



• U.S. TECHNOLOGY USE GUIDE •

2024

TUG

• INSECT RESISTANCE MANAGEMENT GUIDE •





Helpful Apps



Climate FieldView™ Platform offers a comprehensive, connected suite of digital ag tools to help you optimize resources and maximize yield. Using real-time and historical crop and weather data, FieldView delivers customized insights that help you make important agronomic decisions with confidence.

The app is available from climate.com and itunes.apple.com



FieldView™ Cab device is a simple and powerful farm management app that enables growers to collect and understand field data through rich maps and reports. It combines the best in real-time cab monitoring with simple field data analysis into a mobile app that benefits from the portability and connectivity of the iPad®.

The app is available from climate.com and itunes.apple.com



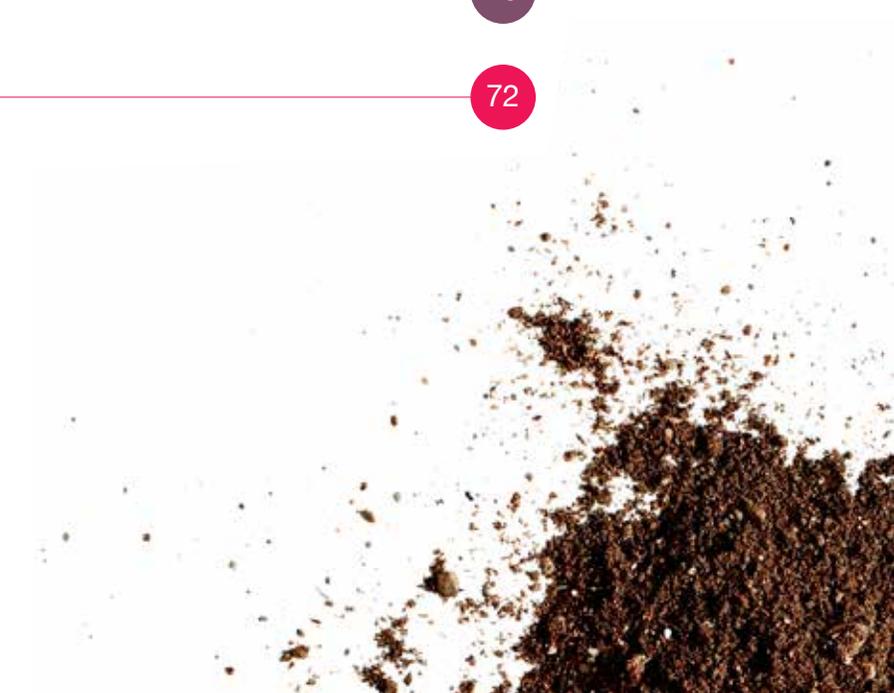
RRXtend Spray app helps you plan sprays more effectively by providing weather forecasts that include inversion risk probability and the ability to create and retain application records. The RRXtend Spray app also provides access to valuable Roundup Ready® Xtend Technology information, educational videos, training information and other stewardship information.

The app is available from itunes.apple.com and play.google.com



Contents

Stewardship Overview	4
Corn Technologies	20
Cotton Technologies	30
Soybean Technologies	40
Canola Technologies	50
Wheat Technology	62
Alfalfa Technologies	64
Sugarbeet Technology	70
Sweet Corn Technologies	72

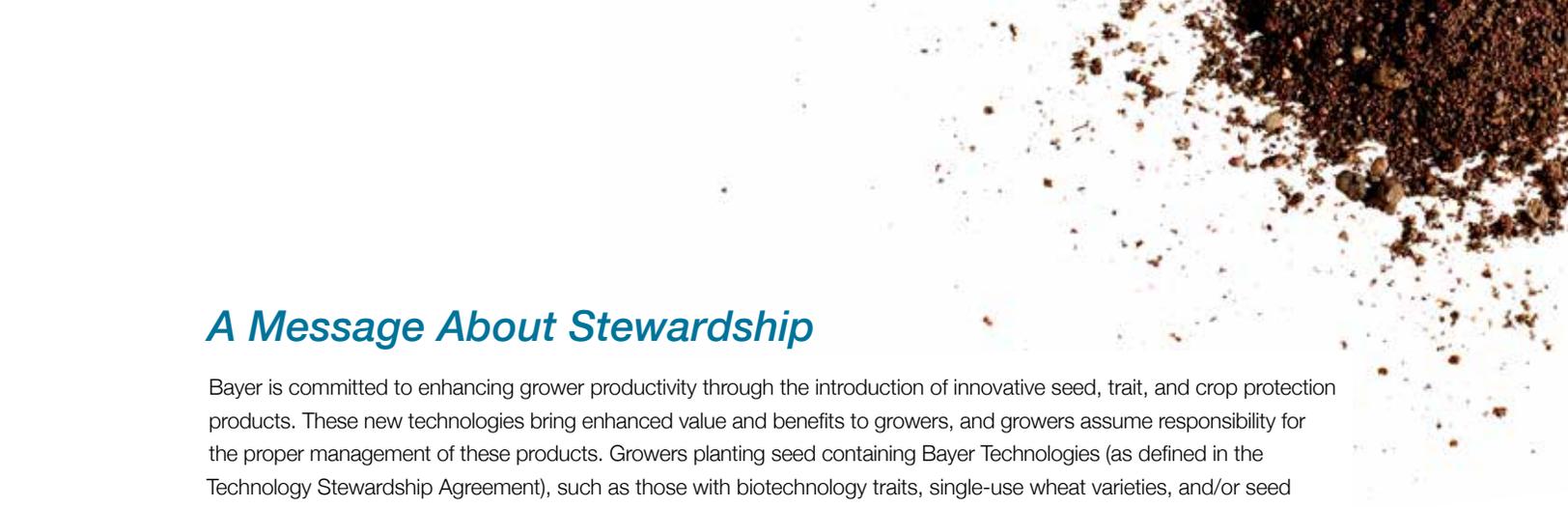


Stewardship Overview

This Technology Use Guide (TUG) is a valuable source of technical information about Bayer CropScience LP's (Bayer's) current portfolio of seed products containing biotechnology-derived traits, related crop protection products, seed treatments, and single-use wheat varieties. It sets forth some of the requirements, recommendations, and Best Management Practices (BMPs) for the use of these products.

Growers planting corn or cotton seed that contains *Bacillus thuringiensis* (*B.t.*) traits also must read and follow the applicable 2024 Insect Resistance Management (IRM) Grower Guide. The Corn and Cotton IRM Grower Guides are included in this TUG.

This TUG is not a pesticide product label. It is intended to provide additional information and highlight approved uses allowed by certain product labels. Read and follow all precautions and requirements in the label booklet and any separately published supplemental labeling for the agricultural herbicide or any other pesticide product you are using. Nothing in this TUG should be construed as a substitute for reading and following all product labeling.



A Message About Stewardship

Bayer is committed to enhancing grower productivity through the introduction of innovative seed, trait, and crop protection products. These new technologies bring enhanced value and benefits to growers, and growers assume responsibility for the proper management of these products. Growers planting seed containing Bayer Technologies (as defined in the Technology Stewardship Agreement), such as those with biotechnology traits, single-use wheat varieties, and/or seed treatments, agree to implement all stewardship requirements, which include, but are not limited to, the following:

- Read, sign, and comply with the Technology Stewardship Agreement and obtain a grower license number from Bayer or its permitted designee before purchasing or using any product or technology covered by the Technology Stewardship Agreement. If you have not read and signed a Technology Stewardship Agreement, you can go to **AgCelerate.com** to complete the online licensing process. If you already hold a valid Technology Stewardship Agreement, this Technology Use Guide (TUG) is included in the current terms and conditions of that Technology Stewardship Agreement.
- Note that the terms of the Technology Stewardship Agreement and the TUG are updated by Bayer from time to time. The most recent version of the Technology Stewardship Agreement can be found at these links: **AgCelerate.com** and **tug.bayer.com**, and the most recent version of the TUG can be found at **tug.bayer.com**.
- Read, understand, and follow all the requirements and directions for use on all seed bags, product labels and/or tags.
- Read and understand the applicable IRM Grower Guide prior to planting seed containing insect-protected traits and comply with the specific IRM requirements for those traits as mandated by the U.S. Environmental Protection Agency (EPA).
- Cooperate and comply with any additional IRM/Integrated Pest Management (IPM) programs that Bayer communicates or makes available.
- Observe regional planting restrictions mandated by the EPA.
- Use seed containing Bayer Technologies (as defined in the Technology Stewardship Agreement) solely for planting a single commercial crop in the United States.
- Comply with any additional stewardship requirements, such as grain or feed use agreements, product marketing requirements, or geographical planting restrictions that Bayer deems appropriate or necessary for proper stewardship or to comply with regulations.
- Sell crops or material containing biotechnology traits only to grain handlers who confirm their acceptance, or who use those products on-farm.
- Do not move seed or material containing biotechnology traits across international boundaries or into nations where import is not permitted.
- Do not use, plant, apply, sell, promote, or distribute a product within a state where the product is not yet registered by the appropriate regulatory authorities.
- Follow all applicable stewardship recommendations as outlined in this TUG.
- Follow the Herbicide Resistance Management Recommendations and the Corn Rootworm BMPs to help minimize the risk of developing weed or insect resistance, respectively.
- Always read, understand, and follow pesticide label directions and requirements. The label is the law.
- It is important to only use pesticides that are approved in your state and only for the applications that are permitted on the pesticides' labels. Applying a pesticide in a manner not permitted on its label is a violation of federal laws, could subject you to fines, and may also result in adverse license effects, including, but not limited to, termination of your Technology Stewardship Agreement.
- Not all pesticide products (even if they have the same active ingredients) have the same use requirements or the same instructions for use. Do not assume that because a pesticide product is approved for use in a specific manner and at a specific time, that the same use is allowed for a different pesticide product, even with the same active ingredients.
- Follow proper disposal of unused pesticide, rinsate, treated seed and product packaging in accordance with the label and seed bag tag requirements.
- If you have questions about a Bayer pesticide product, please call **1-866-992-2937**.

Why is Stewardship Important?

- 1 Signing a Technology Stewardship Agreement gives a grower access to Bayer's patented germplasm, seed containing its patented traits, and other seed products, such as WestBred® single-use wheat varieties. Growers also receive limited warranties on Bayer Technology performance and the opportunity to participate, when eligible, in various Bayer programs such as Bayer PLUS Rewards.
- 2 Following IRM requirements helps to prevent the development of insect resistance to *B.t.* technologies, enables the long-term durability of these technologies, and meets EPA requirements.
- 3 Using seed containing Bayer Technologies for planting a single commercial crop encourages investment in seed innovations that help sustain long-term productivity for growers.

Crop or Material Handling Stewardship Statement

The following Excellence Through Stewardship® statement applies to Roundup Ready® Corn 2, DroughtGard® Hybrids with Roundup Ready® Corn 2, VT Double PRO® Corn, DroughtGard® Hybrids with VT Double PRO® Corn, VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, VT Triple PRO® Corn, DroughtGard® Hybrids with VT Triple PRO® Corn, VT Triple PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend, VT4PRO™ Corn, VT4PRO™ RIB Complete® corn blend, SmartStax® Corn, SmartStax® RIB Complete® corn blend, SmartStax® PRO and SmartStax® PRO RIB Complete® corn blend, Preceon™ Smart Corn System, Trecepta® Corn, Trecepta® RIB Complete® corn blend, Bollgard II® Cotton, Bollgard II® with Roundup Ready® Flex Cotton, Bollgard II® XtendFlex® Cotton, Bollgard® 3 XtendFlex® Cotton, Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, XtendFlex® Cotton, Roundup Ready® Flex Cotton, Roundup Ready® Spring Canola, Roundup Ready® Winter Canola, TruFlex® Canola with Roundup Ready® Technology, TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies, DEKALB® LibertyLink® Canola, Performance Series® Sweet Corn, Roundup Ready 2 Yield® Soybeans, Roundup Ready 2 Xtend® Soybeans, XtendFlex® Soybeans and Vistive® Gold Soybeans with Roundup Ready 2 Yield® Technology:

Bayer is a member of Excellence Through Stewardship® (ETS). Bayer products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Bayer's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. This product has been approved for import into key export markets with functioning regulatory systems. 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. It is a violation of national and international law to move material containing biotechnology 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.

The following Excellence Through Stewardship statement applies to Roundup Ready® Alfalfa and HarvXtra® Alfalfa with Roundup Ready® Technology:

Forage Genetics International, LLC ("FGI") is a member of Excellence Through Stewardship® (ETS). FGI products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with FGI's

Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. Any crop or material produced from this product can only be exported to, or used, processed or sold only in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotechnology 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. Growers should refer to [biotradestatus.com](https://www.biotradestatus.com) for any updated information on import country approvals. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.

The following Excellence Through Stewardship statement applies to Roundup Ready® Sugarbeets:

KWS SAAT SE & Co. KGaA ("KWS") is a member of Excellence Through Stewardship® (ETS). KWS has imposed strict rules on itself relating to the responsible use of genetic engineering and plant materials created through its use. KWS has been a member of the industry initiative "Excellence Through Stewardship®" (ETS) since 2013. ETS is an integral component of our quality management system. KWS products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in conformance with the KWS stewardship program. This product (and any crop, material or byproduct produced or resulting from it) can only be exported to, or used, processed or sold in countries where all necessary regulatory and other legal approvals have been expressly granted. It is illegal to transfer material containing biotechnology traits into countries where import of this material is restricted or not permitted. Excellence Through Stewardship is a registered trademark of Excellence Through Stewardship.

Please see the product-specific sections of Roundup Ready® Flex Pima Cotton, Roundup Ready® Alfalfa and HarvXtra® Alfalfa with Roundup Ready® Technology for important information including material handling on those products.

Bayer is a member of the Seed Innovation and Protection Alliance (SIPA), an organization established to promote the understanding and value of seed innovations as well as to facilitate and promote the respect of intellectual property rights for the benefit of members, growers, industry associates, consumers and the agricultural community. For more information about SIPA, visit seedipalliance.com.

Intellectual Property Rights

If Bayer reasonably believes that a grower may have planted saved seed in violation of the terms of the Technology Stewardship Agreement and/or contrary to Bayer's intellectual property rights, Bayer or Bayer's agents will request invoices and business records to confirm that the grower has not planted saved seed and instead planted the field(s) with seed purchased from an authorized dealer. This information is to be provided within seven days after a written request. At times, Bayer may also enforce its rights to inspect, test, and sample a grower's field(s) pursuant to the terms of the Technology Stewardship Agreement.

If you have questions about the intellectual property for seed or traits or become aware of anyone who may be saving seed or otherwise planting unauthorized seed in violation of their Technology Stewardship Agreement, please speak with your Bayer representative or contact us in any of the following ways:

Phone: 1-866-992-2937

Online: cropscience.bayer.us/contact

Letter: Trait Stewardship

622 Emerson Rd, Suite 150

Creve Coeur, MO 63141

Anyone may provide anonymous or confidential information as follows:

"Anonymous" reporting occurs when a person reports information to Bayer in such a way that the identity of the person reporting the information cannot be identified. This kind of reporting includes telephone calls requesting anonymity, emails, and unsigned letters.

"Confidential" reporting occurs when a person reports information to Bayer in such a way that the reporting person's identity is known to Bayer. Every effort will be made to protect a person's identity, but it is important to understand that a court may order Bayer to reveal the identity of people who are "known" to have supplied relevant information.

For more information on seed and trait intellectual property, go to **traits.bayer.com** and select "Stewardship" at the top of the page.

Commitment to Steward Insect-Protected Traits



Bayer is committed to the success of our grower customers by providing practical, flexible, and cost-effective solutions that address on-farm challenges, contribute to grower choice and provide economic benefits to our customers. To help ensure that insect-protected traits (e.g., *B.t.* traits) remain a viable tool for growers, we are committed to ongoing conversations with the corn and cotton industries on the following IRM efforts to establish the most comprehensive approach to the stewardship of corn and cotton insect-protected traits.

Bayer's ongoing IRM efforts include:

- Continually working to increase overall awareness of the need for, and adoption of, strong IRM programs through our Bayer seed dealers as well as the academic community.
- Carefully evaluating the need for—and practicality of—updating our BMPs or agronomic recommendations as new scientific data become available. Updates may include information tailored to local growing conditions, refuge compliance, scouting techniques, the addition of soil- and seed-applied insecticides, maturity and harvest schedules, soil management practices, crop rotation and adoption of products with multiple modes of action.
- Expanding our offering of multi-trait corn hybrids and cotton varieties that provide multiple modes of action, increasing the durability of traits. We encourage growers to try these seeds with enhanced protection as the product line expands in their area.
- Researching and developing other genes in our pipeline so that we can continue to deliver products with new and increased modes of action.
- Continuing multiyear, targeted resistance monitoring of insect populations through the Agricultural Biotechnology Stewardship Technical Committee (ABSTC), a consortium of agricultural biotechnology companies.
- Actively investigating reports of insect resistance.
- Conducting thorough, generational studies on sample insect populations as appropriate to determine if stable and inherited resistance is present.
- Monitoring and studying the occasional performance issues in fields with very high insect injury levels that exceed commercial thresholds.

Insect Resistance Management Requirements

An effective insect resistance management (IRM) program is a vital part of responsible product stewardship for insect-protected biotechnology products.

Bayer is committed to implementing an effective IRM program for all its insect-protected technologies in all countries where they are commercialized. Such programs are based on available knowledge, practicality, grower acceptance and implementation of the plan.

The EPA requires that Bayer implement, and that growers who purchase insect-protected products follow, an IRM plan. IRM programs for insect-protected traits are based on an assessment of the biology of the major target pests, grower needs, agronomic practices, and appropriate pest management practices. These mandatory regulatory programs have been developed and updated in cooperation with grower and consultant organizations, including the National Corn Growers Association, the National Cotton Council, extension specialists, academic scientists and regulatory agencies.

These programs contain several important elements. One key component is a refuge. A refuge is simply a portion of the relevant crop that does not contain an insect-protected technology for the target insect pests. The lack of exposure to an insect protection protein allows susceptible insects emerging from the refuge to mate with the rare resistant insects that may emerge from the insect-protected crop. Susceptibility to the insect-protected technology would then be passed onto their offspring, helping to preserve the long-term effectiveness of that and possibly other insect-protected technologies.

Growers who purchase seeds containing an insect protection technology must plant a refuge.* Refuge size, configuration and management are described in detail in the current IRM Grower Guide and in the Corn and Cotton sections of this Technology Use Guide.

Bayer is committed to the preservation of insect-protected technologies. Please do your part to preserve insect-protected technologies by implementing the correct IRM plan on your farm. Failure to follow IRM requirements and to plant a proper refuge may result in the loss of a grower's access to Bayer insect-protected technologies.

Compliance Monitoring Program

The EPA requires Bayer to take corrective measures in response to a finding of grower IRM non-compliance. As mandated by the EPA, Bayer or an approved agent of Bayer must monitor grower compliance with IRM and refuge requirements. The Technology Stewardship Agreement signed by the grower requires that upon request by Bayer or its approved agent, a grower must provide the location of all fields planted with Bayer insect-protected technologies and the locations of all associated required refuge areas. The grower must fully cooperate with any field inspections and allow Bayer, or an agent of Bayer, to inspect all fields and refuge areas to ensure an approved IRM program has been followed. All inspections will be performed at a reasonable time and arranged in advance with the grower so that the grower can be present.

Questions? We're Here to Help.

Bayer works collaboratively to develop and implement IRM programs that strike a balance between available knowledge and practicality, with grower acceptance and implementation of the plan as critical components. Refuge requirements vary by the type of product being planted and the location of planting. Growers must plant the amount of refuge acres for a product that is required for their growing region. Please contact your seed dealer with any questions about IRM or refuge requirements and/or call **1-866-992-2937**.

Growers should monitor their fields and contact their seed dealer or Bayer at 1-866-992-2937 if performance problems are observed.

IRM Requirement

Growers must read the current IRM Grower Guide prior to planting for information on required IRM. The corn and/or cotton IRM Grower Guide is located on the seed bag tag.



Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, **including applicable refuge requirements for insect resistance management**, for the biotechnology traits expressed in the seed as set forth in the Technology/Stewardship Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation and agreement to comply with the most recent stewardship requirements.

