

TO BE PLANTED ONLY IN EASTERN CANADA

MANAGING HARVXTRA™ ALFALFA WITH ROUNDUP READY® TECHNOLOGY



HarvXtra™ Alfalfa with Roundup Ready® Technology is the industry's first genetically enhanced, reduced lignin alfalfa technology developed to maximize alfalfa quality compared to commercially available alfalfa harvested at the same growth stage. This technology is designed to ease the yield versus quality trade-off currently faced by alfalfa producers by enabling them to maintain high-quality alfalfa longer. It also has in-plant tolerance to glyphosate, which enables growers to apply Roundup® brand glyphosate-only herbicides up to 5 days before cutting for unsurpassed weed control with excellent crop safety.

When planting HarvXtra™ Alfalfa with Roundup Ready® Technology and applying Roundup® brand glyphosate-only herbicides producers can expect:

1. Greater flexibility in harvest timing without sacrificing forage quality or forage yields
2. Higher relative hay or haylage quality and greater tonnage at later maturity stages
3. Broad spectrum weed control
4. Excellent crop safety with no or reduced crop rotation restrictions due to herbicide carry over*
5. Reduced herbicide costs

*Dependent on herbicide products used in conjunction with Roundup brand glyphosate-only herbicides in crop or for stand removal - refer to labels for any re-cropping restrictions.

STAND ESTABLISHMENT

Weed Management when Growing HarvXtra™ Alfalfa with Roundup Ready® Technology

An initial application of glyphosate between seedling emergence and the 4th trifolate growth stage is important to establish a thick and productive alfalfa stand.

It is important to understand that the trait purity for HarvXtra™ Alfalfa with Roundup Ready® Technology is 90% or greater. This means that up to 10% of the plants in a newly seeded crop will not contain the gene that provides tolerance to Roundup brand agricultural herbicides. Expect that the first application of glyphosate will result in up to 10% of the emerged plants dying. This is a normal occurrence due to the complex genetic nature of alfalfa and the breeding practices required to integrate the Roundup Ready® gene into the HarvXtra™ alfalfa plant. The remaining plants will quickly grow to fill any gaps, resulting in a thick and productive stand.

Typically, one or two applications per season of Roundup brand glyphosate-only herbicide provide excellent weed control (Table 1). Total number of in-crop applications not to exceed 3 per growing season. When Roundup WeatherMAX® herbicide is used, apply at the use rates shown in Table 1.

TABLE 1: WEED CONTROL IN ROUNDUP READY ALFALFA VARIETIES	
RATE: 1.67 L/HA SINGLE APPLICATION	RATE: 3.33 L/HA SINGLE APPLICATION
GROWTH STAGE OF CROP: Emergence until 5 days prior to cutting	GROWTH STAGE OF CROP: Emergence until 5 days prior to cutting
WEEDS CONTROLLED: Annual Grasses: Wild oats, green foxtail, volunteer barley, volunteer wheat, barnyard grass, giant and yellow foxtail, fall Panicum, wild proso millet, smooth and large crabgrass. Annual Broadleaves: Stinkweed, redroot pigweed, wild mustard, Russian thistle, lamb's-quarters, non-Roundup Ready volunteer canola (rapeseed), hempnettle, lady's-thumb, kochia, chickweed, corn spurry, wild tomato, cleavers, wild buckwheat, shepherd's purse, cow cockle, night-flowering catchfly, smartweed, stork's-bill, flixweed, narrow-leaved hawk's beard, smooth pigweed, cocklebur, Eastern black nightshade, velvetleaf, biennial wormwood ¹ . Perennials (season-long control): Quackgrass, Canada thistle, and perennial sow thistle, foxtail barley, dandelion.	WEEDS CONTROLLED: All the weeds to the left plus: Annual Broadleaves: Round-leaved mallow Perennials (season-long control): Foxtail barley ² , dandelion ² , common milkweed ³ , field bindweed, yellow nutsedge ⁴ , horsetnettle ⁵ , tall waterhemp ⁶ , bur cucumber ⁷ .
COMMENTS: All weeds should be actively growing at time of application. ¹ Biennial wormwood should be at 2-8 leaf stage.	COMMENTS: ² 3.33 L/ha rate is for large, more established plants, heavy infestation or if plants are stressed. ³ Common milkweed should be 15-60 cm in height. ⁴ Yellow nutsedge should be 5-15 cm in height. ⁵ Horse-nettle from the 2 to 12 leaf stage). ⁶ Tall waterhemp up to and including the 18-leaf stage. ⁷ Bur cucumber from the 1-18 leaf stage.

Multiple modes of action are important in managing weeds and reducing the potential selection of herbicide resistant bio-types in all crops including alfalfa. Some herbicides may be tank mixed with Roundup® brand glyphosate-only herbicides, and others may not. Your local agronomist or seed dealer can help you understand and implement an integrated weed management practice.

HARVEST DECISIONS

Many factors come into play in making sound harvest-related decisions for alfalfa. Decisions regarding harvest should focus primarily on the forage quality that is desired. With HarvXtra™ Alfalfa with Roundup Ready® Technology, growers can maintain their normal harvest schedules for higher-quality forage, or delay harvest for up to 7 days for increased yield potential, without sacrificing forage quality, compared to conventional alfalfa at the same stage of maturity.

