, pull-type sprayers, floaters, pick-up sprayers, spray coupes and other ground broadcast equipment

Hand-Held or Backpack Equipment-Backpack sprayers, pump-up pressure sprayers, handguns, handwands, mistblowers, lances and other hand-held and motorized spray equipment used to direct the spray onto weed foliage

Selective Equipment-Shielded and hooded sprayers, wiper applicators and sponge bars

Injection Systems-Aerial or ground injection sprayers

Controlled Droplet Applicator (CDA)-Hand-held or boom-mounted applicators that produce a spray consisting of a narrow range of droplet sizes

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

Aerial Equipment

All treatments described on the label may be made using aerial application

equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on the label and in separate supplemental labeling published by Monsanto for this product.

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS SPECIFIED ON THE LABEL.

Apply this herbicide at the appropriate rate as directed on the label in 3 to 15 gallons of water per acre unless otherwise directed on the label, or in separate supplemental labeling or Fact Sheets published by Monsanto for this product. Unless otherwise specified, do not exceed 44 fluid ounces of this product per acre when using aerial application equipment. Refer to the individual use area sections of the label for application rates, spray volumes, and additional use instructions.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

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.

Ground Broadcast Equipment

Apply this product at the appropriate rate in 3 to 40 gallons of water per acre when making broadcast applications using ground application equipment, unless otherwise directed on the label or in separate supplemental labeling or Fact Sheets published by Monsanto for this product. As the weed density increases, the spray volume should be increased towards the upper end of this range to ensure complete coverage. Carefully select proper nozzles to avoid generating a fine mist. For best results with ground application equipment, use flat spray nozzles. Check spray pattern for uniform distribution.

Hand-Held or Backpack Equipment

Apply to foliage of vegetation to be controlled. Spray coverage should be uniform and complete. Use coarse sprays only. For applications made on a spray-to-wet basis, do not spray to the point of runoff. For appropriate rates of application and timing, refer to the "ANNUAL WEEDS-HAND-HELD OR BACKPACK EQUIPMENT" section of this product label.

Selective Equipment

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

In cropping systems, shielded sprayers, hooded sprayers, and wiper applicators may be used in-between rows of crop plants (row middles). Wiper applicators may be used over the top of crops only when specifically allowed on the label. Selective equipment must be capable of preventing all contact of the herbicide solution with the crop and operated without spray mist escape or leakage, or dripping of the herbicide solution onto the crop.

AVOID CONTACT OF THIS HERBICIDE WITH DESIRABLE VEGETATION.

Contact of this product with desirable vegetation may result in unwanted plant damage or destruction.

Shielded and Hooded Sprayers

This product, when applied at rates specified on the label using shielded and hooded sprayers according to the directions described in this section, will control those weeds listed in the "ANNUAL WEEDS RATE SECTION" and "PERENNIAL WEEDS RATE SECTION" of the label.

A hooded sprayer is a type of shielded sprayer where the spray pattern is fully enclosed, including the top, sides, front and back, thereby shielding the crop from the spray solution. Adjust the shields on these sprayers to protect desirable vegetation. When applying around crops grown on raised beds, ensure that the hood is capable of completely enclosing the spray pattern. If necessary, extend the front and rear flaps of the hooded sprayer downward to reach the ground in deep furrows. USE EXTREME CARE TO AVOID CONTACT OF THIS HERBICIDE WITH DESIRABLE VEGETATION.

Hooded sprayers must be configured and operated in a manner that minimizes bouncing and avoids raising the hood up off the ground surface at any time. If the hood is raised, spray particles may escape and come into contact with the crop, causing damage to or destruction of the crop. Avoid operating this equipment on rough or sloping terrain where the spray hood might be raised up off the ground surface.

Use hoods designed to minimize excessive dripping or run-off down the insides of the hoods. A single, low pressure, low-drift, flat-fan nozzle with an 80 to 95 degree spray angle positioned at the top center of the hood is recommended. Spray volume when using hooded sprayers should be 20 to 30 gallons per acre.

The following procedures will reduce the potential for crop injury when using hooded sprayers:

- Spray hoods must be operated on the ground or skimming across the ground surface.
- Leave at least an 8-inch untreated strip over the drill row. (For example, if the crop row width is 38 inches, the maximum width of the spray hood should be 30 inches.)
- Operate at ground speeds of no greater than 5 miles per hour to avoid bouncing of the spray hoods.
- Apply when wind speeds are 10 miles per hour or less.
- Use low-drift nozzles that provide uniform coverage within the treated area.

Crop injury may occur when foliage of treated weeds comes into direct contact with leaves of the crop. Do not apply this product when crop leaves are growing in direct

contact with weeds to be treated. Droplets, mist, foam or splatter of the herbicide solution settling onto desirable vegetation may result in discoloration, stunting or destruction.

Wiper Applicators

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

Wiper applicators 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 a ground speed of 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 promptly after using this product by thoroughly flushing with water.

Do not add surfactant to the herbicide solution when using a wiper applicator.

For Rope or Sponge Wick Applicators—Use solutions ranging from 33 to 75 percent of

this product in water.

For Panel Applicators—Use solutions ranging from 33 to 100 percent of this product in water.

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 concentrate of other products for use in injection systems.

CDA Equipment

The rate of this product applied per acre by vehicle-mounted controlled droplet applicator (CDA) equipment must not be less than the amount specified on the label for conventional broadcast application. For vehicle-mounted CDA equipment, apply in 2 to 15 gallons of water per acre.

