

# Alfalfa with Roundup Ready® Technology and/or Alfalfa with HarvXtra® Technology



**IMPORTANT: READ PRIOR TO PLANTING**

HarvXtra® (HVX) products contain the biotechnology-derived trait developed to maximize alfalfa quality compared to commercially available alfalfa harvested at the same growth stage, by reducing the amount of lignin in the plant. 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. These products also have the same in-plant tolerance to glyphosate as Roundup Ready® (GENRR) alfalfa, which enables growers to apply glyphosate agricultural herbicides up to 5 days before cutting for unsurpassed weed control with excellent crop safety. HVX gives growers the options for managing for high quality hay/forage production, including timely cutting to promote high forage quality (i.e., generally before 10% bloom) or slightly delay harvest for higher tonnage without sacrificing acceptable forage quality, while still preventing seed.

## Weed Resistance Management Guidelines

Weed control is critical in alfalfa production for top yields and forage quality. Glyphosate offers unsurpassed broad-spectrum weed control and a wide application window for both crop and weeds. The following guidelines can maximize weed control in alfalfa varieties with GENRR and HVX technology and minimize the risk of developing resistant weeds.

- Spray labeled glyphosate agricultural herbicides soon after emergence through the 4th trifoliolate alfalfa growth stage, and before weed height exceeds 4 inches to remove competing weeds and plants.
- To control flushes of weeds in established alfalfa, make applications of labeled glyphosate herbicides at the appropriate use rate before weeds exceed 4 inches in height, up to 5 days before cutting.
- Use other approved herbicide products tank-mixed or in sequence with glyphosate agricultural herbicide as part of a weed control program if appropriate for the weed spectrum present.
- We encourage producers to practice good stewardship at all times when using herbicides, and especially when using glyphosate herbicides with glyphosate tolerant crops, including GENRR and HVX technology. This can help to prevent unwanted weed shifts and even development of resistant weed species. Use other herbicides, where appropriate, to control tough weeds.

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, contact your local sales representative. Approved labels, including supplemental labeling must be in the possession of the user at the time of pesticide application and can be obtained by contacting the State Pesticide Lead Agency for more information. Various weed biotypes are known to be resistant to other herbicides as well. Use herbicides and combinations of herbicides that will control the weed biotypes and species that are present on your farm.

## Null Plant Removal

The industry standard is 90% for the lower limit of plants expressing resistance in varieties with the GENRR gene. Plants without the GENRR gene, known as “null” plants, will be removed with the first glyphosate application. Ideally, this application should occur after the stand is fully established but before it begins its natural thinning process as plants mature. As alfalfa plants approach full stature, the number of plants per square foot begins to decline as plants

compete with each other for light, soil moisture and nutrients. For this reason, the first application of a glyphosate herbicide should be made soon after stand establishment, to take out the null plants before they begin this competition phase. With this strategy, glyphosate herbicides can be applied in later years without fear of null plant loss.

## Stand Take-out Guidelines

In conventional or alfalfa varieties with the GENRR gene, proper stand take-out at the end of a stand's useful life is important to prevent competition with the subsequent crop.

Stand take-out for varieties with GENRR is similar to that of conventional alfalfa except that glyphosate is ineffective for this purpose. An over-the-top application of a translocated growth regulator herbicide like 2,4-D and/or dicamba is usually effective, especially when followed by some kind of tillage operation that breaks up roots and/or covers crowns and top growth.

*Control of alfalfa during the stand takeout operation is much better than trying to control volunteers in the rotational crop.* Use recommended and commercially available mechanical and/or herbicidal methods for managing volunteer alfalfa with GENRR in rotational crop fields. Rotation with certain broadleaf crops is not advisable if the grower is not willing to implement recommended stand termination practices.

## Management of GENRR and HVX Volunteers in Rotational Crop Fields

In a timely manner, use recommended and commercially available mechanical and/or herbicidal methods for managing GENRR and HVX technology volunteers in rotational crop fields.

- Implement treatments before volunteers become too large to control or begin to compete with the rotational crop.
- Herbicide alternatives are available for management of volunteer alfalfa in grass crops.
- Rotation with certain broadleaf crops is not advisable if the grower is not willing to implement recommended stand termination practices.
- In the event that no known mechanical or herbicidal options are available to manage GENRR or HVX technology volunteers in the desired rotational crop, you should change to a crop with established volunteer management practices for that rotation.

Note: Glyphosate agricultural herbicides are **not** effective for terminating GENRR or HVX technology volunteers.

## Stewardship Requirements

**Planting Limitation:** GENRR and HVX alfalfa planting is not permitted for wildlife feed plots and not for the production of sprouts. Growers who plant alfalfa with GENRR and HVX technology by flying on seed must be responsible to prevent and control any resulting feral alfalfa plants.

**Hay and Forage Production:** Alfalfa with GENRR and HVX technology should be managed for high quality hay/forage production, including timely cutting to promote high forage quality (i.e. before 10% bloom) to prevent seed development. Additionally, HVX gives growers the option to slightly delay

harvest for higher tonnage without sacrificing acceptable forage quality, while still preventing seed.