*In some areas, a natural refuge option is available for cotton containing Bollgard II®, Bollgard® 3, Bollgard® 3 ThryvOn™ Cotton Technologies, and Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology. For Performance Series® Sweet Corn products, instead of planting a refuge, the crop must be destroyed no later than 30 days following harvest (but preferably within 14 days). When planted in the Corn-Growing Area, as defined on page 25, there are no requirements for a separate structured refuge for SmartStax® RIB Complete® corn blend, SmartStax® PRO RIB Complete® corn blend, Trecepta® RIB Complete® corn blend, VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, VT Triple PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend, and VT4PRO™ RIB Complete® corn blend. However, in the Cotton-Growing Area, a separate 20% structured refuge is required when planting SmartStax® RIB Complete® corn blend, SmartStax® PRO RIB Complete® corn blend, Trecepta® RIB Complete® corn blend, VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, VT Triple PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend, and VT4PRO™ RIB Complete® corn blend. See the current IRM Grower Guide on the corn and/or cotton bag tag for details.

Integrated Pest Management Recommendations

Integrated pest management (IPM) describes an effective and environmentally sustainable approach to pest management that relies on a combination of common-sense practices.

IPM programs use relevant, comprehensive information on the life cycles of pests and their interaction with the environment. This information is used to manage pests in a manner that is least impactful to people, property and the environment.

Preventing Pest Adaptation

Use BMPs in conjunction with the appropriate seed product to help obtain the greatest yield benefits.

Use seed products, seeding rates and planting technologies appropriate for each crop and geographical area. As much as possible, manage the crop to avoid plant stress. Here are some additional suggestions:

- Use proper crop rotation practices and products to control pests, making it more difficult for pests to adapt. In areas where crop rotation is not practiced, or where rotation occurs but high pest populations are observed, the use of products with multiple modes of action, such as SmartStax® RIB Complete® corn blend, is strongly recommended.
- Employ appropriate scouting techniques and treatment decisions to preserve beneficial insects that can provide additional insect pest control.
- Manage for appropriate maturity and harvest schedules.
- Use soil management practices that encourage destruction of over-wintering pests.

Monitoring Pests

Carefully monitor fields for all pests and follow regional pest management recommendations to determine the need for remedial insecticide treatments. For target pests, scouting techniques and supplemental treatment decisions should consider the fact that larvae must hatch and feed before they will be affected by the insect protection protein(s). For Lepidopteran pests, fields should be scouted regularly following periods of heavy or sustained egg lay, especially during bloom or flowering, to determine if significant larval survival has occurred.

In cotton, scouting for Lepidopteran pests should include a modified whole-plant inspection, including terminals and all stages of fruit. Larvae larger than 1/4 inch (3 to 4 days old) are generally recognized as survivors that may not be controlled by products with Bollgard II® and Bollgard® 3 Cotton Technologies.

In cotton, scouting for thrips or tarnished plant bug species should include specific insect counts for each species, along with square retention estimates for tarnished plant bug. Please reference your local state extension office for specific economic thresholds for thrips and tarnished plant bugs, as well as specific sampling techniques. Scouting is critical to determine which and how many insecticide applications are recommended to avoid economic losses greater than the pest management costs (i.e., when economic thresholds are met).

ThryvOn™ Cotton Technology does not provide complete control of tarnished plant bug or thrips species, but may reduce the number of insects present, so continue to scout and spray according to locally established economic thresholds.

Controlling Cotton Pests

Bayer recommends the use of appropriate remedial insecticide treatments to help provide desired levels of control if any cotton insect pest reaches locally established economic thresholds in products with Bollgard II®, Bollgard® 3 and ThryvOn™ Cotton Technologies.

Although products with Bollgard II®, Bollgard® 3 and ThryvOn™ Cotton Technologies may sustain less damage from some of the most troublesome lepidopteran, tarnished plant bugs and thrips pests, they will not provide protection against all pests and may require insecticide treatments of target pests under conditions of high pest pressure. Insect pests should be monitored and treated with insecticides when necessary, using recommended economic thresholds from the local state cooperative extension service, professional consultants or other qualified authorities. Whenever possible, select insecticides that are least harmful to beneficial insects.

Performance Series® Sweet Corn

Performance Series® Sweet Corn can control corn earworm under typical infestation levels, but to help ensure quality ears at harvest, supplemental insecticide applications may be required when corn earworm populations are above economic thresholds. Protection from corn earworm must be coupled with thorough scouting and spray programs to help maximize marketable yield potential. Destroy crop residue immediately after harvest to avoid regrowth and minimize selection for insect resistance in late-season infestations.

Weed Management

Bayer believes product stewardship is a fundamental component of customer service and responsible business practices.

Bayer is committed to the proper use and long-term effectiveness of its proprietary herbicide brands through a four-part stewardship program:

- 1) developing appropriate weed control recommendations,
- 2) continuing research to refine and update recommendations,
- 3) educating on the importance of effective weed management, and
- 4) promptly responding to weed control inquiries through a product performance evaluation process.

As a leader in the development and stewardship of Roundup® Brand Agricultural Herbicides, Roundup Ready® Crops, Roundup Ready® Xtend Crops and other products, Bayer invests significantly in research conducted in conjunction with academic scientists, extension specialists and crop consultants. This investment includes an evaluation of the factors that can contribute to the development of herbicide resistance and how to properly manage weeds to delay the selection for herbicide resistance. Visit the Weed Science Society of America (WSSA) at wssa.net and iwilltakeaction.com to access herbicide-resistance training lessons that provide in-depth educational information. Get rewarded for using Bayer products, including a wide range of herbicides. Visit

MyBayerPLUS.com to sign up and learn more about this rewards program.



Herbicide Classification Group Number

Glyphosate, the active ingredient in products such as Roundup WeatherMAX®, Roundup PowerMAX® and Roundup PowerMAX® II herbicides or the more concentrated Roundup PowerMAX® 3 herbicide, is a Group 9 herbicide based on the mode of action classification system of the WSSA. Using the same system, glufosinate, the active ingredient in Liberty® brand herbicides, is a Group 10 herbicide, and dicamba, the active ingredient in XtendiMax® herbicide with VaporGrip® Technology, a restricted-use pesticide, is a Group 4 herbicide. Acetochlor, an active ingredient in Harness® and Warrant® brand herbicides, is a Group 15 herbicide. To learn more about herbicide group classification, visit or download apps at iwilltakeaction.com or hracglobal.com. Any weed population may contain plants naturally resistant to any herbicide group(s). Such resistant weed plants may not be effectively managed when using an herbicide(s) to which the weed plants are resistant. They may be effectively managed utilizing another herbicide from a different mode of action group by mixing one herbicide with herbicides from different groups and/or by using cultural or mechanical weed control practices. It is important to note that a weed plant may be resistant to more than one herbicide group. Consult your local brand representative, state cooperative extension service, professional consultants or other

qualified authorities to determine appropriate actions for treating specific resistant weeds.

XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent volatility reduction adjuvant). For approved tank-mix products (including VRAs and DRAs), nozzles and other important label information visit XtendiMaxApplicationRequirements.com. Applicators must check XtendiMaxApplicationRequirements.com no more than 7 days before application of this product for additional labeling, including state restrictions. Where applicable, users must comply with additional requirements found on this website.

Weed Management Recommendations

Proactively implementing diversified weed control strategies to help minimize selection for weed populations resistant to one or more herbicides is recommended. A diversified weed management program may include the use of multiple herbicides with different mechanisms of action and overlapping weed spectrum, with or without mechanical operations (e.g., tillage) and/or other cultural practices. Research has demonstrated that using the labeled rate of the herbicide and following label use directions are important steps that help delay the selection for herbicide resistance in weeds. Scouting after a herbicide application is important because it facilitates the early identification of weed shifts and/or possible herbicide-resistant weeds and thus provides direction on future weed management practices. One of the best ways to manage resistant populations is to implement measures to avoid allowing weeds to reproduce by seed or to proliferate vegetatively. Cleaning equipment between sites and avoiding movement of plant material between sites will greatly aid in reducing the spread of resistant weed seed.

It is important to start with a clean field, by using either a burndown herbicide application or tillage, and to optimize herbicide performance by controlling weeds early when they are small and actively growing.

In summary:

- Scout your fields before and after application.
- Start with a clean field, free of weeds.
- Use a diverse set of weed control tools, including residual herbicides that use a different mode of action that are effective on the target weeds.
- Add other herbicide products, at the right rate and timing for post-emergence weed control as allowed by the product label. Control weed escapes and remove weeds before they set seed.
- Clean equipment before leaving the field to prevent spread of weed seeds.

Weed Management *continued*



Bayer supports the Take Action Pesticide-Resistance Management partnership. Take Action is an industry-wide partnership between university weed scientists, major herbicide providers and organizations representing corn, cotton, sorghum, soybean and wheat growers to help prevent and manage herbicide-resistant weeds. The Take Action effort encourages the development of a proactive strategy that incorporates a diverse set of controls to manage herbicide-resistant weeds. To learn more, visit [iwilltakeaction.com/weeds](https://www.iwilltakeaction.com/weeds), or contact your local extension office.



What to Do When Dicamba- or Glyphosate-Resistant Weeds are Suspected or Present

Bayer investigates new claims of suspected weed resistance cases to Bayer branded herbicides. Report any incidence of repeated non-performance of Bayer branded herbicide products on a particular weed to the appropriate company representative, local retailer or county extension agent. To manage herbicide-resistant weeds, Bayer provides recommended control measures, which may include additional herbicides, label-approved tank mixes, mechanical and/or cultural practices. Bayer actively communicates all this information to growers through multiple channels, including the herbicide label, supplemental labeling, this TUG, media and written communications, www.roundupreadyxtend.com, www.MyBayerPLUS.com, www.weedscience.org (a database on herbicide-resistant weeds), grower meetings and Bayer-supported external programs. Bayer will report any unique case of confirmed herbicide resistance at www.weedscience.org.

Growers must be aware of, and proactively manage for, dicamba- or glyphosate-resistant weeds in planning their weed control program. If a weed is known to be resistant to dicamba or glyphosate, then a resistant population of that weed is, by definition, no longer controlled with labeled rates of dicamba or glyphosate herbicides. Roundup WeatherMAX®, Roundup PowerMAX® Roundup PowerMAX® II herbicides or the more concentrated Roundup PowerMAX® 3 herbicide, are not warranted to cover the failure to control glyphosate-resistant weed populations; XtendiMax® herbicide with VaporGrip® Technology is not warranted to cover the failure to control dicamba-resistant weed populations.

Recommendations for Managing Resistant Weeds in Roundup Ready® Xtend Crops

Various weed biotypes are known to be resistant to glufosinate, glyphosate and/or dicamba. For regional weed management recommendations specifically related to cotton and soybeans in Roundup Ready® Xtend Crops, refer to [roundupreadyxtend.com/weedmanagement](https://www.roundupreadyxtend.com/weedmanagement), and for more information on the Integrated Weed Management Program, visit [iwm.bayer.com](https://www.iwm.bayer.com). In addition, visit the Weed Science Society of America at [wssa.net](https://www.wssa.net) to access herbicide resistance training and [iwilltakeaction.com](https://www.iwilltakeaction.com) for additional stewardship program resources. A complete list of specimen labels is available at www.cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Read and follow all product labeling before making in-crop or other applications of Bayer branded glyphosate herbicides, Bayer branded dicamba herbicides or using any other pesticide. For supplemental labels or fact sheets for Bayer products, call 1-866-992-2937. Bayer does not restrict your ability to use any herbicide so long as the product is specifically registered and labeled for in-crop use on the applicable crop. Read the product label or contact the product manufacturer if you have questions about EPA or state approvals for in-crop use. BAYER DOES NOT MAKE ANY REPRESENTATIONS, WARRANTIES OR RECOMMENDATIONS CONCERNING THE USE OF PRODUCTS MANUFACTURED OR MARKETED BY COMPANIES OTHER THAN BAYER, INCLUDING BUT NOT LIMITED TO THOSE THAT ARE LABELED FOR USE IN CROP(S) CONTAINING BAYER TECHNOLOGY. BAYER SPECIFICALLY DISCLAIMS ALL RESPONSIBILITY FOR THE USE OF THESE PRODUCTS IN CROP(S) CONTAINING BAYER TECHNOLOGY. ALL QUESTIONS AND COMPLAINTS ARISING FROM THE USE OF PRODUCTS MANUFACTURED OR MARKETED BY OTHER COMPANIES, OR THE IMPACT TO BAYER TECHNOLOGY FROM THE USE OF SUCH PRODUCTS, SHOULD BE DIRECTED TO THOSE OTHER COMPANIES.

Glyphosate Endangered Species Requirement

Before making an application of any glyphosate-based herbicide product, licensed growers of crops containing Roundup Ready® Technology must access the website pre-serve.org to determine whether any mitigation requirements apply to the planned application to those crops and must follow all applicable requirements. The mitigation measures described on the website are appropriate for all applications of any glyphosate-based herbicide to all croplands. If a grower does not have web access, the grower can contact their seed dealer or call 1-800-332-3111 for assistance.

Tank Mixing with Roundup® Herbicides

Roundup WeatherMAX®, Roundup PowerMAX® and Roundup PowerMAX® II herbicides, and the more concentrated Roundup PowerMAX® 3 herbicide, are products sold for in-crop use in 2024.



Tank mixtures of Roundup WeatherMAX®, Roundup PowerMAX®, Roundup PowerMAX® II, and Roundup PowerMAX® 3 herbicides with insecticides, fungicides, micronutrients or foliar fertilizers may result in reduced weed control, crop injury, reduced pest control or antagonism. Please refer to the product label, supplemental labeling or fact sheets published separately by Bayer for the Roundup® Brand Agricultural Herbicides tank mix recommendations.

Surfactant Use with Glyphosate Products in Glyphosate-Tolerant Crops

The addition of surfactants or additives containing surfactants to glyphosate spray solutions may increase the potential for crop injury.

When using Roundup WeatherMAX®, Roundup PowerMAX®, Roundup PowerMAX® II, or Roundup PowerMAX® 3 herbicides, NO additional surfactant is needed for optimal performance for applications in crops with Roundup Ready® Technology. Other available glyphosate products labeled for use in such crops may require the addition of surfactant or other additives to help optimize performance, except when used in Roundup Ready® Flex Cotton.

Identity Preserved Production

Some growers may choose to preserve the identity of their crops to meet specific markets. Examples of Identity Preserved (IP) corn crops include seed production, white, waxy or sweet corn, specialty oil or protein crops, food-grade crops and any other crop that meets specialty needs, including those with organic and non-biotechnology specifications. An example of an IP soybean crop is Vistive® Gold Soybeans with Roundup Ready 2 Yield® Technology. Growers of these crops assume the responsibility and receive the benefit for ensuring that their crop meets mutually agreed upon contract specifications.

Based on historical experience with a broad range of IP crops, the industry has developed generally accepted IP agricultural practices. These practices are intended to manage IP production to meet quality specifications and are established for a broad range of IP needs.

The accepted practice with IP crops is that each grower of an IP crop has the responsibility to implement any necessary processes. These processes may include sourcing seed appropriate for IP specifications; field management practices such as adequate isolation distances, buffers between crops, border rows and planned differences in maturity between adjacent fields that might cross-pollinate; and harvest and handling practices designed to prevent mixing and to maintain product integrity and quality. These extra steps associated with IP crop production are generally accompanied by incremental increases in cost of production and consequently the price of the goods sold.

General Recommendations for Management of Mechanical Mixing and Pollen Flow

For all crop hybrids or varieties that growers wish to identity preserve, or otherwise keep separated, the growers should take steps to prevent mechanical mixing. Growers should make sure all seed storage areas, transportation vehicles and planter boxes are cleaned thoroughly both before and after the storage, transportation or planting of the crop. Growers should also make sure all combines, harvesters and transportation vehicles used at harvest are cleaned thoroughly both before and after their use during harvest of the grain produced from the crop. Growers should also make sure all harvested grain is stored in clean storage areas where the identity of the grain can be preserved.

Self-pollinated crops, such as soybeans, do not present a risk of mixing by cross-pollination. If the intent is to use or market the product of a self-pollinated crop separately from general commodity use, growers should plant fields a sufficient distance from other crops to prevent mechanical mixing during harvest.

Growers planting cross-pollinating crops, such as corn or alfalfa, who desire to preserve the identity of these crops or to help minimize the potential for these crops to outcross with adjacent fields of the same crop kind, should use the same generally accepted BMPs to manage mixing that are used in any of the concurrently grown IP crops of the same kind.

It is generally recognized in the industry that a certain amount of incidental, trace-level pollen movement occurs, and it is not possible to achieve 100% purity of seed or grain in any crop production system. Several factors can influence the occurrence and extent of pollen movement. As stewards of biotechnology, growers are expected to consider these factors and talk with their neighbors about their cropping intentions.

Information that is more specific to the crop and area may be available from state extension offices.

Growers should consider the following factors that can affect the occurrence and extent of cross-pollination to or from other fields:

- **Cross-pollination potential.** Some plants are incapable of cross-pollinating, while others, like alfalfa, require cross-pollination to produce seed. Importantly, cross-pollination primarily occurs within the same species, like corn to corn, and the extent of any cross-pollination depends on distance from the source plant.
- **The amount of pollen produced within the field.** The pollen produced by the crop within a given field, known as pollen load, is typically high enough to pollinate all the plants in the field. Therefore, most of the pollen that may enter from other fields falls on plants that have already been pollinated with pollen that originated from plants within the field. In crops such as alfalfa, the hay cutting management schedule significantly limits or eliminates bloom, thereby restricting the potential for pollen and/or viable seed formation.
- **The existence and degree of overlap in the pollination period of crops in adjacent fields.** This will vary depending on the maturity of crops, planting dates and the weather. For corn, the typical pollen shed period lasts from 5 to 10 days for a particular field. Therefore, viable pollen from neighboring fields must be present when silks are receptive in the recipient field during this brief period to produce any grain with traits introduced by the out-of-field pollen.

- **Distance between fields of different varieties or hybrids of the same crop.** The greater the distance between fields, the less likely their pollen will remain viable and have an opportunity to mix and produce an outcross. For wind-pollinated crops, most cross-pollination occurs within the outermost few rows of the field. In fact, many white and waxy corn production contracts require the grower to remove the outer 12 rows (30 ft) of the field to minimize the impurities that could result from cross-pollination with nearby yellow dent corn. Furthermore, research has shown that, as fields become further separated, the incidence of wind-modulated cross-pollination drops rapidly. Essentially, in-field pollen has an advantage over the pollen coming from other fields for receptive silks because of its volume and proximity to silks.
- **The distance pollen moves.** How far pollen can travel depends on many environmental factors, including weather conditions during pollination, especially wind direction and velocity, temperature and humidity. For bee-pollinated crops, the grower's choice of pollinator species and apiary management practice may reduce field-to-field pollination potential. All these factors will vary from season to season, and some factors from day to day and from location to location.
- **For wind-pollinated crops, the orientation and width of the adjacent field in relation to the dominant wind direction.** Fields located upwind during pollination will show dramatically lower cross-pollination for wind-pollinated crops, like corn, compared to fields located downwind.

Coexistence of Biotechnology Cropping Systems with Other Agricultural Production Systems

Coexistence in agricultural production systems and supply chains is well established and well understood. A variety of agricultural systems around the world have coexisted successfully for many years.

Standards and best practices were established decades ago and have continually evolved to deliver high-purity seed and grain to support production, distribution and trade of products from various agricultural systems. For example, production of similar commodities such as field corn, sweet corn and popcorn or oilseed rape varieties with low erucic acid content for food use and high erucic acid content for industrial uses has occurred successfully in close proximity for many years.

The introduction of biotechnology crops generated renewed discussion focused on the coexistence of biotechnology cropping systems with conventional cropping systems and organic production. These discussions have primarily focused on the potential marketing impact of the introduction of biotechnology products on other systems. The health and safety of biotechnology products are not issues because their food, feed and environmental safety are demonstrated before they are allowed to enter the agricultural production system and supply chain.

The coexistence of conventional, organic and biotechnology crops has been the subject of several studies and reports. These studies and reports conclude that coexistence among biotechnology and non-biotechnology crops is readily achievable and is occurring.

It is recommended that coexistence strategies be developed on a case-by-case basis while considering the diversity of products currently in the market and under development, the agronomic and biological differences in the crops themselves and variations in regional farming practices and infrastructure. Any coexistence strategy is designed to meet market requirements and should be developed using current science-based industry standards and best management practices. Those strategies must be flexible, facilitate options and choice for the grower and the food and feed supply chain and be capable of being modified as changes in markets and products warrant.

Successful coexistence of all agricultural systems depends on communication, cooperation, flexibility and mutual respect for each system among growers. Agriculture has a history of innovation and change, and growers have generally adapted to new approaches or challenges by utilizing appropriate strategies, farm management practices and new technologies.