For control of annual weeds with hand-held CDA units, apply a 20-percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 1.5 miles per hour (1 quart per acre). For the control of perennial weeds, apply a 20- to 30-percent solution of this product at a flow rate of 2 fluid ounces per minute and a walking speed of 0.75 mile per hour (2 to 3 quarts per acre).

Controlled droplet applicators produce a spray pattern that is not easily visible. Extreme care must be taken to avoid spray or drift from contacting the foliage or any other green tissue of desirable vegetation, as damage or destruction of the plant may result.

ANNUAL AND PERENNIAL CROPS

NOTE: THIS SECTION GIVES GENERAL DIRECTIONS THAT APPLY TO ALL CROPS LISTED ALPHABETICALLY IN THE SECTIONS THAT FOLLOW. SEE THE INDIVIDUAL CROP SECTIONS FOR SPECIFIC USE INSTRUCTIONS, PREHARVEST INTERVALS, AND ADDITIONAL PRECAUTIONS AND RESTRICTIONS.

TYPES OF APPLICATION: Chemical Fallow, Preplant Fallow Beds, Preplant, At-Planting, Preemergence, Hooded Sprayer in Row Middles, Shielded Sprayer in Row Middles, Wiper Application in Row Middles, Post-Harvest

GENERAL USE INSTRUCTIONS: Apply this product during fallow intervals preceding planting, prior to planting or transplanting, at-planting, or preemergence to annual and perennial crops listed in the label, except where specifically limited. For any crop not listed on the label, application must be made at least 30 days prior to planting. Unless otherwise specified, apply this product according to the rates listed in the “ANNUAL WEEDS RATE SECTION” and “PERENNIAL WEEDS RATE SECTION” of the label. Application rates specified on the label for the control of tough weeds, or those specified on separate supplemental labeling for this product, supersede the rates in the “ANNUAL WEEDS RATE SECTION” and “PERENNIAL WEEDS RATE SECTION” of the label. Additional information on the control of tough weeds can be found in Fact Sheets published by Monsanto for this product.

Repeat applications may be made up to a maximum of 5.3 quarts of this product per acre per year.

Hooded sprayers and wiper applicators capable of preventing all crop contact with the herbicide solution may be used in mulched or unmulched row middles after crop establishment. Wiper applicators may be used over the top of crops to control tall weeds, only when specifically directed in the individual crop sections that follow. Refer to the “SELECTIVE EQUIPMENT” section of the label for essential precautions regarding crop injury. Crop injury is possible with these types of application, and shall be the sole responsibility of the applicator.

All treatments described in the sections that follow may be made by aerial equipment where appropriate, provided that the applicator complies with the precautions and restrictions specified on the label and on separate supplemental labeling published by Monsanto for this product. Refer to the “AERIAL EQUIPMENT” section of the label for additional information.

TANK MIXTURES: 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 all products according to rates specified on the label. Some tank-mix products have the potential to cause crop injury under certain conditions, at certain crop

growth stage and/or under other circumstances. Read all labels for products used in the tank mixture prior to use to determine the potential for crop injury. Always predetermine the compatibility of tank-mix products together in the carrier by mixing small proportional quantities in advance. A tank mixture of this product with other herbicides may cause incompatibility, antagonism, or a reduction in the efficacy of this product. Monsanto has not tested all tank-mix product formulations for compatibility or performance. See the "MIXING" section of the label for more information on tank mixtures.

GENERAL PRECAUTIONS, RESTRICTIONS: Avoid contact of this herbicide with foliage, green shoots or stems, bark, exposed roots (including those emerging from plastic mulch), or fruit of crops, as severe crop injury or destruction may result. When making at-planting and preemergence applications, application must be made before crop emergence to avoid severe crop injury. Broadcast application made at emergence will result in injury or death of emerged seedlings. Apply before seed germination in coarse sandy soils to further minimize the risk of injury. Unless otherwise specified on the label, treatments with selective equipment, including wiper applicators and hooded sprayers, must be made at least 14 days prior to harvest. Post-harvest and fallow applications must be made at least 30 days prior to planting any crop not listed on the label. See "APPLICATION EQUIPMENT AND TECHNIQUES" section of the label for additional information.

In crops where spot treatment is allowed, do not treat more than 10 percent of the total field to be harvested. The crop receiving spray 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 crop destruction.

Do not harvest or feed treated vegetation for 8 weeks following broadcast postemergence application, unless otherwise specified.

Observe the maximum application rates stated throughout the label. Maximum application rates apply to the use of this product combined with the use of any and all other herbicides containing glyphosate as the active ingredient, whether applied separately or as mixtures. Calculate the application rates (glyphosate acid equivalents) and ensure that the total use of this and other glyphosate-containing products does not exceed the stated maximum rate. See the "GENERAL INFORMATION" section of the label for more information on Maximum Application Rates.

Refer in the label regarding tank mix information.

Limitations, Restrictions, and Exceptions

PERENNIAL WEEDS

Apply to actively growing perennial weeds.

NOTE: If weeds have been mowed or tilled, do not treat until plants have resumed active growth and have reached the recommended stages.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. Repeat treatments must be made prior to crop emergence.

Unless otherwise stated, allow 7 or more days after application before tillage.

Best results are obtained when soil moisture is adequate for active weed growth.

HORSERADISH

Apply when most plants have reached the late bud to flower stage of growth. For best results, apply in late summer or fall.

Method

[Broadcast/Foliar Air](#)

[Broadcast/Foliar Ground](#)

[Hand-Held Spray](#)

Rates

[field_rates 0](#)

field_rates 1

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Restricted Entry Interval

4 hours

Timings

When most plants have reached the late bud to flower stage of growth.