Harvest is recommended when both forage yield and desired quality are at optimal stages, but should occur no later than 10% bloom. Under no circumstance is the stand allowed to exceed 50% bloom (this is a violation of the stewardship requirements for growing HarvXtra™ Alfalfa with Roundup Ready® Technology).

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STAND TAKE OUT

Use the following products and rates (Table 2) to remove a stand of HarvXtra™ Alfalfa with Roundup Ready® Technology plus control annual and perennial weeds, keeping in mind the following recommendations:

TABLE 2: STAND TAKE OUT
ROUNDUP WEATHERMAX® WITH TRANSORB® 2 TECHNOLOGY LIQUID HERBICIDE AT 1.67-3.33 L/HA PLUS ONLY ONE OF THE FOLLOWING TANK MIX PRODUCTS:
2,4-D* Herbicide at 1.52 L/ha or:
Banvel® II Herbicide at 1.25 L/ha or:
Lontrel® 360 Herbicide at 0.56-0.83 L/ha or:
2,4-D* Herbicide at 1.05 L/ha + Banvel II Herbicide at 1.25 L/ha or:
2,4-D* Herbicide at 1.05 L/ha + Lontrel 360 Herbicide at 0.42 L/ha
* Rate for a 564 g ae/L formulation of 2,4-D. Adjust rates for other formulations. Includes both amine and ester formulations.

- Mix with water to achieve a total applied volume of 100 L/ha
- Apply to HarvXtra™ Alfalfa with Roundup Ready® Technology in the pre-bud to start of flowering stage
- Best control is achieved when the majority of plants are in the bud stage of development

Tillage at 2-3 weeks following herbicide application can improve control and consistency under stressed conditions (drought, frost, cold temperatures).

Glyphosate herbicides, Roundup Transorb® HC and Roundup WeatherMAX® herbicides,, on their own will not control HarvXtra™ Alfalfa with Roundup Ready® Technology.

ALFALFA STEWARDSHIP REQUIREMENTS FOR EASTERN CANADA

Growers that purchase and plan to plant HarvXtra™ Alfalfa with Roundup Ready® Technology agree to comply with the following:

1. MINIMIZE POLLEN FLOW FROM HARVXTRA™ ALFALFA WITH ROUNDUP READY® TECHNOLOGY TO CONVENTIONAL VARIETIES BY:

Harvesting HarvXtra™ Alfalfa with Roundup Ready® Technology no later than 10% bloom and in no circumstance allow the stand to exceed 50% bloom. This good forage management practice increases the quality of hay and is a key stewardship requirement that will minimize the probability of pollen flow

2. ONLY PLANT HARVXTRA™ ALFALFA WITH ROUNDUP READY® TECHNOLOGY FIELDS IN AUTHORIZED GEOGRAPHIES.

Growers agree that purchased HarvXtra™ Alfalfa with Roundup Ready® Technology will only be planted in limited geographic areas (the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland), and maintain records on specific planting locations to support verification if required.

3. DIRECT ANY PRODUCT PRODUCED FROM HARVXTRA ALFALFA WITH ROUNDUP READY® TECHNOLOGY, INCLUDING HAY AND HAY PRODUCTS, ONLY TO CANADIAN OR U.S. DOMESTIC USES.

It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their product purchaser to confirm their buying position for this product.

4. DO NOT PLANT HARVXTRA™ ALFALFA WITH ROUNDUP READY® TECHNOLOGY FOR SEED OR SPROUT PRODUCTION.

5. DO NOT PLANT HARVXTRA™ ALFALFA WITH ROUNDUP READY® TECHNOLOGY IN WILDLIFE FEED PLOTS.

6. FOLLOWING STAND TERMINATION OR TAKE OUT, GROWERS MUST MONITOR FOR AND CONTROL HARVXTRA™ ALFALFA WITH ROUNDUP READY® TECHNOLOGY VOLUNTEERS PRIOR TO FLOWERING.

7. HAVE A VALID MONSANTO TECHNOLOGY STEWARDSHIP AGREEMENT (TSA) AND ABIDE BY THE MOST RECENT TECHNOLOGY USE GUIDE (TUG).

FOR MORE INFORMATION:

This technology may be sold and planted only in the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland. Please contact Forage Genetics International at 855-237-9817 or refer to the Technology Use Guide for additional information.

AN ALFALFA THAT GIVES YOU OPTIONS. NOT LIMITS.

To learn more about HarvXtra™ Alfalfa with Roundup Ready® technology, visit harvxtra.ca

Use Limitations for HarvXtra™ Alfalfa with Roundup Ready® Technology. HarvXtra™ Alfalfa with Roundup Ready® Technology hay or hay products must be directed only to Canadian or U.S. domestic uses. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their product purchaser to confirm their buying position for this product. This technology may be sold and planted only in the provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland. Please contact the Monsanto Technical Support Line at 1-800-667-4944 or refer to the Technology Use Guide for additional information.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup Ready® technology contains genes that confer tolerance to glyphosate, an active ingredient in Roundup® brand agricultural herbicides. Agricultural herbicides containing glyphosate will kill crops that are not tolerant to glyphosate. Roundup Ready® and Roundup® are registered trademarks of Monsanto Technology LLC, Monsanto Canada, Inc. licensee. HarvXtra™ is a trademark of Forage Genetics International, LLC. HarvXtra™ Alfalfa with Roundup Ready® Technology is enabled with Technology from The Samuel Roberts Noble Foundation, Inc.