The responsibility for implementing best practices to satisfy specific marketing standards or certification lies with the growers who are growing a crop to satisfy a particular market. These growers are inherently agreeing to employ practices that are appropriate to ensure the integrity and marketability of their crops. In each case, the growers are seeking to produce a crop that is supported by a special market price and consequently assume responsibility for satisfying the market specifications to receive that premium. That said, each grower needs to be aware of the planting intentions of his or her neighbors to gauge the need for appropriate BMPs.

Treated Seed Best Management Practices and Requirements

The use of seed-applied treatments by growers can be an effective tool to protect seeds for a strong, healthy start. Seed treatments can be precisely applied to help shield seeds from insects and diseases that exist in the soil during a seed's early developmental stages.

Below are some recommended BMPs and requirements for the handling and planting of treated seed:

- Always follow the directions on seed bags and/or tags for proper storage, handling, planting and disposal practices, based on the specific treatments applied to the seed.
- Always follow personal protective equipment (PPE) requirements on seed bags and/or tags.
 - PPE generally includes wearing long sleeves, long pants, shoes, socks and chemical-resistant gloves of a defined material/thickness.
 - Always check the seed bag and/or tag for any additional PPE requirements and assess each activity to determine if additional PPE is appropriate to protect workers (e.g., when cleaning the planter).
- During planting, be aware of the presence of honey bee hives, or crops or weeds in the flowering stage within or adjacent to the field that could attract pollinators.
 - Eliminate flowering plants and weeds in and around the field prior to planting.
 - Fill the planter at least 10 yards inside the field to be planted.
- Minimize dust by:
 - Using advanced seed flow lubricants that minimize dust, such as Fluency Agent Advanced. Learn more at crops.bayer.com/seedgrowth/fluency-agent-advanced.
 - Avoiding off-site movement of dust from treated seeds during planting or when opening seed containers by observing wind speed and direction.
 - Avoiding shaking the bottom of the treated seed bag when filling the planter to reduce the release of dust that could have accumulated during transport.
- For pneumatic planters, direct the air exhaust downward toward the soil surface, if possible, to decrease the potential for dust drift.
- Collect and properly dispose of any spilled treated seed to minimize exposure to people, livestock, wildlife and the environment. For more information on treated seed stewardship and handling spills, please visit this site: seed-treatment-guide.com/wp-content/uploads/2018/03/Treated-Seed-Stewardship-for-Handling-Spills.pdf.
- Return leftover seed to its original containers if the seed is intended for storage and use at a later date.
- Completely clean any equipment that has held treated seed of remnant seed and dust and dispose of such remnant seed appropriately. There is zero tolerance for treated seed kernels in the commodity grain channel.
- Refer to seed bags and/or tags for the annual maximum amount of active ingredient(s) that can be applied to each acre. Consider all foliar, furrow, treated seed, plant back, rotational crop and seed disposal contributors that include the same active ingredient(s) and ensure they do not cumulatively exceed the maximum amount.

Planting may be an allowable option to dispose of left-over treated seeds. But when that option is chosen, a grower must follow the product guidelines and adhere to any annual maximum allowances as well as grazing and plant-back restrictions found on the seed bag and/or tag. If planting treated seed, please refer to the specific product label to determine if there are any planting restrictions. Additionally, if disposing of rinse water or applied foliar applications of the same active ingredient on the same acreage intended for over-seeding, calculate the total load of active ingredient to ensure that the maximum amount applied per year is not exceeded. Before over-seeding, confirm that it is allowed in the state and county of proposed over-seeding.

For more information, please refer to the Guide to Seed Treatment Stewardship, produced by the American Seed Trade Association (ASTA) and Crop Life America (CLA) at seed-treatment-guide.com.



Fluency Agent Advanced

Fluency Agent Advanced is a seed lubricant for corn and soybeans from Bayer. It is a replacement for talc, graphite and talc/graphite blended seed lubricants.



Fluency Agent Advanced is an improved version of the original Fluency Agent. It has been optimized for easier handling, including enhanced uniformity and reduced residue buildup. These characteristics allow for improved measuring, pouring and mixing

of product and less residue in the seed hopper.

Fluency Agent Advanced reduces the amount of insecticide active ingredient released in treated seed dust during planting by more than 88%¹ as compared to talc, therefore reducing the risk of exposure to non-target insects, including bees.

To ensure that grower practices help promote agricultural sustainability, we encourage growers to follow these tips:

- C** Communicate planting activities to neighboring beekeepers when practical and be aware of beehives adjacent to the planting area.
- A** Be aware of wind speed and direction during planting, particularly in areas with flowering crops.
- R** Reduce risk to pollinators by eliminating or reducing flowering weeds in fields when practical.
- E** Ensure that seed is planted correctly. To help protect the environment, clean planters and seed boxes to minimize dust release and ensure that treated seed is planted at the proper depth.



¹ When using a deflector and used in accordance with label directions.



Establishing Healthy Pollinator Habitats

Pollinators are essential to agricultural systems. By providing high-quality habitats for pollinators such as bees and monarch butterflies, you provide benefits to your farm by increasing the diversity of pollinators and other beneficial insects in your area. These benefits contribute to productive and sustainable farmscapes.

In addition, consider establishing diverse habitats that have a mixture of wildflowers, milkweed and other beneficial plants to supply nutrition and breeding areas for a variety of pollinators, including bees, butterflies and birds. Plant these habitats in non-cultivated areas such as conservation lands/buffers, ditches or roadsides. Follow label directions intended to minimize spray drift to non-target plants that provide habitat for pollinators and other non-target organisms.

Every region is different. To get started, check out the resources at farmersformonarchs.org.

Bayer is working with experts in biodiversity, including academics, growers, conservation groups and government agencies across the United States, to improve the habitat and ecosystem for the monarch butterfly and pollinators such as honey bees. We work with the Bee & Butterfly Habitat Fund, Monarch Watch, National Fish and Wildlife Foundation, Keystone Policy Center Monarch Collaborative, Iowa Monarch Conservation Consortium, Pheasants Forever and Missourians for Monarchs Collaborative, among others.

Honey Bee Health Information

From time to time, claims circulate that insect-protected biotechnology crops harm bees. The insecticidal proteins produced by the currently available insect-protected crops are derived from a common soil bacterium, and Bayer screens all the proteins we use for toxicity to honey bees and other non-target organisms. None of the proteins have provided any evidence of harm in either short- or long-term testing with both adult and larval honey bees. Likewise, there are no credible reports of harm caused by insect-protected biotechnology crops on honey bees.

Overwinter losses of honey bee colonies are an ongoing concern. There are many possible causes, with the Varroa mite posing the largest single threat. Additionally, parasites, diseases, poor nutrition, transportation stress and pesticides (including those used to control mites and diseases) are often cited as challenging honey bee health.

Bayer has many efforts underway to improve honey bee health:

- We established seed treatment BMPs to manage risks to beneficial insects such as bees.
- We contribute to and support stewardship outreach programs to growers and applicators to protect honeybees and other pollinators in programs. Check out the BeSure! program at growingmatters.org. Healthy Hives is a multiyear, \$1.8 million research initiative well on its way to finding measurable and tangible solutions for improving U.S. honey bee colony health. Read more at bayer.com/en/us/healthy-hives.
- We actively support collaborations with the honey bee industry, USDA and university researchers, people engaged in pollinator-dependent agriculture and corn and soybean growers to identify ways to protect and improve honey bee health. In one such collaboration with the Honey Bee Health Coalition, we're joining growers, universities, conservation groups and others because the issue of honey bee health is too big, too important and too complex for one company or group—we have to work together. For more information, please visit the organization's website, honeybeehealthcoalition.org.



Bayer Carbon Program

Powered by the Climate FieldView™ Platform

ForGround by Bayer is now offering a carbon program where eligible farmers in qualifying areas can earn income for adopting strip-till, no-till and cover crops practices.

Reduced tillage and cover cropping can be powerful ways to help support your yield potential and nutrient management over time, leaving healthier soil for future generations. The Bayer Carbon Program was built to be a simple and straightforward way for farmers to take advantage of potential new income streams in the carbon market.

To learn more about this important program, or to see if your fields qualify, go to [BayerForGround.com/Carbon](https://bayerforground.com/Carbon). You can also learn more about additional benefits through ForGround, including agronomic planning support and discounts from input and machinery providers.

If you have any questions regarding the Bayer Carbon Program, reach out to us at <https://bayerforground.com> or call **1-833-877-7934**.





Bayer Corn Technologies for 2024



Short stature corn hybrids developed through traditional breeding in the Preceon™ Smart Corn System were developed to be around 1/3 shorter than traditional corn hybrids. With less height to catch wind,* the short stature corn hybrids have increased tolerance to high winds and other challenging weather conditions. Farmers can see a reduced risk of yield loss resulting from lodging, greensnap and goose-necking. Initial trials have also shown potential for greater soil exploration and depth in locations with overall robust root growth,* however the effects of this characteristic have yet to be fully understood.



Products with SmartStax® PRO with RNAi Technology contain Cry1A.105, Cry2Ab2, Cry1F, Cry3Bb1, Cry34Ab1 and Cry35Ab1 from *Bacillus thuringiensis* (*B.t.*) and DvSnf7 double stranded RNA. Together this technology controls European corn borer, southwestern corn borer, southern cornstalk borer, fall armyworm, stalk borer, lesser corn stalk borer, sugarcane borer, black cutworm, western corn rootworm, northern corn rootworm and Mexican corn rootworm and controls or suppresses corn earworm. Products with SmartStax® PRO Technology also contain Roundup Ready® 2 Technology and LibertyLink® Technology that provide tolerance to in-crop applications of labeled glyphosate herbicides and glufosinate herbicides, respectively, when applied according to label directions.



Products with SmartStax® Technology contain Cry1A.105, Cry2Ab2, Cry1F, Cry3Bb1, Cry34Ab1 and Cry35Ab1 from *B.t.* that together control European corn borer, southwestern corn borer, southern cornstalk borer, fall armyworm, stalk borer, lesser corn stalk borer, sugarcane borer, black cutworm, western corn rootworm, northern corn rootworm and Mexican corn rootworm and control or suppress corn earworm.^{1,2} Products with SmartStax® Technology also contain Roundup Ready® 2 Technology and LibertyLink® Technology that provide tolerance to in-crop applications of labeled glyphosate herbicides and glufosinate herbicides, respectively, when applied according to label directions.



Products with Trecepta® Technology contain Cry1A.105, Cry2Ab2 and Vip3Aa20 from *B.t.* that together control European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, stalk borer, lesser cornstalk borer, sugarcane borer, beet armyworm, true armyworm, black cutworm, western bean cutworm, and dingy cutworm.¹ Products containing this technology also contain Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled glyphosate herbicides when applied according to label directions.



Products with VT4PRO™ with RNAi Technology contain Cry1A.105, Cry2Ab2, Cry3Bb1, VIP3Aa20 from *B.t.* and DvSnf7 double-stranded RNA that together control European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, stalk borer, lesser cornstalk borer, sugarcane borer, beet armyworm, true armyworm, black cutworm, western bean cutworm, dingy cutworm, western corn rootworm, northern corn rootworm, and Mexican corn rootworm.¹ Products containing this technology also contain Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled glyphosate herbicides when applied according to label directions.



Bayer Corn Technologies for 2024



Products with VT Triple PRO® Technology contain Cry1A.105, Cry2Ab2 and Cry3Bb1 from *B.t.* that together control European corn borer, southwestern corn borer, southern cornstalk borer, fall armyworm, stalk borer, lesser corn stalk borer, sugarcane borer, western corn rootworm, northern corn rootworm, and Mexican corn rootworm and control or suppress corn earworm.^{1,2} Products with VT Triple PRO® Technology also contain Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled glyphosate herbicides when applied according to label directions.



Products with VT Double PRO® Technology contain Cry1A.105 and Cry2Ab2 from *B.t.* that together control European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, stalk borer, lesser cornstalk borer and fall armyworm, and control or suppress corn earworm.¹ Products with VT Double PRO® Technology also contain Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled glyphosate herbicides when applied according to label directions.



Roundup Ready® Corn 2 products and corn with Roundup Ready® 2 Technology contain in-plant tolerance to glyphosate, the active ingredient in Roundup® Brand Agricultural Herbicides: SmartStax® PRO Corn, SmartStax® PRO RIB Complete® corn blend, SmartStax® Corn, SmartStax® RIB Complete® corn blend, VT Double PRO® Corn, VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Double PRO® Corn, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, VT Triple PRO® Corn, VT Triple PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® Corn, DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend, VT4PRO™ Corn, VT4PRO™ RIB Complete®, Trecepta® Corn, Trecepta RIB Complete® corn blend.



Products with DroughtGard® Hybrids Technology contain cold shock protein B from *Bacillus subtilis*, a protein that can mitigate the effects of drought stress: DroughtGard® Hybrids with VT Double PRO® Corn, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® Corn, and DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend.



The Acceleron® portfolio delivers coverage on four fronts: fungicides, insecticides, nematicides and bio-enhancers to help protect your seed investment against diseases, insects, nematodes, as well as moisture or nutrient stress. For more information, consult your local retailer or visit cropsscience.bayer.us/seedgrowth/acceleron.



RIB Complete® corn blend products have refuge seed in the bag along with traited seed, resulting in a refuge configuration that is interspersed within the field: SmartStax® PRO RIB Complete® corn blend, SmartStax® RIB Complete® corn blend, Trecepta® RIB Complete® corn blend, VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, VT Triple PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend, and VT4PRO™ RIB Complete® corn blend.

¹Based upon root observations from 2016-2022 Bayer internal trials both in greenhouse and limited field environments (6 locations, 3 states) comparing limited genetics of short stature vs standard height corn products.

²Routine applications of insecticides to control these insects under typical growing conditions and infestation levels are usually unnecessary for these products.

³Applications of soil-applied insecticides (i.e., application of an insecticide to the soil surface, in furrows and/or incorporated into the soil) are not recommended for control of corn rootworm except under limited circumstances and under consultation with an extension agent, crop consultant or other local experts. Soil-applied insecticides should not be necessary for corn rootworm control with this product.

SmartStax® PRO RIB Complete® corn blend, SmartStax® RIB Complete® corn blend, Trecepta® RIB Complete® corn blend, VT Double PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend, VT Triple PRO® RIB Complete® corn blend, DroughtGard® Hybrids with VT Triple PRO® RIB Complete® corn blend, and VT4PRO™ RIB Complete® corn blend, require a 20% planted, structured refuge in the Cotton-Growing Area. See map on page 25 of this section.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between the recommendations in this guide and the applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in a Roundup Ready® 2 Technology System.

Products with Roundup Ready® 2 Technology enable flexibility, broad-spectrum weed control and proven crop safety. Growers can select the weed control program that best fits the way they farm and provides them the greatest benefit. Options include the use of a residual herbicide with Roundup® brand glyphosate agricultural herbicides and tank mixing other herbicides with Roundup® brand agricultural herbicides.

Corn yield is very sensitive to early season weed competition. Weed control systems must provide growers the opportunity to control weeds before they become competitive.

Roundup Ready® 2 Technology provides a mechanism to control weeds at planting and once they emerge. Failure to control weeds with the right rate, at the right time and with the right herbicide product can lead to increased weed competition, weed escapes, the potential for selecting herbicide-tolerant weeds and possible decreased yields. Use a diverse set of weed management tools, including multiple effective herbicides with different mechanisms of action alone or in tank mixes, as appropriate, with Roundup® brand agricultural herbicides, based on the weed spectrum in the field and according to label directions.

Additional Information

Various weed biotypes are known to be resistant to glufosinate, glyphosate and dicamba. For the current weed control recommendations for herbicide-resistant weed biotypes, please call 1-866-992-2937. A complete list of specimen labels can be found at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling 1-866-992-2937 or by contacting your State Pesticide Lead Agency for more information.

Recommendations

Start clean with burndown herbicide(s), residual herbicide(s) or tillage. Early season weed control is critical to yield.

Apply pre-emergence residual herbicides such as Harness® Xtra, Degree Xtra®, TriVolt® herbicide or other residual herbicides at the application rate specified on the product label.

- Soil residual herbicides are critical to control emerging glyphosate-resistant weeds, such as pigweed.
-

Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected. Or, apply a pre-emergence residual herbicide at the appropriate application rate tank mixed with a minimum of 22 fl oz/acre of Roundup WeatherMAX® herbicide, Roundup PowerMAX®, or Roundup PowerMAX® II, or 20 fl oz/acre of Roundup PowerMAX® 3 herbicide in-crop before weeds exceed 4 inches in height.

Follow with a post-emergence in-crop application of Roundup PowerMAX® herbicide at a minimum of 22 fl oz/acre, or 20 fl oz/acre of Roundup PowerMAX® 3 herbicide, for additional weed flushes before they exceed 4 inches in height.

Roundup PowerMAX® and Roundup PowerMAX® 3 herbicides may be tank mixed with other herbicides for post-emergence weed control as specified on the product labels.

Equipment should be cleaned before moving from field to field to minimize the spread of weed seed.

Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.



Integrated Pest Management (IPM)

Sustainable Agriculture

Bayer insect-protected corn products are highly compatible with the goals of IPM and sustainable agriculture. Sustainability of corn agricultural systems is enhanced when growers follow recommended IPM practices, including cultural and biological control tactics, pest sampling and appropriate use of pest thresholds for management practices. These latter measures are not only important for non-insect-protected refuge acres but are equally important for detecting and controlling non-target pests that exceed established thresholds on insect-protected crops.

Pests Not Controlled

Specific insect-protected corn products offer control against several of the key lepidopteran and coleopteran insect pests but will not control all insect pests in corn. Therefore, it is important to understand that, in some cases, severe infestations of target and/or non-target insects may require additional control measures/treatments. Fields should be scouted regularly, especially during periods of heavy or sustained pest presence. Consult local IPM monitoring guidelines to identify insects that should be routinely monitored and for recommended controls and thresholds. When insecticide treatments are required, select products that have the least impact on beneficial insects. Consult your local crop adviser or extension specialist for the most up-to-date information.

An IPM Checklist

Pest scouting:

- Use appropriate scouting techniques and treatment decisions.

Insecticide applications:

- Select insecticide treatments that have minimal negative impact on beneficial insects, whenever possible. These insects are conserved by insect-protected crops and can contribute to insect pest control.
- Rotate insecticide mode of action or use products with multiple modes of action to help reduce the risk of insect pests developing chemical resistance. For more information, visit [irac-online.org/modes-of-action/](https://www.irac-online.org/modes-of-action/).

Cultural practices:

- Select cultivars well-adapted to your setting, giving appropriate attention to the impact of crop maturity and timing of harvest on pest severity.
- Use recommended cultural control methods to reduce pest overwintering; destroy crop promptly after harvest and use other soil management practices to reduce overwintering insects.

Corn Refuge Requirements

Growers must read the IRM Grower Guide prior to planting for information on required IRM.

The corn product IRM Grower Guide is located on the seed bag tag.

Resistance naturally evolves to many pest control tactics. The risk of insect pests developing resistance is real but may be reduced with proper planning. The best way to preserve the benefits and insect protection of this technology is to develop and implement an IRM plan.

A key component of any IRM plan is a refuge.

A refuge is a block or strip of corn that does not contain a plant-incorporated protectant such as an insect protection technology for controlling targeted insect pests, or the refuge can be included in an EPA-approved seed blend product provided by qualified seed producers/conditioners licensed by Bayer. There are no requirements for a separate structured refuge for approved seed

blend products when planted in the U.S. Corn-Growing Area (as defined on page 25) because the refuge seed is contained within the bag/container. Bayer does not recommend the planting of seed blend products in the Cotton-Growing Area (as defined on page 25). If planted in a cotton area, an additional 20% separate structured refuge is required.

The primary purpose of a refuge is to maintain a population of insect pests that are not exposed to plant-incorporated protectants such as insect protection proteins.

The lack of exposure to insect protection proteins allows susceptible insects emerging from the refuge to mate with the rare resistant insects that may emerge from the insect-protected crop. Susceptibility to insect protection technology would then be passed to their offspring, helping to preserve the long-term effectiveness of insect

protection technologies. To help reduce the risk of insects developing resistance, the refuge should be planted with a similar non-insect-protected product (e.g., a similar relative maturity), as close as possible and at the same time as, the crop containing insect protection technologies.

As a condition of registration for insect-protected products required by the EPA, seed companies are required to conduct IRM compliance assessments during the growing season to ensure grower compliance.