In geographies where conventional alfalfa seed production is intermingled with forage production, alfalfa with GENRR and HVX technology must be harvested at or before 10% bloom to minimize potential pollen flow to conventional alfalfa. Alfalfa growers in such areas must also control any feral alfalfa resulting from the use of alfalfa containing GENRR and HVX technology. Growers in other areas should harvest before 50% bloom. Growers who are unwilling or who cannot make this commitment to stewardship should not plant or continue to grow alfalfa with GENRR and HVX technology.

## Compliance Requirements

Alfalfa containing GENRR and HVX technology is for sale and planting only in the United States, and not for the production of sprouts or seed. Any product produced from an alfalfa crop or seed containing GENRR and HVX technology, including hay and hay products, may only be used, exported to, processed or sold in countries where regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Always read and follow pesticide label directions. Crops and materials containing biotech traits may only be exported to or used, processed, or sold in jurisdictions where all necessary regulatory approvals have been granted for those crops and materials. It is a violation of national and international laws to move materials containing biotech traits across borders into jurisdictions where their import is not permitted.

Growers may be required to provide copies of records, receipts, and other sales-related documents, including during an audit or inspection consistent with the Product Use Guide, including the portions relating to alfalfa with HVX and GENRR technology.

**Producing a seed crop or a seed catch crop is prohibited except under an authorized seed production contract.** Also, alfalfa with GENRR and HVX technology is not permitted to be planted in any wildlife feed plots.

**Technology Use Agreement:** The *Seed and Technology Use Agreement* provides growers the opportunity to purchase, plant and benefit from alfalfa varieties with GENRR and HVX technology. Monsanto Company's Roundup Ready gene technology is protected under U.S. patent law. Signing and acceptance of the *Seed and Technology Use Agreement* is necessary before the seed can be delivered to the grower.

**Seed & Feed Use Agreement:** Additionally, all plantings of HVX shall include execution by the grower of a Seed and Feed Use Agreement noting that HVX can only be used on farm or otherwise used in the United States.

**California Restriction:** Due to special circumstances, alfalfa growers in the Imperial County, California must comply with additional stewardship requirements. No sales professional is authorized to sell alfalfa seed with the GENRR gene to growers intending to plant in the Imperial County, California.

**China Export Restriction:** Prior to planting GENRR and/or HVX technology, please be aware that while many import market approvals have been granted, alfalfa seed of varieties with GENRR and/or HVX technology, and hay and hay products grown from seed of varieties with GENRR and/or HVX technology, are restricted from export to China.

**PRODUCT USE STATEMENT FOR RR ALFALFA:** This variety contains the Roundup Ready® gene, developed by Monsanto Co. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. Do not export seed with the Roundup Ready® Alfalfa technology or crop, including hay or hay products, to China pending import approval. In addition, due to the unique cropping practices, do not plant this product in Imperial County, California. 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 grain handler or product purchaser to confirm their buying position for this product.

**Always Read and Follow Pesticide Label Directions.** Alfalfa with the Roundup Ready® technology provides crop safety for over-the-top applications of labeled glyphosate herbicides when applied according to label directions. Glyphosate agricultural herbicides will kill crops that are not tolerant to glyphosate.

**ACCIDENTAL APPLICATION OF INCOMPATIBLE HERBICIDES TO THIS VARIETY COULD RESULT IN TOTAL CROP LOSS.**

**THIS SEED IS ACQUIRED UNDER AN AGREEMENT THAT INCLUDES THE FOLLOWING TERMS:** The licensed U.S. Patents for the Roundup Ready® technology can be found at the following web page [www.monsantotechnology.com](http://www.monsantotechnology.com). IF YOU HAVE NOT SIGNED A SEED AND TECHNOLOGY USE AGREEMENT, THEN THIS DOCUMENT IS NOT AN OFFER OR ACCEPTANCE OF AN OFFER FOR SALE OF THE PRODUCTS LISTED AND ANY PURPORTED SALE OF SUCH PRODUCTS IS VOID. IF YOU HAVE RECEIVED PRODUCTS WITHOUT SIGNING A SEED AND TECHNOLOGY USE AGREEMENT, YOUR USE OF THOSE PRODUCTS IS UNAUTHORIZED AND UNLICENSED AND YOU MUST, EITHER (i) RETURN SUCH PRODUCTS, OR (ii) SIGN A TECHNOLOGY USE AGREEMENT FOR SUCH PRODUCTS.

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**PRODUCT USE STATEMENT FOR HARVXTRA ALFALFA:** This variety contains the Roundup Ready® gene, developed by Monsanto Co. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. Do not export seed with the Roundup Ready® Alfalfa technology or crop, including hay or hay products, to China pending import approval. In addition, due to the unique cropping practices, do not plant this product in Imperial County, California. 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 grain handler or product purchaser to confirm their buying position for this product.

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HarvXtra® is a registered trademark of Forage Genetics International, LLC. HarvXtra® Alfalfa with Roundup Ready® Technology is enabled with Technology from The Samuel Roberts Noble Foundation, Inc.