Failure to follow IRM requirements and properly plant a refuge may result in the loss of access to Bayer Crop Science insect-protected technologies. Do your part to ensure these technologies are preserved by fully cooperating in refuge management. Continued availability of insect-

protected technologies depends on grower compliance with EPA product registration and label requirements. With an effective IRM plan in place, growers will continue to benefit from effective and consistent insect protection and top-yield potential found in crops containing these technologies.

Refuge Planting

- Grower mixing of non-insect-protected seed with insect-protected corn seed is not permitted. However, non-insect-protected seed can be included in an EPA-approved seed blend product if provided by qualified seed producers/conditioners licensed by Bayer.
- Plant the structured refuge at the same time as the insect-protected corn seed to help ensure that plant development is similar among products.
- To avoid inadvertent mixing of seed in the planting process, be sure to clean all seed out of hoppers when switching from non-insect-protected seed to insect-protected corn seed or vice versa.
- Adjacent and separate refuge fields must be planted and managed by the same grower.
- If insect-protected corn seeds are planted on rotated ground, then the corn refuge can be planted on either continuous corn ground or on rotated ground.
- If insect-protected corn seeds are planted on continuous corn ground, then the corn refuge also must be planted on continuous corn ground.

Requirements by Growing Area

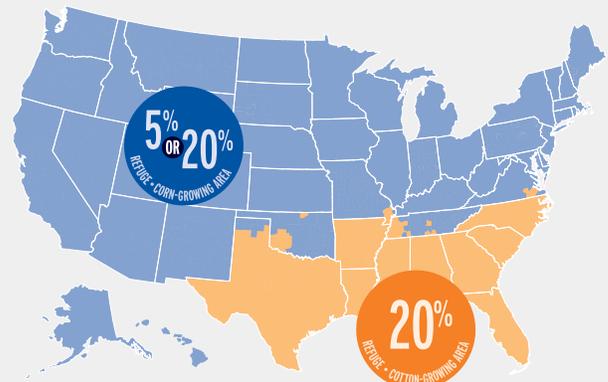


The following states and counties are within the **Corn-Growing Area**. The blue circle structured refuge requirements apply to non-refuge in a bag insect-protected corn products grown in this area.

Alaska
 Arizona
 California
 Colorado
 Connecticut
 Delaware
 Hawaii
 Idaho
 Illinois
 Indiana
 Iowa
 Kansas
 Kentucky
 Maine
 Maryland
 Massachusetts
 Michigan
 Minnesota

Missouri—*all counties except Dunklin, New Madrid, Pemiscot, Scott & Stoddard*
 Montana
 Nebraska
 Nevada
 New Hampshire
 New Jersey
 New Mexico
 New York
 North Dakota
 Ohio
 Oklahoma—*all counties except Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman & Washita*
 Oregon
 Pennsylvania
 Rhode Island
 South Dakota

Tennessee—*all counties except Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby & Tipton*
 Texas—*only the counties of Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts & Sherman*
 Utah
 Vermont
 Virginia—*all counties except Dinwiddie, Franklin City, Greenville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey & Sussex*
 Washington
 West Virginia
 Wisconsin
 Wyoming



The following states and counties are within the **Cotton-Growing Area**. The orange circle structured refuge requirements apply to insect-protected corn products grown in this area.

Alabama
 Arkansas
 Florida
 Georgia
 Louisiana
 Mississippi
 Missouri—*only the counties of Dunklin, New Madrid, Pemiscot, Scott & Stoddard*
 North Carolina

Oklahoma—*only the counties of Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman & Washita*
 South Carolina
 Tennessee—*only the counties of Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby & Tipton*

Texas—*all counties except Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts & Sherman*
 Virginia—*only the counties of Dinwiddie, Franklin City, Greenville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey & Sussex*

Corn Structured Refuge Requirements

Follow all pesticide label directions. Please see page 25 for Growing Area descriptions.

Product	Corn-Growing Area Structured Refuge	Cotton-Growing Area Structured Refuge	Common or Single-Pest Configuration Options		
			Within	Adjacent	1/2 Mile
SmartStax	5%	20%	●	●	*

Under typical growing conditions and infestation levels for products planted with SmartStax® Technology, routine applications of insecticides to control pests are usually unnecessary. However, the refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides if the population of one or more target lepidopteran pests in the refuge exceeds economic thresholds.¹ The refuge can also be protected from corn rootworm damage by an appropriate seed treatment or soil insecticide; but insecticides labeled for adult corn rootworm control must be avoided in the refuge during the period of corn rootworm adult emergence. If insecticides are applied to the refuge for control of corn rootworm adults, the same treatment must also be applied in the same timeframe to the SmartStax® Corn field. SmartStax® Technology contains Roundup Ready® 2 Technology and LibertyLink® herbicide-tolerance traits, but your refuge may or may not. Select an appropriate herbicide for your refuge to avoid crop damage.

SmartStax PRO RIB COMPLETE WITH RNAi TECHNOLOGY	NO structured refuge required	Not recommended for the Cotton-Growing Area. If planted, an additional 20% structured refuge is required.	●	●	●
SmartStax RIB COMPLETE	NO structured refuge required	Not recommended for the Cotton-Growing Area. If planted, an additional 20% structured refuge is required.	●	●	●
VT4 PRO RIB COMPLETE WITH RNAi TECHNOLOGY	5%	20%	●	●	●
Trecepta CORN	5%	20%	●	●	●

The refuge can be treated with a non-*B.t.* foliar-applied insecticide for control of lepidopteran pests (e.g., corn borer), if pest pressure reaches an economic threshold for damage.¹ Microbial *B.t.* insecticides must not be applied to the refuge corn.

VT4 PRO RIB COMPLETE	NO structured refuge required	Not recommended for the Cotton-Growing Area. If planted, an additional 20% structured refuge is required.	●	●	●
Trecepta RIB COMPLETE CORN	NO structured refuge required	Not recommended for the Cotton-Growing Area. If planted, an additional 20% structured refuge is required.	●	●	●

Cotton-Growing Area: The 20% separate structured refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides if the population of one or more target pests of Trecepta® RIB Complete® corn blend exceeds economic thresholds in the refuge. Microbial *B.t.* insecticides must not be applied to the refuge corn. In addition, refuge can be protected from corn rootworm damage by appropriate seed treatment or soil insecticide.

VT Triple PRO DroughtGard RIB COMPLETE HYBRIDS VT Triple PRO	20%	20%	●	●	**
--	-----	-----	---	---	----

The refuge can be treated with a soil-applied or seed-applied insecticide to control corn rootworm larvae and other soil pests. The refuge can also be treated with a non-*B.t.* foliar applied insecticide for control of late-season pests (e.g., corn borer), if pest pressure reaches an economic threshold for damage.¹ However, if corn rootworm adults are present at the time of foliar application, then the VT Triple PRO® corn field must be treated in a similar manner.

VT Triple PRO DroughtGard RIB COMPLETE HYBRIDS VT Triple PRO RIB COMPLETE	NO structured refuge required	Not recommended for the Cotton-Growing Area. If planted, an additional 20% structured refuge is required.	●	●	●
---	-------------------------------	---	---	---	---

Cotton-Growing Area: The 20% separate structured refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides if the population of one or more target pests of Trecepta® RIB Complete® corn blend exceeds economic thresholds in the refuge. Microbial *B.t.* insecticides must not be applied to the refuge corn. In addition, refuge can be protected from corn rootworm damage by appropriate seed treatment or soil insecticide.

VT Double PRO DroughtGard RIB COMPLETE HYBRIDS VT Double PRO	5%	20%	●	●	●
--	----	-----	---	---	---

The refuge can be treated with a non-*B.t.* foliar-applied insecticide for control of lepidopteran pests (e.g., corn borer), if pest pressure reaches an economic threshold for damage.¹ Microbial *B.t.* insecticides must not be applied to the refuge corn.

VT Double PRO DroughtGard RIB COMPLETE HYBRIDS VT Double PRO RIB COMPLETE	NO structured refuge required	Not recommended for the Cotton-Growing Area. If planted, an additional 20% structured refuge is required.	●	●	●
---	-------------------------------	---	---	---	---

Cotton-Growing Area: The 20% separate structured refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides if the population of one or more target pests of VT Double PRO® RIB Complete® corn blend exceeds economic thresholds in the refuge.¹ Microbial *B.t.* insecticides must not be applied to the refuge corn. In addition, refuge can be protected from corn rootworm damage by appropriate seed treatment or soil insecticide.

* = 1/2 mile option for SmartStax® Corn is only available to growers in the following states: AK, AL, AR, AZ, CA, CT, DE, FL, GA, HI, IL, LA, MA, MD, ME, MS, MT, NC, NH, NJ, NM, NV, NY, OR, PA, RI, SC, TN, UT, VA, VT, WA, WV, WY.

** = 1/2 mile option for VT Triple PRO® Corn is only available to growers planting separate refuge areas for corn borers (this option is not available for a separate corn rootworm refuge area).

¹ Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., extension service agents and crop consultants).

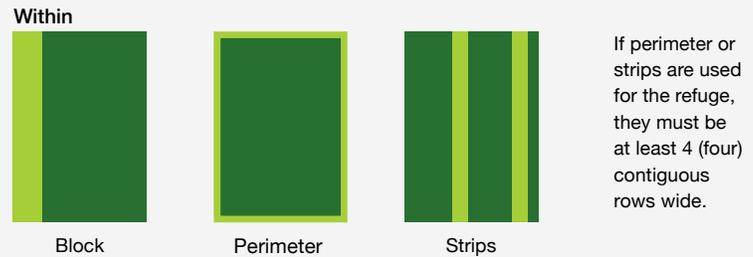
Corn Structured Refuge Requirements

Common and Single-Pest Structured Refuge Configuration Options

- Insect-protected Technology
- Non-insect protected Refuge (i.e., Roundup Ready® Corn 2 or conventional corn)
- Designates road, ditch, path, etc.

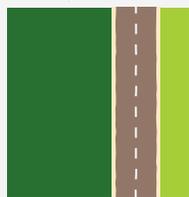
Sample configurations shown are for a 20% refuge

The graphic depictions of refuge configurations in this overview are offered merely as examples to growers and are not necessarily drawn to scale.

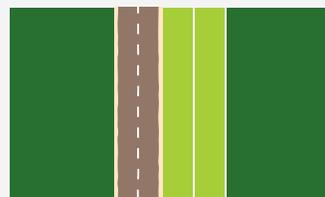


If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.

OR Adjacent



Adjacent



Within adjacent field

OR 1/2 Mile Option



← ≤ 1/2 mile →

1/2 mile option available for limited products and in limited areas — see footnotes on page 26 for details.

How to Calculate a Separate Structured Refuge



Refer to this diagram for the example below.

- A** Total Corn Acres*
- B** Refuge Acres
- C** Insect-protected Acres
- %** Percent of Required Refuge— 5% or 20%
Based on total corn acres

As part of our commitment to enhancing grower productivity, growers can access an IRM corn refuge look-up tool at iwilltakeaction.com/insects/bt-refuge-lookup-tool/.

Example below is for a 20% refuge product.

START with the **TOTAL** number of corn acres you want to plant in an area.

Multiply by the **PERCENT** of refuge required for the insect-protected trait.

This is your minimum **REFUGE ACRES**.

Example	A	200	X	%	20%	=	B	40 ✓
Your Field			X			=		

Next, subtract your refuge acres from your total corn acres.

This is your maximum **INSECT-PROTECTED ACRES**.

Example	A	200	-	B	40	=	C	160
Your Field			-			=		

*Includes all corn acres that are in field or adjacent to each other and will be allocated to the insect-protected product and its associated refuge.

Corn Rootworm Best Management Practices

Bayer has implemented a comprehensive program for management of corn rootworm (CRW), including a series of best management practices, to better assist growers on every field where they reported unexpected damage.



We encourage growers to follow recommended IPM practices, including cultural control tactics, scouting and the appropriate use of pest thresholds and sampling.

If you are not seeing high corn rootworm pressure in a field and you are planting a single mode of action product such as VT Triple PRO® Corn, Bayer recommends updating your IPM program to include

regular scouting to determine if the addition of an insecticide or other IPM practice is necessary.

These BMPs provide practical solutions to reduce rootworm populations, limit CRW damage and enable insect resistance management.

1 Plant the required refuge

2 Rotate crops

Rotate to a crop that is not a CRW host, such as soybeans, at least every third year if any of the following are applicable:

- In a long-term continuous corn system.
- CRW populations are high.
- Experiencing problems with CRW trait performance.

In areas where rotational-resistant CRW variants exist, such as extended diapause eggs or adult beetles laying eggs in soybean, CRW management options may be needed the following year.

3 Rotate traits

- Use insect-protected products with multiple modes of action for CRW control whenever possible.
- If using a product with multiple modes of action for CRW control is not an option, rotate to a different insect-protected product that controls CRW.

4 Use non-insect-protected or non-CRW-protected corn

- Use a non-insect-protected product with insecticide.

5 Manage CRW with insecticides

Adult CRW Management Considerations

- Scout fields for CRW adults during silk stage (typically July and August) as adult CRW beetles feed on corn silks and may reduce yield.
- Foliar sprays may be an option if CRW beetle populations reach an economic threshold for damage (~ 0.75 beetle per plant).*
- Follow university extension service or local crop consultant recommendations for products, rates and proper timing of adult spray applications for reducing CRW beetle populations.
- Multiple sprays may be necessary.

Larval CRW Management Considerations

- The application of an insecticide to the soil surface, in furrows and/or incorporated into the soil (referred to as “soil applied insecticide,” “soil insecticide” or “SAI”) is not recommended for control of CRW in insect-protected corn except under limited circumstances.
- Consult with extension, crop consultants or other local experts for recommendations when considering a combination of CRW-protected traits and soil applied insecticides.
- SAIs should not be necessary for CRW control with pyramided CRW-traited insect-protected corn.

*Culy, Edwards & Cornelius. 1992. Journal of Economic Entomology 85: 2440-2446.

Acceleron® Corn Offerings



The Acceleron® Brand portfolio helps protect your seed investment against diseases, insects, nematodes, and moisture or nutrient stress.

Fungicides

Some key diseases cost growers 225M bushels of corn per year. Our exclusive combinations of fungicides protect against these top diseases, including *Fusarium*, *Pythium*, *Rhizoctonia solani* and *Colletotrichum graminicola*.

Insecticides

Early season corn insects feed on seeds and seedlings, which can cause delayed emergence, stand loss, plant injury and stunting. Our insecticides control 15 early season pests that cause significant damage to corn crops across the U.S., including wireworm, seed corn maggot, white grub, grape colaspis and black cutworm.

Nematicides

Nematodes cost an estimated 10.2% yield loss in corn.¹ They pierce and infect roots, causing a loss of nutrients and water while opening the door for secondary issues. Poncho® Votivo® Seed Treatment has been shown to provide broad-spectrum protection against plant-parasitic nematodes for up to 60 days after planting.

New to the Acceleron offerings for 2024: Acceleron N-314 Seed Treatment,² the first dual mode of action chemistry and biological product for corn that provides broad spectrum efficacy protecting against yield robbing nematodes.

Bio-Enhancers

Nutrient and moisture deficiencies can impair root growth, making it even harder for plants to get the nutrients and moisture they need. Bio-enhancers for corn make nutrients available to plants, helping maximize yield potential. Although benefits vary by crop, some products can also enhance functional root volume and increase nutrient uptake, protecting plants from moisture or nutrient stress.

Additional Offerings

- The BioRise® Corn Offerings complement our lineup of fungicides, insecticides and nematicides. 2016 and newer product classes are treated with BioRise® 360 ST.³

For more information, please consult your local retailer or visit crops.science.bayer.us/seedgrowth/acceleron.

For important information related to stewardship and best management practices for seed treatments, refer to page 16 of this Technology Use Guide.

¹Nationwide estimated loss. Ferris, Howard. "Nematodes and Plant Damage." University of California, 1 Oct. 2015. Web.

²Acceleron N-314 Seed Treatment will be available on all VT4PRO™ with RNAi Technology and SmartStax® PRO with RNAi Technology trait offerings on Bayer owned seed brands for the 2024 season.

³BioRise® Corn offerings can vary by seed company.

2024 Corn Offerings



BASIC

FUNGICIDES

Two modes of action providing enhanced protection against soil-borne and seedborne diseases, including *Fusarium*, *Rhizoctonia solani* and *Pythium*.

INSECTICIDES ^[1]

Controls over 15 corn insect pests and protects against damage from early season pests, such as wireworm, seedcorn maggot, white grub, grape colaspis and black cutworm. Standard insecticide rate of 0.50 mg a.i./seed for products containing Clothianidin.

NEMATICIDES ^[1]

Protection against damage from a wide range of nematode species. Refer to your 2024 seed price card for availability and pricing.

BIO-ENHANCERS

+ BioRise® Corn Offering ^[2]

Designed to increase functional root volume, as well as water and nutrient uptake through enhanced mycorrhizal colonization.

[1] Insecticide and nematicide offerings will vary by trait and class. Refer to price card, bag tag or bag flap for details. Clothianidin at the 1.25 mg a.i./seed rate available on select products.

[2] Class of 2016 and newer base genetics are treated with BioRise® 360 ST.

[3] Results from seven years of internal trials comparing hybrids treated with and without Enhanced Disease Control Offering + Poncho® Votivo® Seed Treatment. N=598.



ELITE

FUNGICIDES

Protection against soilborne and seedborne diseases, including *Fusarium*, *Rhizoctonia solani* and *Pythium*.

+ ENHANCED DISEASE CONTROL OFFERING

Offers a 3.7 bu/A advantage on average^[3] with enhanced early- to mid-season disease control due to the reduction of infections caused by *Fusarium*, *Rhizoctonia solani* and *Colletotrichum graminicola*.

INSECTICIDES ^[1]

Controls over 15 corn insect pests and protects against damage from early season pests, such as wireworm, seedcorn maggot, white grub, grape colaspis and black cutworm. Standard insecticide rate of 0.50 mg a.i./seed for products containing Clothianidin.

NEW MY24 ACCELERON® N-314 SEED TREATMENT NEMATICIDE OFFERING

on VT4PRO™ with RNAi Technology and SmartStax® PRO with RNAi Technology on Bayer-owned seed brands for the 2024 season.

NEMATICIDES ^[1]

Protection against damage from a wide range of nematode species. Refer to your 2024 seed price card for availability and pricing.

BIO-ENHANCERS

+ BioRise® Corn Offering ^[2]

Designed to increase functional root volume, as well as water and nutrient uptake through enhanced mycorrhizal colonization.



Bayer Cotton Technologies for 2024



Combining ThryvOn™ Cotton with the proven Bollgard® 3 XtendFlex® Technology results in cotton which contains the insecticidal proteins Cry51Aa2, Cry1Ac, Cry2Ab2 and Vip3Aa19. These varieties have the same insect protection as Bollgard® 3 with the added season-long protection against tarnished plant bugs and thrips species,¹ which may help reduce the number of foliar insecticide applications needed to control these sucking pests. Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology varieties include tolerance to labeled dicamba, glyphosate and glufosinate herbicides, providing effective weed control options for use before, at and after planting.



Bollgard® 3 XtendFlex® Cotton combines the proven performance of the insecticidal proteins Cry1Ac and Cry2Ab2 with Vip3Aa19 for greater protection against cotton bollworm, tobacco budworm, fall armyworm and beet armyworm while further decreasing the chance of resistance development. The increased insecticidal efficacy of Bollgard® 3 Cotton is combined with the triple herbicide tolerance to labeled dicamba,² glyphosate and glufosinate herbicides from XtendFlex® Technology to provide our highest available level of protection from yield-robbing insects and weeds.



Bollgard II® XtendFlex® Cotton contains two distinct insecticidal proteins, Cry1Ac and Cry2Ab2 for control of tobacco budworm, pink bollworm and cotton bollworm. Bollgard II® XtendFlex® Cotton provides tolerance to labeled dicamba,² glyphosate and glufosinate herbicides, allowing effective and sustainable weed control options for use before, at and after planting.



XtendFlex® Cotton varieties include tolerance to labeled dicamba,² glyphosate and glufosinate herbicides, providing effective weed control options for use before, at and after planting.



Bollgard II® with Roundup Ready® Flex Cotton varieties offer growers the benefits of both insect protection and glyphosate tolerance combined in one crop. These varieties exhibit the same insect protection qualities as Bollgard II® Cotton and are tolerant to in-crop applications of Roundup WeatherMAX®, Roundup PowerMAX® and Roundup PowerMAX® II, and the more concentrated Roundup PowerMAX® 3 herbicide, when used according to label directions.



Bayer Cotton Technologies for 2024



Roundup Ready® Flex Cotton varieties offer improved tolerance to the active ingredient in Roundup® Brand Agricultural Herbicides. This technology gives growers the opportunity to make in-crop broadcast applications of Roundup WeatherMAX®, Roundup PowerMAX® and Roundup PowerMAX® II, and the more concentrated Roundup PowerMAX® 3 herbicide, when used according to label directions.



Bollgard II® Cotton varieties contain two distinct insecticidal proteins, Cry1Ac and Cry2Ab2, from *Bacillus thuringiensis* (*B.t.*) that control tobacco budworm, pink bollworm and cotton bollworm. Bollgard II® Cotton also provides control against fall armyworm, beet armyworm, cabbage and soybean loopers and other secondary leaf- or fruit-feeding caterpillar pests of cotton.



The Acceleron® portfolio delivers coverage on three fronts: fungicides, insecticides, and nematicides to help protect your seed investment against diseases, insects and nematodes as well as moisture or nutrient stress. For more information, please consult your local retailer or visit cropscience.bayer.us/seedgrowth/acceleron.

¹ ThryvOn™ Technology may help reduce insecticide applications for tarnished plant bugs and thrips species [tobacco thrips (*Frankliniella fusca*), Western flower thrips (*Frankliniella occidentalis*), tarnished plant bug (*Lygus lineolaris*) and the Western Tarnished Plant bug (*Lygus hesperus*)]. Scouting is critical to determine which and how many insecticide applications are recommended to avoid economic losses greater than the pest management costs (i.e., when economic thresholds are met).

² Bayer will not authorize the use of dicamba herbicides containing the dimethylamine (DMA) salt of dicamba for use in Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® or XtendFlex® Cotton even if the EPA were to approve those herbicides for use with those products.

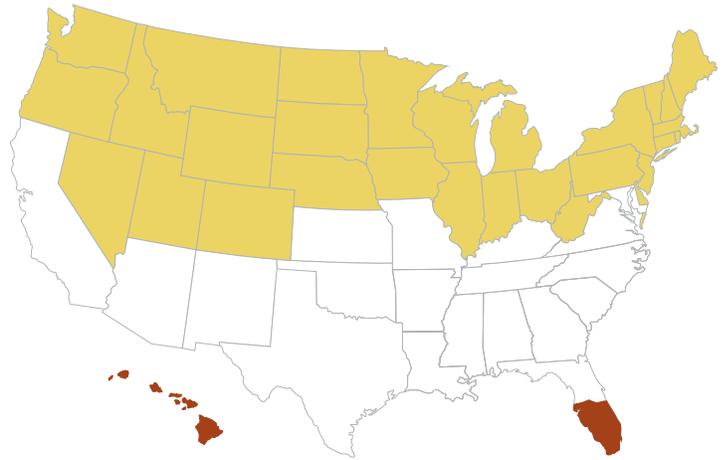
Areas of the United States where Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex® and Bollgard II® XtendFlex® Cotton products cannot be grown

● Sale Prohibited

Sale or commercial planting of Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex® and Bollgard II® XtendFlex® Cotton is prohibited in Hawaii, Puerto Rico and the U.S. Virgin Islands, and in Florida counties of Pinellas, Hillsborough, Hardee, Highlands, Okeechobee and St. Lucie and all counties south thereof.

● Sale Not Allowed

Sale or commercial planting of Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex® and Bollgard II® Cotton is not allowed in the following: Alaska, Colorado, Connecticut, Delaware, Idaho, Illinois, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Washington, Washington D.C., West Virginia, Wisconsin and Wyoming.



Cotton Seed Treatment Requirement

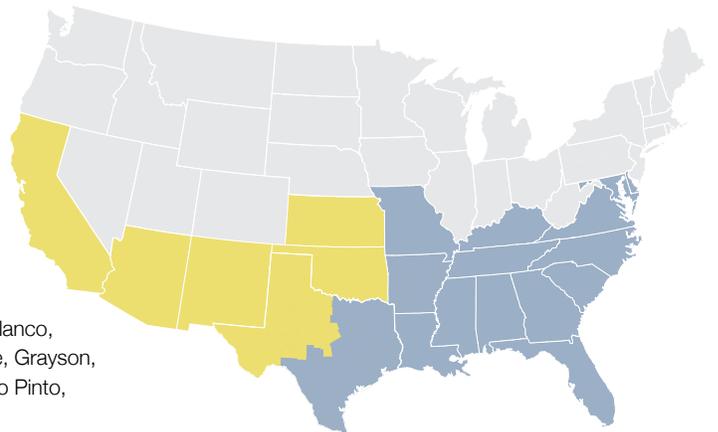
● Required

Imidacloprid applied to seed containing ThryvOn™ Technology

Growers who plant seeds containing ThryvOn™ technology must have applied a commercial rate of imidacloprid, that contains a total rate of 0.375 milligrams active ingredient per seed or 12.8 ounces active ingredient per hundred weight (weight of 100 pounds of seed) to all seed planted in the U.S. for the following States or Counties:

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Missouri, Mississippi, North Carolina, South Carolina, Tennessee, Texas (the following counties plus all counties South and East thereof: Blanco, Bosque, Bowie, Burnet, Clay, Cooke, Coryell, Edwards, Fannin, Gillespie, Grayson, Hood, Jack, Kimble, Lamar, Lampasas, Mason, Menard, Montague, Palo Pinto, Red River, Somervell, Val Verde) and Virginia.

● Exempt



Bollgard® 3 XtendFlex® Cotton, Bollgard II® XtendFlex® Cotton, XtendFlex® Cotton, Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology*

Cotton with XtendFlex® Technology refers to Bollgard® 3 XtendFlex® Cotton, Bollgard II® XtendFlex® Cotton, XtendFlex® Cotton and Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology



Growers should follow recommended weed management guidelines when managing Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex®, XtendFlex® Cotton and Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology. Where the planting of Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex® and Bollgard II® XtendFlex® Cotton is permitted, the use of natural refuge is allowed. Growers must manage target and non-target pests as described in each product's IRM Cotton Grower Guide on the seed bag tag.

Weed Management

Weed control in cotton is essential to help maximize both fiber yield and quality potential. Cotton is especially sensitive to early season weed competition, which can result in unacceptable stands and/or reduced yield potential. With tolerance to dicamba, glufosinate and

glyphosate, Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton provide additional weed control options for use before, at and after planting.

Select timing of application based on the most difficult-to-control weed species in your field.

Post-direct or hooded sprayers can be used to achieve more thorough spray coverage on weeds and can allow the use of other approved herbicides to control tough weeds.

Residual herbicide(s) may be applied as either a pre-emergence (including preplant incorporated), post-emergence and/or layby application as allowed on the label of the specific product being used. Weeds growing at the time of the residual herbicide application will need to be controlled using a post-emergence herbicide.



Bollgard® 3 XtendFlex® Cotton, Bollgard II® XtendFlex® Cotton, XtendFlex® Cotton, Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology *continued*

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and the applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing herbicide resistance in Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field, using either a burndown herbicide application, residual herbicide or tillage, making sure weeds are controlled at planting.
- Add soil residual herbicide(s) and cultural practices as part of a Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton weed control program.
 - Soil residual herbicides are critical to control emerging glyphosate-resistant weeds, such as pigweed.
 - Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected.
- In-crop, apply Roundup WeatherMAX® herbicide at 22 fl oz/acre, or Roundup PowerMAX® 3 herbicide at 20 fl oz/acre, when weeds are less than 3 inches in height and tank mix with another approved herbicide, if necessary.
- An application of XtendiMax® herbicide with VaporGrip® Technology at 22 fl oz/acre should be applied to weeds 4 inches or less in height. XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent volatility reduction adjuvant). For approved tank-mix products (including VRAs and DRAs), nozzles and other important label information, visit xtendimaxapplicationrequirements.com.
- Sequential application of XtendiMax® herbicide with VaporGrip® Technology may be necessary to control new flushes of weeds or on tough-to-control weeds. Allow 7 days between applications.
- For XtendiMax® herbicide with VaporGrip® Technology, a maximum of 2 burndown/early preplant, preplant, at-planting and preemergence and 2 in-crop applications may be made.
- Late-season control of emerged weeds with a diversity of control tools will reduce the potential of adding more seeds to the seedbank.
- Liberty® herbicide may also be used at labeled rates when weeds are 3 inches or less in height. (Please refer to the Liberty® herbicide label.)
- Equipment should be cleaned before moving from field to field to minimize the spread of weed seed as well as nematodes, insects and other cotton pests.
- Report any incidence of non-performance of applied herbicides against a particular weed species to your appropriate company representative or local retailer. For Bayer products please call **1-866-992-2937** or **1-844-RRXTEND**.

Herbicide Applications for Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton

Roundup WeatherMAX®, Roundup PowerMAX®, Roundup PowerMAX® II and Roundup PowerMAX® 3 Herbicides

- May be applied in-crop from crop emergence to seven days prior to harvest.
- A maximum rate of 32 fl oz/acre per application of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or a maximum rate of 30 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied using ground application equipment.
- A maximum rate of 22 fl oz/acre per application of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or a maximum rate of 20 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied by air.
- There are no growth or timing restrictions for sequential applications.
- Four (4) quarts/acre (128 fl oz/acre) of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or 3.75 quarts/acre (120 fl oz/acre) of Roundup PowerMAX® 3 herbicide, is the total in-crop volume allowed from emergence to 60% open bolls.
- A maximum total volume of 44 fl oz/acre of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or 40 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied between layby and 60% open bolls.
- Post-directed application of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, either alone or in a tank mix with another herbicide labeled for post-directed application in cotton may be used to achieve more thorough spray coverage of weeds.

Pre-harvest Application

- Up to 44 fl oz/acre of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or 40 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied after cotton reaches 60% open bolls and before harvest, if needed.
- Application must be made at least seven days prior to harvest.
- The maximum volume of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide that may be used in a single season is 5.3 quarts/acre (169.6 fl oz/acre). The maximum volume of Roundup® PowerMAX 3 herbicide that may be used in a single season is 5 quarts/acre (160 fl oz/acre).

XtendiMax® Herbicide with VaporGrip® Technology

Dicamba Use

Not all herbicides containing dicamba are approved for use in Roundup Ready® Xtend Crops. Many dicamba products are NOT approved for use in Roundup Ready® Xtend Crops. If a dicamba herbicide is not labeled for use in Roundup Ready® Xtend Crops, you cannot legally apply it to Roundup Ready® Xtend crops. The only dicamba herbicides that can be used in Roundup Ready® Xtend Crops are those specifically labeled for use in Roundup Ready® Xtend Crops — like XtendiMax® Herbicide with VaporGrip® Technology.

XtendiMax® Herbicide with VaporGrip® Technology's usage in Roundup Ready® Xtend Crops must be done according to the label and any applicable state requirements. Bayer has developed specific resources to assist growers with proper applications of XtendiMax® Herbicide with VaporGrip® Technology, including XtendiMax-specific training programs. Visit the website [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) or call **1-844-RRXTEND** if you have any questions.

Use of XtendiMax® Herbicide with VaporGrip® Technology

XtendiMax® herbicide with VaporGrip® Technology is a restricted-use pesticide. The label for this product was updated in February 2023. All use of this product must be in accordance with the current label. Users must have all labeling applicable to their location in their possession for XtendiMax® to be lawfully applied. EPA has approved amended labeling for this product which must be followed. It is a violation of FIFRA Section 12 to use a registered pesticide in a manner inconsistent with its labeling. Check the registration status of Roundup Ready® Xtend Technology in each state and complete the mandatory dicamba applicator training requirement before using.

Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for a copy of the current Federal label requirements, as well as allowable tank mix partners, approved volatility reduction adjuvants and drift reduction adjuvants, approved nozzles and pressure ranges, record keeping requirements and other directions for proper use. Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for any state specific application guidelines. The applicator is responsible for avoiding off-site spray drift to the extent consistent with applicable law.

Be aware of nearby non-target sites and changing environmental conditions. The RRRxtend Spray app is a helpful digital tool that provides location-specific weather forecasts, digital recordkeeping capabilities and education resources related to Roundup Ready® Xtend Technology.

- Federal label requirements permit in-crop applications of XtendiMax® herbicide with VaporGrip® Technology up to and including July 30 for cotton. Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for any state specific application guidelines.
- For every application of XtendiMax® with VaporGrip® Technology, an approved Volatility Reduction Adjuvant (VRA) must be included in the spray solution. An approved Drift Reduction Adjuvant (DRA) must also be included in the spray solution, unless otherwise indicated on [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com). Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for a list of approved DRAs and VRAs.
- Apply only 22 fl oz/acre (0.5 lb a.e./A) of XtendiMax® herbicide with VaporGrip® Technology for a single burndown/early preplant, preplant, at-planting or preemergence application.
- Apply only 22 fl oz/acre of XtendiMax® herbicide with VaporGrip® Technology for any single post-emergence/in-crop application.
- Apply in a minimum of 15 gallons of spray solution per acre. Use 20 gallons per acre or greater when treating dense weed canopies.
- Sequential applications may be made at least 7 days apart.
- A maximum of two burndown/early preplant, preplant, at-planting and preemergence and two in-crop applications may be made.
- A combined total per year for all applications cannot exceed 88 fl oz/acre (2.0 lb a.e./A).
- For best results, dicamba-based weed management programs must include the use of residual herbicides pre-emergence as well as at least one post-emergence application.
- Allow a minimum of 7 days between application and harvest.
- Report any incidence of non-performance of XtendiMax® herbicide with VaporGrip® Technology against a particular weed species to your Bayer retailer or representative or call **1-844-RRXTEND**.

Liberty® Herbicide Glufosinate Use

- Apply from emergence to early bloom growth stage.
- Sequential applications should be applied at least 10 days after the first application.
- Up to 87 fl oz/acre of Liberty® herbicide can be applied on cotton per growing season or up to 72 fl oz/acre if more than 29 fl oz/acre was used in a single application. See the Liberty® herbicide label for guidelines on maximum seasonal use rates.
- A tank mix of a Liberty® herbicide and a Roundup® Brand Agricultural Herbicide may result in reduced grass control.
- Do not apply within 70 days of harvest.
- Consult product label for full use directions and restrictions.

Bollgard® 3 XtendFlex® Cotton, Bollgard II® XtendFlex® Cotton, XtendFlex® Cotton, Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology *continued*

Crop Safety of In-Crop Glyphosate Applications

Bayer has determined that a combination of components in glyphosate formulations has the potential to cause leaf injury when applied during later stages of crop growth. Roundup WeatherMAX®, Roundup PowerMAX®, Roundup PowerMAX® II and Roundup PowerMAX® 3 herbicides are the only Roundup® Brand Agricultural Herbicides labeled and approved for use in Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton.

Leaf injury may occur if the products are not used according to the product label, used at rates higher than directed or if overlap of spray occurs in the field. Growers must confirm that any glyphosate formulation to be used on Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton is labeled for use on Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton and has been tested to demonstrate crop safety.

Crop Safety of In-Crop Dicamba Applications

Post-emergence applications of dicamba may cause a leaf response to Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex®, Bollgard® 3 ThryvOn™ Cotton with XtendFlex® Technology and XtendFlex® Cotton. The symptoms usually appear as necrotic spots on fully expanded leaves. Incidence of response can increase when dicamba is tank mixed with other herbicides or insecticides. To reduce the incidence and severity of necrosis, consider increasing the spray volume to greater than 15 GPA or greater and lowering adjuvant rates. Emulsifiable Concentrate-based products (EC) that are tank mixed with products containing dicamba may increase the severity of the leaf damage.

Crop Safety of In-Crop Liberty® Herbicide Applications

Post-emergence applications of Liberty® herbicide may cause a leaf response in Bollgard® 3 ThryvOn™ cotton with XtendFlex® Technology, Bollgard® 3 XtendFlex®, Bollgard II® XtendFlex® and XtendFlex® Cotton. The symptoms usually appear as minor and temporary spotting on leaves. Crop injury may result from tank mix applications with other registered herbicides, surfactants, crop oils or other tank mixes. Leaf injury may occur if Liberty® herbicide is not used according to the product label.

Additional Information

Various weed biotypes are known to be resistant to dicamba, glufosinate and glyphosate. For the current weed control recommendations for herbicide-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at [cdms.net/Label-Database](https://www.cdms.net/Label-Database). Approved labels, including any applicable supplemental labeling, for Bayer agricultural herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information. Complete label information for these and all recommended products can be found at www.cdms.net.

Additional stewardship and education and training resources on XtendiMax® herbicide with VaporGrip® Technology can be found at roundupreadyxtend.com/stewardship/Pages/default.aspx. XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent volatility reduction adjuvant). Visit xtendimaxapplication-requirements.com for approved tank-mix products (including VRAs and DRAs), nozzles and other important label information.



Bollgard II® with Roundup Ready® Flex Cotton, Roundup Ready® Flex Cotton

Growers should follow recommended weed management guidelines when managing Bollgard II® with Roundup Ready® Flex Cotton and Roundup Ready® Flex Cotton.



Where the planting of Bollgard II® with Roundup Ready® Flex Cotton and Roundup Ready® Flex Cotton is permitted, the use of natural refuge is allowed. Growers must manage target and non-target pests as described in each product's IRM Cotton Grower Guide on the seed bag tag.

Pima Cotton (*Gossypium barbadense*) Market Options

Roundup Ready® Flex Pima Cotton does not have the same export approvals in place as Roundup Ready® Flex Cotton. Roundup Ready® Flex Pima Cotton is approved for cultivation in the United States and for export to Canada, Japan and Mexico. Do not market cottonseed, meal, linters or gin trash from Roundup Ready® Flex Pima Cotton to a third party who may send such products or processed fractions outside of the approved countries. Growers should talk to their grain handler, cotton gin or product purchaser to confirm their buying position for this product.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing herbicide resistance in Roundup Ready® Flex Cotton.

Weed control in cotton is essential to help maximize both fiber yield and quality potential. Cotton is especially sensitive to early season weed competition, which can result in unacceptable stands and/or reduced yield potential. The Roundup Ready® Flex Cotton System with improved tolerance to glyphosate, the active ingredient in Roundup® Brand Agricultural Herbicides, provides growers with the right tools to control weeds.

Select timing of application based on the most difficult-to-control weed species in your field.

Post-direct or hooded sprayers can be used to achieve more thorough spray coverage on weeds and can allow the use of other approved herbicides to control tough weeds.

A residual herbicide(s) may be applied as either a pre-emergence (including preplant incorporated), post-emergence and/or layby application as allowed on the label of the specific product being used. Weeds growing at the time of the residual herbicide application will need to be controlled using a post-emergence herbicide.

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for herbicide-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, for Bayer agricultural herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field, using either burndown herbicide(s) application, residual herbicide(s) and/or tillage and make sure weeds are controlled at planting.
- Add soil residual herbicide(s), such as Warrant® herbicide, and cultural practices as part of a Roundup Ready® Flex Cotton weed control program.
 - Soil residual herbicides are critical to control emerging glyphosate-resistant weeds, such as pigweed.
 - Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected.
- In-crop, apply Roundup WeatherMAX® Roundup PowerMAX®, or Roundup PowerMAX® II herbicides at a minimum of 22 fl oz/acre, or Roundup PowerMAX® 3 herbicide at a minimum of 20 fl oz/acre, when weeds are less than 3 inches in height and tank mix with another approved herbicide, if necessary.
- Late-season control of emerged weeds with a diversity of control tools will reduce the potential of adding more seeds to the seedbank.
- Equipment should be cleaned before moving from field to field to minimize the spread of weed seed as well as nematodes, insects and other cotton pests.

Bollgard II® with Roundup Ready® Flex Cotton, Roundup Ready® Flex Cotton *continued*

- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Application of Roundup WeatherMAX®, Roundup PowerMAX®, Roundup PowerMAX® II and Roundup PowerMAX® 3 Herbicides

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing herbicide resistance in a Roundup Ready® Flex Cotton System.

- May be applied in-crop from crop emergence to seven days prior to harvest.
- A maximum rate of 32 fl oz/acre per application of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX II herbicide, or 30 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied using ground application equipment.
- A maximum rate of 22 fl oz/acre per application of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX II herbicide, or 20 fl oz/acre of Roundup PowerMAX® 3 herbicide may be applied by air.
- There are no growth or timing restrictions for sequential applications.
- Four (4) quarts/acre (128 fl oz/acre) of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX II herbicide, or 3.75 quarts (120 fl oz/acre) of Roundup PowerMAX® 3 herbicide, is the total in-crop volume allowed from emergence to 60% open bolls.
- A maximum total volume of 44 fl oz/acre of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX II herbicide, or 40 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied between layby and 60% open bolls.
- Post-directed application of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicides, either alone or in a tank mix with another herbicide labeled for post-directed application in cotton may be used to achieve more thorough spray coverage of weeds.

Pre-harvest Application

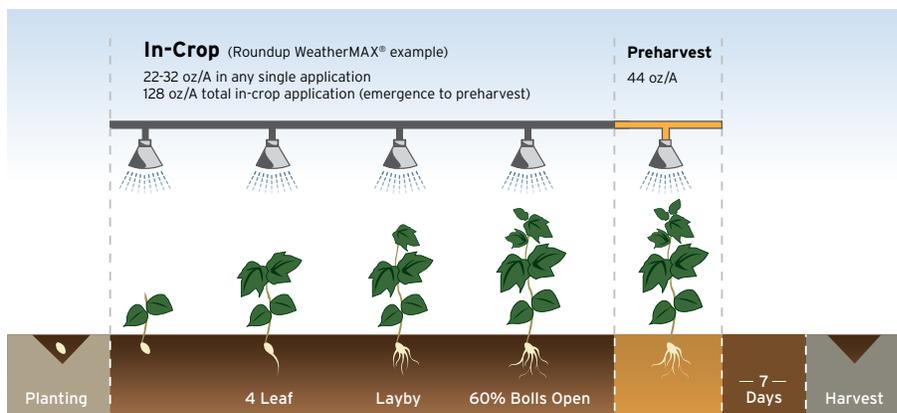
- Up to 44 fl oz/acre of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX II herbicide, or 40 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied after cotton reaches 60% open bolls and before harvest, if needed.
- Application must be made at least seven days prior to harvest.
- The maximum volume of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide that may be used in a single season is 5.3 quarts/acre (169.6 fl oz/acre). The maximum volume of the more concentrated Roundup PowerMAX® 3 herbicide that may be used in a single season is 5 quarts/acre (160 fl oz/acre).

Crop Safety of In-Crop Glyphosate Applications

Bayer has determined that a combination of components in glyphosate formulations have the potential to cause leaf injury when applied during later stages of crop growth. Roundup WeatherMAX®, Roundup PowerMAX®, Roundup PowerMAX® II and Roundup PowerMAX® 3 herbicides are the only Roundup® Brand Agricultural Herbicides labeled and approved for use in Roundup Ready® Flex Cotton.

Leaf injury may occur if the products are not used according to the product label, used at rates higher than directed or if overlap of spray occurs in the field. Growers must confirm that any glyphosate formulation to be used on Roundup Ready® Flex Cotton is labeled for use on Roundup Ready® Flex Cotton and has been tested to demonstrate crop safety.

Herbicide Application Windows



Acceleron® Cotton Offerings



The Acceleron® Brand portfolio helps protect your seed investment against diseases, insects, nematodes, and moisture or nutrient stress.

Fungicides

Cotton seedling diseases cost cotton growers an average of 350M pounds per year. Our exclusive combinations of fungicides help protect against these damaging diseases, including *Rhizoctonia solani*, *Pythium*, *Fusarium* and *Thielaviopsis basicola*.

Insecticides

Early season cotton insects feed on seeds and seedlings, which can cause delayed emergence, stand loss, plant injury and stunting. Our insecticides protect against certain sucking insects—including thrips and aphids—that cause significant damage to cotton crops across the U.S. cotton-growing area.

Nematicides + Copeo® Seed Treatment

Nematodes cost an estimated 10.7% yield loss in cotton.* They pierce and infect roots, causing a loss of nutrients and water while

opening the door for secondary issues. Copeo® Seed Treatment is a seed treatment for cotton that contributes to higher yield potential under nematode pressure.

Acceleron® Seed Applied Solutions

The tiers of Acceleron® Seed Applied Solutions available on cotton products in 2024 are shown below.

Additional Offerings

Additional Offerings from SeedGrowth®:

- Aeris® Insecticide/Nematicide
- EverGo® Xtend C Fungicide

For more information, please consult your local retailer or visit cropscience.bayer.us/seedgrowth/acceleron.

For important information related to stewardship and best management practices for seed treatments, refer to page 16 of this Technology Use Guide.

*Nationwide estimated loss. Ferris, Howard. "Nematodes and Plant Damage." University of California, 1 Oct. 2015. Web.

2024 Cotton Offerings



FUNGICIDES

Protection against *Rhizoctonia solani*, *Pythium*, *Fusarium* and *Thielaviopsis basicola* with an exclusive combination of fungicides and more rapid and increased emergence of seedlings under certain cold conditions.

INSECTICIDES

Reduces damage to cotton caused by early season insect pests, including thrips and aphids.

NEMATICIDES

Protection against damage from a wide range of nematode species.



FUNGICIDES

Protection against *rhizoctonia solani*, *pythium*, *fusarium* and *thielaviopsis basicola* with an exclusive combination of fungicides and more rapid and increased emergence of seedlings under certain cold conditions.

INSECTICIDES

Reduces damage to cotton caused by early season insect pests, including thrips and aphids.



FUNGICIDES

Protection against *Rhizoctonia solani*, *Pythium*, *Fusarium* and *Thielaviopsis basicola* with an exclusive combination of fungicides and more rapid and increased emergence of seedlings under certain cold conditions

Additional Offerings

EVERGOL® XTEND C FUNGICIDE

AERIS® SEED-APPLIED INSECTICIDE/NEMATICIDE

Additional cotton offerings from Bayer available for purchase through your local distributor.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products. Not all products are registered in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Acceleron® is a registered trademark of Bayer Group. ©2023 Bayer Group. All rights reserved.



BAYER SOYBEAN TECHNOLOGIES

2024

SOYBEAN

BAYER SOYBEAN TECHNOLOGIES





Bayer Soybean Technologies for 2024



XtendFlex® Soybeans are built on Roundup Ready 2 Xtend® Technology to help maximize yield potential, and they have tolerance to labeled dicamba¹, glyphosate and glufosinate herbicides² which will provide additional weed control options for use before, at and after planting.



Ready 2 Xtend® Soybeans are built on Roundup Ready 2 Yield® Technology to help maximize yield potential, and they have tolerance to labeled dicamba¹ and glyphosate herbicides, providing additional weed control options for use before, at and after planting.



Roundup Ready 2 Yield® Soybeans combine in-plant tolerance to labeled glyphosate herbicides with a high-yield potential product.



Vistive® Gold Soybeans with Roundup Ready 2 Yield® Technology combine in-plant tolerance to labeled glyphosate herbicides with a high-yield potential product that produces a low-saturate, high-oleic soybean oil with broad applications.



The Acceleron® portfolio delivers coverage on two fronts—fungicide and insecticide—to help protect your seed investment against diseases and insects. For more information, please consult your local retailer or visit cropscience.bayer.us/seedgrowth/acceleron

¹ Bayer will not authorize the use of dicamba herbicides containing the dimethylamine (DMA) salt of dicamba for use in Roundup Ready 2 Xtend® or XtendFlex® Soybeans even if the EPA were to approve those herbicides for use with these products.

² Only use herbicides labeled for use in the Roundup Ready® Xtend Crop System and LibertyLink® System.

XtendFlex® Soybeans

XtendFlex® Soybeans are built on Roundup Ready 2 Xtend® soybean technology. XtendFlex® Soybeans enable growers to continue to maximize their yield potential through planting elite genetics on their farm, as well as benefit from soybean technology with tolerance to dicamba¹, glyphosate and glufosinate herbicides². Such flexibility offers growers three effective herbicide options against tough-to-control weeds.



Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-, glufosinate- and/or dicamba-resistant weed populations in a XtendFlex® Soybeans.

Starting clean with a weed-free field and controlling subsequent weeds when they are small are critical steps to obtaining excellent weed control and maximum yield potential. XtendFlex® Soybeans are designed to provide the flexibility to use the diversity of herbicide tools including dicamba¹ glyphosate and now glufosinate² tolerance necessary to control weeds before planting, at planting and in-crop. Failure to control weeds with the right rate, at the right time and with the right product can lead to increased weed competition, the potential for selecting for herbicide resistance and possible decreased yield.

Recommendations

- Scout fields before and after each herbicide application.
- Start with a clean field, using either a burndown herbicide application, residual herbicide or tillage, making sure weeds are controlled at planting.
- Add soil residual herbicide(s), such as Warrant® or Warrant® Ultra herbicide, applied at an appropriate rate as listed on the label and cultural practices as part of a weed control program.
 - Soil residual herbicides are critical to control emerging glyphosate-resistant weeds such as pigweed.
 - Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected.
- In-crop, apply Roundup WeatherMAX® herbicide at a minimum of 22 fl oz/acre or Roundup PowerMAX® 3 herbicide at 20 fl oz/acre and XtendiMax® herbicide with VaporGrip® Technology at 22 fl oz/acre before weeds exceed 4 inches in height.

- If an additional flush of weeds occurs, apply a sequential application of Roundup WeatherMAX® herbicide at 22 fl oz/acre or Roundup PowerMAX® 3 herbicide at 20 fl oz/acre and XtendiMax® herbicide with VaporGrip® Technology at 22 fl oz/acre before weeds exceed 4 inches in height.
- A glufosinate herbicide, such as Liberty® herbicide, may be used at the labeled rate. See applicable product label.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3 herbicide, application rates will be lower than for Roundup WeatherMAX® herbicide.
- If using another approved glyphosate agricultural herbicide or dicamba herbicide, you must refer to the label booklet or any applicable supplemental labeling for the use of that product on Roundup Ready 2 Xtend® Soybeans or XtendFlex® Soybeans and follow the label directions.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- Report any incidence of non-performance of applied herbicides against a particular weed species to your appropriate company representative or local retailer. For Bayer products, please call **1-866-992-2937** or **1-844-RRXTEND**.

XtendiMax® Herbicide with VaporGrip® Technology

Dicamba Use in Soybeans

Not all herbicides containing dicamba are approved for use in Roundup Ready® Xtend Crops. Many dicamba products are NOT approved for use in Roundup Ready® Xtend Crops. If a dicamba herbicide is not labeled for use in Roundup Ready® Xtend Crops, you cannot legally apply it to Roundup Ready® Xtend crops. The only dicamba herbicides that can be used in Roundup Ready® Xtend Crops are those specifically labeled for use in Roundup Ready® Xtend Crops — like XtendiMax® Herbicide with VaporGrip® Technology.

XtendiMax's usage with Roundup Ready® Xtend Crops must be done according to the label and any applicable state requirements. Bayer has developed specific resources to assist growers with proper

¹ Bayer will not authorize the use of dicamba herbicides containing the dimethylamine (DMA) salt of dicamba for use in XtendFlex® Soybeans even if the EPA were to approve those herbicides for use in XtendFlex® Soybeans.

² Only use herbicides labeled for use in Roundup Ready® Xtend Crops and/or LibertyLink® System.

applications of XtendiMax, including XtendiMax-specific training programs. Visit the website [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) or call **1-844-RRXTEND** if you have any questions.

Use of XtendiMax® Herbicide with VaporGrip® Technology

XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide. The label for this product was updated in February 2023. All use of this product must be in accordance with the current label. Users must have all labeling applicable to their location in their possession for XtendiMax® to be lawfully applied. EPA has approved amended labeling for this product which must be followed. It is a violation of FIFRA Section 12 to use a registered pesticide in a manner inconsistent with its labeling. Check the registration status of XtendiMax® herbicide with VaporGrip® Technology in each state and complete the mandatory dicamba user training requirement before using.

Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for a copy of the current label, as well as allowable tank mix partners including approved volatility reduction adjuvants and drift reduction adjuvants, approved nozzles and pressure ranges, record keeping requirements and other directions for proper use. The applicator is responsible for avoiding off-site spray drift to the extent consistent with applicable law. Be aware of nearby non-target sites and changing environmental conditions. The RRXTend Spray app is a helpful digital tool that provides location-specific weather forecasts, digital recordkeeping capabilities and education resources related to Roundup Ready® Xtend Technology.

- Federal label requirements permit in-crop applications of XtendiMax® herbicide with VaporGrip® Technology in-crop up to and including June 30. Applications occurring after R1 are prohibited as crop response may occur and in no event can applications be made after June 30 regardless of growth stage. Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for any state specific application guidelines.
- For every application of XtendiMax® With VaporGrip® Technology, an approved Volatility Reduction Adjuvant (VRA), such as VaporGrip® Xtra Agent, must be included in the spray solution. An approved Drift Reduction Adjuvant (DRA) must also be included in the spray solution, unless otherwise indicated on [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com). Refer to the website for a list of approved DRAs and VRAs.
- Apply only 22 fl oz/acre (0.5 lb a.e./A) for a single burndown/early preplant, preplant, at-planting or preemergence application. Please refer to the applicable product label. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls.
- Apply only 22 fl oz/acre (0.5 lb a.e./A) for any single post-emergence/ in-crop application.
- Apply in a minimum of 15 gallons of spray solution per acre. Use 20 gallons per acre or greater when treating dense weed canopies.
- Sequential applications may be made at least 7 days apart.

- A maximum of two burndown/early preplant, preplant, at-planting and preemergence and two in-crop applications may be made.
- A combined total per year for all applications may not exceed 88 fl oz/acre (2.0 lb a.e./A).
- For best results, dicamba-based weed management programs must include the use of residual herbicides pre-emergence as well as at least one post-emergence application.
- Allow a minimum of 7 days between application and harvest.

Report any incidence of non-performance of XtendiMax® herbicide with VaporGrip® Technology against a particular weed species to your Bayer retailer or representative or call **1-844-RRXTEND**.

Additional stewardship, education and training resources on XtendiMax® herbicide with VaporGrip® Technology can be found at roundupreadyxtend.com/stewardship/Pages/default.aspx.

Liberty® Herbicide

- Consult product label for full use directions and restrictions.
- Liberty® herbicide may not be tank mixed with XtendiMax® herbicide with VaporGrip® Technology.
- Apply from emergence up to bloom or R1 growth stage.
- Apply a minimum of 29 fl oz/acre per application.
- Do not apply more than 43 fl oz/acre of Liberty® herbicide in a single application.
- Do not apply more than 87 fl oz/acre of Liberty® herbicide on XtendFlex® Soybeans per year.
- Do not apply within 70 days of harvest.
- Consult product label for full use directions and restrictions.
- A tank mix of a Liberty® herbicide and a Roundup® Brand Agricultural Herbicide may result in reduced grass control.

Additional Information

Weeds such as lambsquarters, waterhemp, pigweed and giant ragweed tend to emerge throughout the season. Sequential Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide, XtendiMax® herbicide with VaporGrip® Technology and/or Liberty® herbicide (a glufosinate herbicide) applications and/or the addition of a soil residual herbicide may be required for control of subsequent weed flushes.

Various weed biotypes are known to be resistant to glufosinate, glyphosate and dicamba. For the current weed control recommendations for herbicide-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Various weed biotypes are also 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. Approved labels, including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides, XtendiMax® herbicide with VaporGrip® Technology and/or Liberty® herbicide must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937**, **1-844-RRXTEND**, or by contacting your State Pesticide Lead Agency for more information.

Roundup Ready 2 Xtend[®] Soybeans

Roundup Ready 2 Xtend[®] Soybeans are built on Roundup Ready 2 Yield[®] Technology.



Growers can continue to help maximize their yield opportunities through planting elite genetics on their farms as well as by using the weed management recommendations on roundupreadyxtend.com and incentives provided by Bayer PLUS. Roundup Ready 2 Xtend[®] Soybeans have tolerance to dicamba and glyphosate herbicides.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between the recommendations in this guide and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate- and/or dicamba-resistant weed populations in Roundup Ready 2 Xtend[®] Soybeans.

Starting clean with a weed-free field and controlling subsequent weeds when they are small are critical steps to obtaining excellent weed control and maximum yield potential. Roundup Ready[®] Xtend Crops provide the flexibility to use the diversity of herbicide tools necessary to control weeds before planting, at planting and in-crop. Failure to control weeds with the right rate at the right time and with the right product can lead to increased weed competition, the potential for selecting for herbicide resistance and possible decreased yield.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- All use of these products must be in accordance with their current label.
- Start with a clean field, using either burndown herbicide(s) application, residual herbicide(s) and/or tillage, making sure weeds are controlled at planting. Roundup WeatherMAX[®] and XtendiMax[®] herbicide with VaporGrip[®] Technology can be used for a burndown application.

- Add soil residual herbicide(s), such as Warrant[®] herbicide, applied at an appropriate rate as listed on the label and cultural practices as part of a weed control program.
 - Soil residual herbicides are critical to control emerging glyphosate-resistant weeds such as pigweed.
 - Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected.
- In-crop, apply Roundup WeatherMAX[®] herbicide at a minimum of 22 fl oz/acre or Roundup PowerMAX[®] 3 herbicide at a minimum of 20 fl oz/acre and apply XtendiMax[®] herbicide with VaporGrip[®] Technology at 22 fl oz/acre before weeds exceed 4 inches in height.
- If an additional flush of weeds occurs, apply a sequential application of Roundup WeatherMAX[®] or Roundup PowerMAX[®] 3 herbicide and XtendiMax[®] herbicide with VaporGrip[®] Technology at 22 fl oz/acre before weeds exceed 4 inches in height. Allow at least 7 days between applications.
- If using Roundup PowerMAX[®] or Roundup PowerMAX[®] II herbicide, application rates are the same as for Roundup WeatherMAX[®] herbicide. If using the more concentrated Roundup PowerMAX[®] 3 herbicide, application rates will be lower than for Roundup WeatherMAX[®] herbicide.
- If using another approved glyphosate agricultural herbicide or dicamba herbicide, you must refer to the label booklet or any applicable supplemental labeling for the use of that product on Roundup Ready 2 Xtend[®] Soybeans and follow the label directions.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- Report any incidence of repeated non-performance of Roundup[®] Brand Agricultural Herbicides, other glyphosate products, or XtendiMax[®] herbicide with VaporGrip[®] Technology products on a particular weed to the appropriate company representative, local retailer or county extension agent.

*Bayer will not authorize the use of dicamba herbicides containing the dimethylamine (DMA) salt of dicamba for use in Roundup Ready 2 Xtend[®] Soybeans even if the EPA were to approve those herbicides for use in Roundup Ready 2 Xtend[®] Soybeans.

XtendiMax® Herbicide with VaporGrip® Technology

Dicamba Use

Not all herbicides containing dicamba are approved for use in Roundup Ready® Xtend Crops. Many dicamba products are NOT approved for use in Roundup Ready® Xtend Crops. If a dicamba herbicide is not labeled for use in Roundup Ready® Xtend Crops, you cannot legally apply it to Roundup Ready® Xtend crops. The only dicamba herbicides that can be used in Roundup Ready® Xtend Crops are those specifically labeled for use in Roundup Ready® Xtend Crops—like XtendiMax® Herbicide with VaporGrip® Technology.

XtendiMax® Herbicide with VaporGrip® Technology's usage in the Roundup Ready® Xtend Crops must be done according to the label and any applicable state requirements. Bayer has developed specific resources to assist growers with proper applications of XtendiMax® Herbicide with VaporGrip® Technology, including XtendiMax-specific training programs. Visit [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) or call **1-844-RRXTEND** if you have any questions.

Use of XtendiMax® Herbicide with VaporGrip® Technology

XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide. The label for this product was updated in February 2023. All use of this product must be in accordance with the current label. Users must have all labeling applicable to their location in their possession for XtendiMax® to be lawfully applied. EPA has approved amended labeling for this product which must be followed. It is a violation of FIFRA Section 12 to use a registered pesticide in a manner inconsistent with its labeling. Check the registration status of XtendiMax® herbicide with VaporGrip® Technology in each state and mandatory dicamba user training requirement before using.

Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for a copy of the current label, as well as allowable tank mix partners including approved volatility reduction adjuvants and drift reduction adjuvants, approved nozzles and pressure ranges, record keeping requirements and other directions for proper use. The applicator is responsible for avoiding off-site spray drift to the extent consistent with applicable law. Be aware of nearby non-target sites and changing environmental conditions. The RRXtend Spray app is a helpful digital tool that provides location-specific weather forecasts, digital recordkeeping capabilities and education resources related to Roundup Ready® Xtend Technology.

- Federal label requirements permit in-crop applications of XtendiMax® herbicide with VaporGrip® Technology in-crop up to and including June 30. Applications occurring after R1 are prohibited as crop response may occur and in no event can applications be made after June 30 regardless of growth stage. Refer to [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com) for any state-specific application guidelines.
- For **every** application of XtendiMax® With VaporGrip® Technology, an approved Volatility Reduction Adjuvant (VRA) must be included

in the spray solution. An approved Drift Reduction Adjuvant (DRA) must also be included in the spray solution, unless otherwise indicated on [xtendimaxapplicationrequirements.com](https://www.xtendimaxapplicationrequirements.com). Refer to the website for a list of approved DRAs and VRAs.

- Apply only 22 fl oz/acre (0.5 lb a.e./A) for a single burndown/early preplant, preplant, at-planting or preemergence application.
- Apply only 22 fl oz/acre (0.5 lb a.e./A) for any single post-emergence/ in-crop application.
- Apply in a minimum of 15 gallons of spray solution per acre. Use 20 gallons per acre or greater when treating dense weed canopies.
- Sequential applications may be made at least 7 days apart.
- A maximum of two burndown/early preplant, preplant, at-planting and preemergence and two in-crop applications may be made.
- A combined total per year for all applications may not exceed 88 fl oz/acre (2.0 lb a.e./A).
- For best results, dicamba-based weed management programs must include the use of residual herbicides pre-emergence as well as at least one post-emergence application.
- Allow a minimum of 7 days between application and harvest.

Report any incidence of non-performance of XtendiMax® herbicide with VaporGrip® Technology against a particular weed species to your Bayer retailer or representative or call **1-844-RRXTEND**.

Additional stewardship, education and training resources on XtendiMax® herbicide with VaporGrip® Technology can be found at [roundupreadyxtend.com/stewardship/Pages/default.aspx](https://www.roundupreadyxtend.com/stewardship/Pages/default.aspx).

Additional Information

Weeds such as lambsquarters, waterhemp, pigweed and giant ragweed tend to emerge throughout the season. Sequential Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide or XtendiMax® herbicide with VaporGrip® Technology applications or the addition of a soil residual herbicide may be required for control of subsequent weed flushes.

Various weed biotypes are known to be resistant to glufosinate, glyphosate and dicamba. For the current weed control recommendations for herbicide-resistant weed biotypes, please call **1-866-992-2937**. 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. A complete list of specimen labels can be located at [cdms.net/Label-Database](https://www.cdms.net/Label-Database). Approved current labels, including supplemental labeling, for Roundup® Brand Agricultural Herbicides, XtendiMax® herbicide with VaporGrip® Technology and/ or Liberty® herbicide must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937**, **1-844-RRXTEND**, or by contacting your State Pesticide Lead Agency for more information.

Vistive® Gold Soybeans with Roundup Ready 2 Yield® Technology

Vistive® Gold Soybeans with Roundup Ready 2 Yield® Technology combine in-plant tolerance to glyphosate herbicides with a high-yield potential product with two end-use applications to help create higher prices per bushel.



Vistive® Gold's use as a cooking oil offers an improved nutritional profile and longer shelf life. In automotive and industrial lubricant uses, it can help to match or exceed the performance of other high-quality products and can contribute to fewer impacts on the environment.

A nutritionally improved cooking oil for consumers and food companies

- Developed with input from leading food companies.
- Provides food manufacturers with the ability to reduce saturated fat and trans fat.
- Has high stability and retains excellent flavor, even for fried foods.
- An environment-friendly alternative for industrial use because it is a renewable source.
- Used as a primary ingredient in high-performing, bio-based lubricants and synthetic motor oils.
- Industrial lubricants formulated with plant-based oils, such as soybean oil, biodegrade at significantly higher rates than their petroleum counterparts.
- Synthetic lubricants made from Vistive® Gold Soybean oil provide natural detergency for cleaner engines, less varnish and fewer deposits on metal surfaces than conventional petroleum oil products.

Processor-Paid Incentives

Vistive® Gold Soybeans with Roundup Ready 2 Yield® Technology are managed as an Identity Preserved contracting program.

Participating processors set their incentive levels independently. Contract growers receive a processor-paid incentive for producing and delivering high oleic Identity Preserved soybeans. As a result, growers need to identify which processors have a Vistive® Gold Soybeans Program in 2024 and grow the soybeans under contract to be eligible for the incentive.

The Process to Maintain High Oleic Specifications

- Clean seed hopper/boxes prior to planting Vistive® Gold Soybeans.
- Identify and mark fields that are planted with Vistive® Gold Soybeans.
- Completely empty the combine and other harvest equipment prior to and after harvesting Vistive® Gold Soybeans.
- Clean storage bins, trucks and wagons prior to handling Vistive® Gold Soybeans to maintain purity.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between the recommendations in this guide and applicable pesticide product labeling, the pesticide product labeling controls. Follow the guidelines below to help minimize the risk of developing glyphosate-resistant weed populations in Roundup Ready® Soybeans.

Starting clean with a weed-free field and controlling subsequent weeds when they are small are critical steps in obtaining excellent weed control and maximum yield potential. The Roundup Ready 2 Yield® Soybean System provides the flexibility to use the diversity of herbicide tools necessary to control weeds before planting, at planting and in-crop. Failure to control weeds with the right rate, at the right time and with the right herbicide product can lead to increased weed competition, the potential for selecting herbicide tolerant weeds and possible decreased yield.

Spray labeled Roundup® Brand Agricultural Herbicides according to product label terms and conditions.

Recommendations

- Always read and follow all precautions and requirements in the label booklet and any applicable separately published supplemental labeling for the agricultural herbicide or any other pesticide product you are using. Nothing in this TUG should be construed as a substitute for reading all product labeling.
- Scout fields before and after each burndown and in-crop application.
- Start with a clean field, using either a burndown herbicide application, residual herbicide or tillage to ensure weeds are controlled at planting.
- Add soil residual herbicide(s) such as Warrant® applied at an appropriate rate as listed on the label and cultural practices as part of a weed control program.
 - Soil residual herbicides are critical to control emerging glyphosate-resistant weeds, such as pigweed.
 - Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected.
- In-crop, apply Roundup WeatherMAX® herbicide at a minimum of 22 fl oz/acre, or Roundup PowerMAX® 3 Herbicide at minimum of 20 fl oz/acre, before weeds exceed 4 inches in height. Warrant® herbicide or Warrant® Ultra herbicide may be applied post-emergence to soybeans for residual control of small grasses and small-seeded broadleaf weeds.
- If an additional flush of weeds occurs, a sequential application of Roundup WeatherMAX® herbicide tank mixed with additional herbicides before weeds exceed 4 inches in height may be needed.
- If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or any applicable supplemental labeling for the use of that product on Roundup Ready 2 Yield® Soybeans to determine appropriate use rates.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3 herbicide, application rates will be lower than for Roundup WeatherMAX® herbicide.
- Refer to individual product labels for approved tank mix partners.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

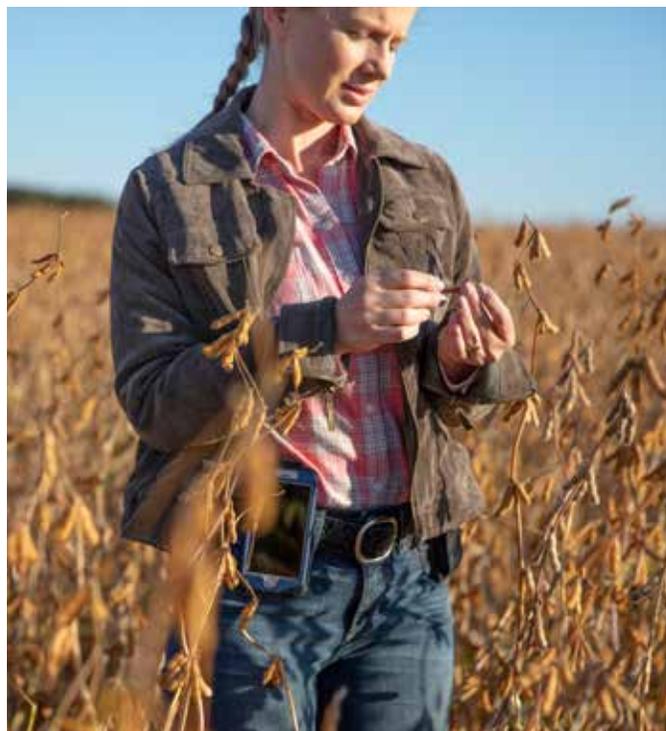
Additional Information

Weeds such as pigweed, lambsquarters, waterhemp and giant ragweed tend to emerge throughout the season. Sequential Roundup PowerMAX® herbicide applications or the addition of a soil residual herbicide may be required for control of subsequent weed flushes.

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. 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. Approved labels, including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Planting Recommendation

Soybean fatty acid composition can be affected by temperatures during grain fill with warmer temperatures having shown a positive impact on oleic acid levels. In research trials under normal planting time frames, Vistive® Gold Soybeans have performed as expected. To minimize the risk of adverse temperatures during grain fill, it is recommended that Vistive® Gold Soybeans are planted timely.



Roundup Ready 2 Yield[®] Soybeans

Roundup Ready 2 Yield[®] Soybeans contain in-plant tolerance to glyphosate herbicides, such as Roundup WeatherMAX[®], Roundup PowerMAX[®] or Roundup PowerMAX[®] II herbicides or the more concentrated Roundup PowerMAX[®] 3 herbicide, for application in-crop from emergence through flowering.



Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between the recommendations in this guide and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in Roundup Ready 2 Yield[®] Soybeans.

Starting clean with a weed-free field and controlling subsequent weeds when they are small are critical to obtaining excellent weed control and maximum yield potential. Roundup Ready 2 Yield[®] Soybeans provide the flexibility to use the diversity of herbicide tools necessary to control weeds before planting, at planting and in-crop. Failure to control weeds with the right rate, at the right time and with the right herbicide product can lead to increased weed competition, the potential for selecting for herbicide-tolerant weeds and possible decreased yield.

Spray Roundup[®] Brand Agricultural Herbicides in-crop from emergence (cracking) through flowering (R2 stage soybeans) for excellent weed control, proven crop safety and maximum yield potential. R2 stage soybeans end when a pod 5 millimeters (3/16 inch) long at one of the four uppermost nodes appears on the main stem along with a fully developed leaf (R3 stage).

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field, using either a burndown herbicide application, residual herbicide or tillage, making sure weeds are controlled at planting.
 - Add soil residual herbicide(s), such as Warrant[®] herbicide, applied at an appropriate rate as listed on the label and cultural practices as part of a weed control program.
 - Soil residual herbicides are critical to control emerging glyphosate-resistant weeds, such as pigweed.
 - Residual herbicides should be used multiple times during the growing season if glyphosate-resistant weeds are expected.
- In-crop, apply Roundup WeatherMAX[®] herbicide at a minimum of 22 fl oz/acre or Roundup PowerMAX[®] 3 herbicide at a minimum of 20 fl oz/acre before weeds exceed 4 inches in height. Warrant[®] herbicide may be applied post-emergence to soybeans but prior

to weed emergence for residual control of small grasses and small-seeded broadleaf weeds.

- If an additional flush of weeds occurs, a sequential application of Roundup WeatherMAX[®] herbicide at 22 fl oz/acre or Roundup PowerMAX[®] 3 herbicide at 20 fl oz/acre before weeds exceed 4 inches in height may be needed.
- If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that product on Roundup Ready 2 Yield[®] Soybeans to determine appropriate use rates.
- If using Roundup PowerMAX[®] or Roundup PowerMAX[®] II herbicides, application rates are the same as for Roundup WeatherMAX[®] herbicide. If using the more concentrated Roundup PowerMAX[®] 3 herbicide, application rates will be lower than for Roundup WeatherMAX[®] herbicide.
- Refer to individual product labels for approved tank mix partners.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- Report any incidence of repeated non-performance of Roundup[®] Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Additional Information

Weeds such as pigweed, lambsquarters, waterhemp and giant ragweed tend to emerge throughout the season. Sequential Roundup PowerMAX[®] herbicide applications, or the addition of a soil residual herbicide, may be required for control of subsequent weed flushes.

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, for Roundup[®] Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Acceleron® Soybean Offerings



The Acceleron® portfolio helps protect your seed investment against diseases and insects.

Fungicides

Four key diseases cost soybean growers over 90M bushels per year. Our exclusive combinations of fungicides protect against these top diseases, including *Fusarium*, *Pythium*, early season *Phytophthora* and *Rhizoctonia solani*.

Insecticides

Early season soybean insects feed on seeds and seedlings, which can cause delayed emergence, stand loss, plant injury and stunting. Our insecticides control nine early season insects—including bean leaf beetles, early season soybean aphids and seedcorn maggots—that cause significant damage to soybean crops across the U.S.

Nematicides + ILEVO® Seed Treatment

Nematodes can cause an estimated 10.6% yield loss in soybeans.* They pierce and infect roots, causing a loss of nutrients and water

*Nationwide estimated loss. Ferris, Howard. "Nematodes and Plant Damage." University of California, 1 Oct. 2015. Web.

while opening the door for secondary issues. ILEVO® Seed Treatment helps protect against multiple key soybean plant parasitic nematodes (SCN, RKN, RN).

Acceleron® Seed Applied Solutions

The tiers of Acceleron® Seed Applied Solutions available on soybean products in 2024 are shown below.

Additional Offerings

- Acceleron® E-007 SAT and ILEVO® Seed Treatment
- Acceleron® B-200 SAT
- ILEVO®

For more information, talk to your local retailer or visit crops.science.bayer.us/seedgrowth/acceleron.

For important information related to stewardship and best management practices for seed treatments, please refer to page 16 of this Technology Use Guide.

2024 Soybean Offerings



FUNGICIDES

Protection against *Pythium*, early-season *Phytophthora*, *Rhizoctonia solani* and *Fusarium* with an exclusive combination of fungicides and more rapid and increased emergence of seedlings under certain conditions.



FUNGICIDES

Protection against *Pythium*, early-season *Phytophthora*, *Rhizoctonia solani* and *Fusarium* with an exclusive combination of fungicides and more rapid and increased emergence of seedlings under certain cold conditions.

INSECTICIDES

Protection from pests including bean leaf beetles, early-season soybean aphids and seed corn maggots.

Additional Offerings

ILEVO® SEED TREATMENT

ILEVO® Seed Treatment offers protection against Sudden Death Syndrome and damage caused by plant parasitic nematodes, including Soybean Cyst Nematodes (SCN).



Upstream

ACCELERON® SEED APPLIED SOLUTIONS SEED BRAND OFFERING

- Asgrow®
- Alloy™ (Enlist offering)
- Channel®
- Connect™ (Enlist offering)
- Fontanelle Hybrids®
- Gold Country Seed®
- Hubner Seed & Design®
- Jung Seed Genetics™
- Kruger Seeds™
- Lewis Hybrids™
- REA Hybrids™
- Specialty Hybrids™
- Stewart Seeds™
- Stone Seed™

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products. Not all products are registered in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Acceleron® is a registered trademark of Bayer Group. ©2023 Bayer Group. All rights reserved.



BAYER CANOLA TECHNOLOGIES

2024

CANOLA

BAYER CANOLA TECHNOLOGIES





Bayer Canola Technologies for 2024



TruFlex® Canola with Roundup Ready® Technology is part of an improved system designed for a range of growing conditions that provides high-yield potential varieties that have tolerance to glyphosate herbicides, enabling a wider application window for grower flexibility and better weed control and crop safety.



TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies is part of an improved system designed for a range of growing conditions that provides high-yield potential varieties that have tolerance to glyphosate and glufosinate herbicides that provide additional weed control options and enable a wider glyphosate application window for grower flexibility and better weed control and crop safety.



DEKALB® LibertyLink® Canola contains the LibertyLink® trait combining in-plant tolerance to glufosinate herbicides with a high-yield potential product.



Roundup Ready® Spring Canola combines in-plant tolerance to glyphosate herbicides with a high-yield potential product.

Roundup Ready® Winter Canola combines in-plant tolerance to glyphosate herbicides with a high-yield potential product developed for seeding in the fall and harvesting in the following spring/summer.

TruFlex[®] Canola with Roundup Ready[®] Technology

TruFlex[®] Canola with Roundup Ready[®] Technology is part of an improved system designed for a range of growing conditions, providing high-yield potential varieties and improved tolerance to glyphosate herbicides, delivering better weed control and crop safety over other Roundup Ready[®] Canola products.



The TruFlex[®] Canola System enables a wider glyphosate application window providing growers with up to 10-14 more spray days than our Roundup Ready[®] Canola products. The TruFlex[®] Canola System allows for the control of a broad spectrum of tough-to-control weeds, including cleavers, foxtail barley and wild buckwheat. It also helps enable season-long dandelion control. TruFlex[®] Canola with Roundup Ready[®] Technology also allows growers the option to apply Roundup WeatherMAX[®] herbicide in-crop at a rate of 44 fl oz/acre, or Roundup PowerMAX[®] 3 herbicide at a rate of 40 fl oz/acre, for a single application up to the six-leaf stage with improved crop safety. Also with the added benefit of a wider window of application that extends past the six-leaf stage all the way to the first flower, growers have more flexibility to manage in-crop applications.

Planting Limitation

Grower must not plant products with TruFlex[®] Canola technology in any wildlife feed plots.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in TruFlex[®] Canola.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field by using a burndown herbicide application, residual herbicide or tillage and making sure weeds are controlled at planting.
- In-crop, apply Roundup WeatherMAX[®] or the more concentrated Roundup PowerMAX[®] 3 herbicide before weeds exceed 3 inches in height.

- A sequential application of Roundup WeatherMAX[®] or Roundup PowerMAX[®] 3 herbicide may be needed.
- If weather or a late flush of weeds occurs, you may spray up to first flower.
- Use mechanical weed control, cultivation and/or residual herbicides where appropriate in your TruFlex[®] Canola.
- Use additional herbicide mechanisms of action, residual herbicides and/or mechanical weed control in other Roundup Ready[®] crops rotated with TruFlex[®] Canola.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- There are several options for control of volunteer TruFlex[®] Canola in rotational crops, including Soybeans with Roundup Ready[®] Technology and Roundup Ready[®] Sugarbeets. Please consult your local seed representative or dealer for suggestions that fit your area.
- Report any incidence of repeated non-performance of Roundup[®] Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Application of Roundup[®] Brand Agricultural Herbicide

- Spray when canola is at emergence to six-leaf stage of growth.
- To help maximize yield potential, spray TruFlex[®] Canola at the one- to three-leaf stage to eliminate competing weeds.
- No more than two in-crop applications may be made from emergence through first flower, with a total in-crop application of Roundup WeatherMAX[®] herbicide not exceeding 44 fl oz/acre, or of Roundup PowerMAX[®] 3 herbicide not exceeding 40 fl oz/acre.



- No more than 22 fl oz/acre of Roundup WeatherMAX herbicide or 20 fl oz/acre of Roundup PowerMAX® 3 herbicide may be applied in-crop after the six-leaf stage.
- Wait a minimum of 10 days between applications. Two applications of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide can:
 - Control late flushes of annual weeds such as foxtail, pigweed and wild mustard.
 - Provide season-long suppression of Canada thistle, quackgrass and perennial sow thistle.
 - Provide better yield potential by eliminating competition from both annuals and hard-to-control perennials.
- If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that product on TruFlex® Canola for appropriate use rates.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3 herbicide, application rates will be lower than for Roundup WeatherMAX® herbicide.

- Maximum use rates apply to the total amount applied of all glyphosate-containing products. Please see the Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide label for more information on maximum use rates.

Additional Information

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, call **1-866-992-2937**. Approved supplemental labeling for Bayer herbicide products can be obtained by calling **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies

TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies is part of an improved system designed for a range of growing conditions that provides high-yield potential varieties that have tolerance to glyphosate and glufosinate herbicides, thus providing additional weed control options and enabling a wider glyphosate application window for grower flexibility and better weed control and crop safety



TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies has tolerance to glyphosate and glufosinate herbicides, providing growers with additional weed control options for use before, at and after planting.

TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies enables a wider glyphosate application window, providing growers with up to 10-14 more spray days than our Roundup Ready® Canola products. TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies allows for the control of a broad spectrum of tough-to-control weeds, including cleavers, foxtail barley and wild buckwheat. It also will help enable season-long dandelion control. In addition, TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies will allow growers to apply Roundup WeatherMAX® herbicide in-crop at a rate of 44 fl oz/acre or Roundup PowerMAX® 3 herbicide at 40 fl oz/acre for a single application, or two applications of Roundup WeatherMAX® herbicide at 22 fl oz/acre for two applications each, or two applications of Roundup PowerMAX® 3 herbicide at 20 fl oz/acre each, to control 24 new weed species, all with improved crop safety. Also with the added benefit of a wider window of application that extends past the six-leaf stage all the way to the first flower, growers will have more flexibility to manage their in-crop applications.

TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies also provides the added flexibility of the LibertyLink® trait that allows growers to spray glufosinate in-crop for nonselective post-emergence control of the toughest weeds, including pigweed, giant ragweed, waterhemp, kochia, wild buckwheat and marestalk.

Planting Limitation

Grower must not plant TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies in any wildlife feed plots.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between the recommendations in this guide and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field by using a burndown herbicide application, residual herbicide or tillage, making sure weeds are controlled at planting.
- In-crop, apply Roundup WeatherMAX® or the more concentrated Roundup PowerMAX® 3 herbicide before weeds exceed 3 inches in height.
- A sequential application of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide may be needed.
- If weather or a late flush of weeds occurs, you may spray up to first flower.
- Use mechanical weed control, cultivation and/or residual herbicides where appropriate in your TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies.
- Use additional herbicide mechanisms of action, residual herbicides and/or mechanical weed control in other Roundup Ready® crops rotated with TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.

- There are several options for control of volunteer TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies in rotational crops, including soybeans with Roundup Ready® Technology and Roundup Ready® Sugarbeets. Please consult your local seed representative or dealer for suggestions that fit your area.
- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Application of Roundup® Brand Agricultural Herbicide

- Spray when canola is at emergence to the six-leaf stage of growth. To help maximize yield potential, spray TruFlex® canola at the one- to three-leaf stage to eliminate competing weeds.
- No more than two in-crop applications of Roundup WeatherMAX® herbicide may be made from emergence through first flower with a total in-crop application not exceeding 44 fl oz/acre, or two applications of Roundup PowerMAX® 3 herbicide with a total in-crop application rate of 40 fl oz/acre.
- No more than 22 fl oz/acre of Roundup WeatherMAX® herbicide, or 20 fl oz/acre of Roundup PowerMAX® 3 herbicide, may be applied in-crop after the six-leaf stage.
- Wait a minimum of 10 days between applications. Two applications of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide can:
 - Control late flushes of annual weeds such as foxtail, pigweed and wild mustard.
 - Provide season-long suppression of Canada thistle, quackgrass and perennial sow thistle.
 - Provide better yield potential by eliminating competition from both annuals and hard-to-control perennials.
- If using another approved glyphosate or glufosinate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that product on TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies for appropriate use rates.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3 herbicide, application rates will be lower than for Roundup WeatherMAX® herbicide.
- Maximum use rates apply to the total amount applied of all glyphosate-containing products. See the Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide label for more information on maximum use rates.

Application of Liberty® 280 SL Herbicide

Apply Liberty® herbicide at 22-29 fl oz/acre, plus graminicide, over the top of TruFlex® Canola with Roundup Ready® and LibertyLink® Technologies from emergence to 10 days after crop emergence or when weeds are 3 inches or less.

Apply Liberty® herbicide at 22-29 fl oz/acre on an as-needed basis following the first application of 22-29 fl oz/acre. If sequential applications are planned, apply the second application a minimum of 10 days after the first application.

Maximum seasonal use: up to 87 fl oz/acre of Liberty® herbicide can be applied on canola per growing season. This includes preplant burndown and in-season post-emergence use.

Do not apply glufosinate within 65 days of harvest.

Addition of ammonium sulfate is recommended at 1.5 to 3.0 lb/acre to improve control of difficult-to-control weeds.

Rates are dependent on tank mix partners, environmental conditions, temperatures and potential for leaf burn.

Refer to all federal, state and local herbicide labeling for planting restrictions.

Do not graze treated crop or cut for hay.

Additional Information

A tank mix of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide and glufosinate may result in reduced weed control. An early application of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide is recommended up to the three-leaf stage, followed by an application of Liberty® herbicide (no later than the six-leaf stage).

Various weed biotypes are known to be resistant to glyphosate and glufosinate. For the current weed control recommendations for herbicide-resistant weed biotypes, please call **1-866-992-2937**.

Approved supplemental labeling for Bayer herbicide products can be obtained by calling **1-866-992-2937**. A complete list of specimen labels can be located at **cdms.net/Label-Database**. Approved labels, including any applicable supplemental, for Liberty® and Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

DEKALB® LibertyLink® Canola

DEKALB® LibertyLink® Canola contains the LibertyLink® trait combining in-plant tolerance to glufosinate herbicides with a high-yield potential product. The LibertyLink® trait allows growers to spray glufosinate in-crop for nonselective post-emergence control of the toughest weeds, including pigweed, giant ragweed, waterhemp, kochia, wild buckwheat and marestalk.



For canola products containing the LibertyLink® trait, growers must hold both a valid and current Bayer Technology Stewardship Agreement and BASF Grower Technology Agreement before purchasing such products.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glufosinate-resistant weed populations in DEKALB® LibertyLink® Canola.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field, using a burndown herbicide application, residual herbicide or tillage, making sure that weeds are controlled at planting.
- In-crop, apply glufosinate herbicide before weeds exceed 7.5 cm in height per label directions.

- A sequential application of glufosinate, per label directions, may be needed.
- Use mechanical weed control, cultivation and/or residual herbicides where appropriate in your DEKALB® LibertyLink® Canola.
- Use additional herbicide mechanisms of action, residual herbicides and/or mechanical weed control in other LibertyLink® crops rotated with DEKALB® LibertyLink® Canola.
- Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- There are several options for control of volunteer DEKALB® LibertyLink® Canola in rotational crops. Talk to your local seed representative or dealer for suggestions that fit your area at **1-888-283-6847**.
- Report any incidence of repeated non-performance of glufosinate agricultural herbicides on a particular weed to the appropriate company representative, local retailer or government extension agent.

Additional Information

- Spray when canola is at the cotyledon to early bolt stage of growth.
- Slight discoloration of the canola may be visible after application. This effect is temporary and will not influence the crop growth, maturity or yield.



- Wait a minimum of 10 days between applications. Two applications of glufosinate can achieve the following:
 - Control late flushes of annual weeds such as foxtail, pigweed and wild mustard.
 - Provide season-long suppression of Canada thistle, quackgrass and perennial sow thistle.
 - Provide better yield potential by eliminating competition from both annuals and hard-to-control perennials.
- Do not apply glufosinate within 65 days of harvest.
- Do not graze the treated crop or cut for hay.
- Do not spray glyphosate herbicides on DEKALB® LibertyLink® Canola.

Various weed biotypes are known to be resistant to glufosinate. For the current weed control recommendations for herbicide-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplement labeling for Liberty® herbicide, must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Application of Liberty® 150 SN Herbicide

Apply Liberty® 150 SN herbicide at 0.54–1.62 L/acre, plus a permitted tank mix graminicide, over the top of DEKALB® LibertyLink® Canola from emergence to 10 days after crop emergence or when weeds are 8 cm or less.

A second application of Liberty® 150 SN herbicide can be made to canola treated initially with up to 1.62 L/acre if new weed germination or growth is present:

- A first application of up to 1.62 L/acre may be followed by a second application of up to 1.35 L/acre,

OR

- A first application of up to 1.35 L/acre may be followed by a second application of up to 1.62 L/acre.

Roundup Ready® Spring Canola

Roundup Ready® Spring Canola products contain in-plant tolerance to glyphosate, the active ingredient in Roundup® Brand Agricultural Herbicides.



You can spray Roundup Ready® Spring Canola with Roundup® Brand Agricultural Herbicides in-crop from emergence through the six-leaf stage of development.

The introduction of the Roundup Ready® trait into leading spring canola brands and varieties gives growers the opportunity for excellent weed control, proven crop safety and maximum yield potential. With Roundup Ready® Spring Canola, growers have the weed management tool necessary to help improve spring canola yield potential while providing a viable rotational crop to help break pest and disease cycles in cereal-growing areas.

Planting Limitation

Grower must not plant Roundup Ready® Spring Canola in any wildlife feed plots.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between the recommendations in this guide and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in Roundup Ready® Spring Canola.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field, using either a burndown herbicide application, residual herbicide or tillage, and make sure weeds are controlled at planting.



- In-crop, apply Roundup WeatherMAX® herbicide or the more concentrated Roundup PowerMAX® 3 Herbicide before weeds exceed 3 inches in height.
- A sequential application of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide may be needed.
- Use mechanical weed control, cultivation and/or residual herbicides where appropriate in your Roundup Ready® Spring Canola.
- In other Roundup Ready® crops rotated with Roundup Ready® Spring Canola, it is important to use additional herbicide mechanisms of action, residual herbicides and/or mechanical weed control to minimize development of herbicide-tolerant weeds. Equipment should be cleaned before moving from field to field to help minimize the spread of weed seed.
- There are several options for control of volunteer Roundup Ready® Spring Canola in rotational crops, including soybeans with Roundup Ready® Technology and Roundup Ready® Sugarbeets. Talk to your local seed representative or dealer for suggestions that fit your area.
- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Application of Roundup® Brand Agricultural Herbicide

- Spray Roundup Ready® Spring Canola from emergence to the six-leaf stage of growth. To help maximize yield potential, spray Roundup Ready® Spring Canola at the one- to three-leaf stage to eliminate competing weeds. Short-term yellowing may occur with later applications with little effect on crop growth, maturity or yield.
- Wait a minimum of 10 days between applications. Two applications of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide can:
 - Control late flushes of annual weeds, such as foxtail, pigweed and wild mustard.
 - Provide season-long suppression of Canada thistle, quackgrass and perennial sow thistle.
 - Provide better yield potential by eliminating competition from both annuals and hard-to-control perennials.

- If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that product on Roundup Ready® Spring Canola for appropriate use rates.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3 herbicide, application rates will be lower than Roundup WeatherMAX® herbicide.

Maximum use rates apply to the total amount of all glyphosate-containing products applied. Please see the Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide label for more information on maximum use rates.

Additional Information

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. Approved supplemental labeling for Bayer herbicide products can be obtained by calling **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Roundup Ready® Winter Canola

Roundup Ready® Winter Canola products have been developed for seeding in the fall and harvesting the following spring/summer.



Roundup Ready® Winter Canola brands and varieties contain in-plant tolerance to the active ingredient glyphosate in Roundup® Brand Agricultural Herbicides so you can spray Roundup Ready® Winter Canola with Roundup® Brand Agricultural Herbicides in-crop from emergence to the pre-bolting stage.

The introduction of the Roundup Ready® trait into winter canola products gives growers the opportunity for excellent weed control, crop safety and maximum yield potential. Roundup Ready® Winter Canola offers growers an important option as a rotational crop in traditional monoculture winter wheat production areas. Introducing crop rotation is an important factor in reducing pest cycles, including weed and disease problems.

Grazing

Bayer recommends that Roundup Ready® Winter Canola not be grazed. While Roundup Ready® Winter Canola may provide growers additional opportunity as a forage for grazing livestock in the future, insufficient information exists now to allow safe and proper grazing recommendations. Preliminary data suggest that excessive grazing can significantly reduce yield and that careful nitrate management is critical in managing Roundup Ready® Winter Canola as a forage to limit the risk of livestock nitrate poisoning.

Planting Limitation

Grower must not plant Roundup Ready® Winter Canola in any wildlife feed plots.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in Roundup Ready® Winter Canola.

Recommendations

- Scout fields before and after each burndown and in-crop application.
- Start with a clean field using either a burndown herbicide, residual herbicide or tillage, making sure weeds are controlled at planting.
- In-crop, apply Roundup WeatherMAX® or the more concentrated Roundup PowerMAX® 3 herbicide before weeds exceed 3 inches in height.
- A sequential application of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide may be needed.
- Use mechanical weed control, cultivation and/or residual herbicides where appropriate in your Roundup Ready® Winter Canola.
- In other Roundup Ready® crops rotated with Roundup Ready® Winter Canola, it is important to use additional herbicide mechanisms of action, residual herbicides and/or mechanical weed control.
- Equipment should be cleaned before moving from field to field to minimize the spread of weed seed.
- There are several options for control of volunteer Roundup Ready® Winter Canola in rotational crops. Please consult your local seed representative or dealer for suggestions that fit your area.
- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.
- Spray when Roundup Ready® Winter Canola is at the two- to three-leaf stage of growth. Early applications can eliminate competing weeds and improve yield potential.

- Two applications of Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide can provide control of early emerging annual weeds and winter emerging weeds such as downy brome, cheat and jointed goatgrass.
- For sequential applications, spray Roundup Ready® Winter Canola at the two- to three-leaf stage and when weeds are small and actively growing. Applications must be made prior to bolting. Use the higher rate in the range when weed densities are high, when weeds have overwintered or when weeds become large and well established.
- Application of greater than 16 fl oz/acre prior to the six-leaf stage could result in temporary yellowing and/or growth reduction.
- If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that product on Roundup Ready® Winter Canola for appropriate use rates.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3

herbicide, the application rate will be lower than Roundup WeatherMAX® herbicide.

- Maximum use rates apply to the total amount applied of all glyphosate-containing products. Please see the Roundup WeatherMAX® herbicide or Roundup PowerMAX® 3 label for more information on maximum use rates.

Additional Information

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. Approved supplemental labeling for Bayer herbicide products can be obtained by calling **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling for Roundup® Brand Agricultural Herbicides, must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.

Additional Canola Information

Volunteer Canola Containing Roundup Ready® and/or LibertyLink® Technologies

Canola can present unique challenges as a volunteer plant due to the persistence of seeds in the soil; a small seed size that allows it to easily be moved by equipment, wind or water; pollen movement from flowering plants; and the ability for a single plant to produce a large number of seeds.

The introduction of herbicide tolerance in canola did not change the fundamental reasons volunteer canola can occur, but it does require that growers consider that Roundup Ready® and LibertyLink® Technologies (and other herbicide tolerance traits) may be present in volunteers when developing volunteer management plans for canola.

In addition to cultural control methods, there are numerous herbicide products that can be used to control volunteer canola containing Roundup Ready® Technology (or other herbicide tolerance traits) in cropping systems.

- If field scouting identifies volunteer canola prior to a burndown or pre-harvest application with a glyphosate herbicide, it is recommended to tank mix additional herbicides labeled for that

use and to ensure all volunteer canola (including other herbicide tolerant canola types) and any canola volunteers containing Roundup Ready® Technology are controlled.

- If field scouting identifies volunteer canola in another crop containing Roundup Ready® and/or LibertyLink® Technology, it is recommended to tank mix additional herbicides labeled for use in that crop type that control volunteer canola, including other herbicide tolerant canola types, with Roundup WeatherMAX®, Liberty® or other labeled glyphosate herbicides to ensure all volunteer canola, including any canola volunteers containing Roundup Ready® and/or LibertyLink® Technology, are controlled.
- Where conventional tillage is used, light cultivation provides effective control of all canola volunteers, including any containing Roundup Ready® and/or LibertyLink® Technology.

For additional information, please call the Bayer Technical Support Line at **1-866-992-2937**.



WestBred® Wheat

Bayer offers a portfolio of elite WestBred® wheat varieties that provides growers with high-yield potential options for both winter and spring wheat across all major classes.



Seed quality, patent/plant variety protection, and good stewardship practices are important factors in maximizing yield and profit potential while enabling Bayer to continue investment and innovation in wheat genetics.

Bayer's WestBred® single-use wheat varieties are included in the Technology Stewardship Agreement, establishing certain rights and obligations for wheat growers similar to other row crops.

The Technology Stewardship Agreement gives growers permission to use Bayer Technologies (as defined in the Technology Stewardship Agreement) on an annual basis. By entering into a Technology Stewardship Agreement, Bayer or its permitted designee subsequently issuing a grower a license number, the grower has a limited-use license to Bayer Technologies in wheat, including WestBred® wheat varieties, subject to the Technology Stewardship Agreement's terms and conditions.

Bayer will continue to patent new single-use wheat varieties that we commercialize. Intellectual property rights encourage advancements and investments in innovation. Our investments in advanced breeding allow us to accelerate the rate of innovation in wheat, which translates into additional value for farmers.

Intellectual property rights in the United States include patents on specific wheat varieties and Plant Variety Protection (PVP) certificates that plant breeders obtain when they develop a new variety.

A list of varieties designated by Bayer as single-use is published electronically at cs.bayerpatents.bayer.com and may be updated yearly at Bayer's sole discretion.



Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Cultural practices, including but not limited to, variety selection, planting date, seeding rate, seed treatment, fertility management, crop rotation and/or tillage can contribute to creating a favorable growth environment for wheat, giving it a competitive advantage over weeds. An example is wild oat, which can maintain dormancy or have delayed emergence unless stimulated to germinate early with cultivation.¹ Encouraging emergence prior to planting allows control with a nonselective burndown application or tillage.

Recommendations

- Start with a clean field by using a burndown herbicide application, such as Roundup PowerMAX[®] herbicide or RT3[®] herbicide, residual herbicide and/or tillage, making sure weeds are controlled at planting. Emerged, actively growing weeds have the potential to reduce early season yield potential.²
- Plant professionally produced treated wheat seed that is Certified or Quality Assured and conditioned by professional seed suppliers.
- If weed pressure is expected to be abnormally high or the expected weed species are hard to control with selective products, consideration should be given to planting a Clearfield[®] or Clearfield[®] Plus wheat variety.
- Scout fields frequently for the presence of weed emergence to help ensure timely control.
- In-crop, select and apply selective herbicide(s) to manage weed populations. Consult the respective label and pay special attention to the wheat growth stage, pre-harvest intervals and weed size restrictions as well as adhering to approved tank mix partners.
- In the event of late-emerging weeds that have the potential to hamper harvest, glyphosate can be applied to wheat that has reached physiological maturity or the hard-dough stage (maximum kernel dry weight). Consult the specific label of the glyphosate product you're applying for applicable pre-harvest intervals after application.
- Post-harvest weed control, including volunteer wheat, should be timed to limit moisture loss and prevent further deposit of weed seeds into the soil. Good in-season control often reduces weed population and vigor of weeds after harvest. Weeds that have been cut at harvest should have active regrowth before applying herbicide.³ Volunteer wheat control is vital, especially in continuous wheat or wheat-fallow-wheat rotations. Volunteer wheat that emerges after harvest can host insects that vector disease (green bridge). At least two weeks before seeding a new wheat crop, volunteer wheat plants should be controlled with Roundup PowerMAX[®] 3, RT3[®] or other effective herbicides.⁴

- Report any incidence of repeated non-performance of Roundup[®] Brand Agricultural Herbicides or other products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Clearfield[®] Production System for Wheat

Appropriate stewardship of the patent-protected Clearfield[®] Production System for wheat, which includes the use of registered herbicides, is vital to sustain the utility of this technology. All Clearfield[®] wheat growers are required to sign the BASF Clearfield[®] Wheat Stewardship Agreement that provides the terms and conditions for the authorized use of the product. BASF uses the AgCelerate Stewardship platform for grower licensing found at [AgCelerate.com](https://www.agcelerate.com). Clearfield[®] wheat growers should be aware of the following:

- Growers are required to sign a BASF Clearfield[®] Wheat Stewardship Agreement that specifies the use of registered herbicides on Clearfield[®] and Clearfield[®] Plus wheat, including imazamox-containing herbicides, along with purchasing certified Clearfield[®] and Clearfield[®] Plus varieties.
- Growers must purchase new seed every year from an authorized Clearfield[®] seed retailer. Saving seed to plant next year's crop is not allowed.
- Currently, Beyond[®] herbicide is the only federally and state approved imazamox-containing herbicide registered for use on Clearfield[®] and Clearfield[®] Plus wheat. Applications of any herbicide that is not registered for use on that crop is not permitted under the law.



EverGol[®] Energy is an innovative seed treatment fungicide that promotes more root growth for faster crop establishment. EverGol[®] Energy controls seed and soil-borne disease, such as *Rhizoctonia*.



For advanced broad-spectrum disease control, Raxil[®] PRO MD offers three modes of action against scab, smut, bunt and other diseases that threaten cereal seeds and seedlings.

Treating cereal seeds with Raxil PRO MD helps them emerge strong, green and lush. Applied directly to the seed, Raxil PRO MD offers advanced broad-spectrum protection against diseases that threaten cereal seeds and seedlings, promoting the development of a robust plant. The result is a healthier crop capable of producing high performance.

¹ Plant Variety Protection Office Fact Sheet. USDA-AMS (2016) www.ams.usda.gov/PVPO.

² Zollinger, R. Howatt, K., et al. 2015. 2015 North Dakota Weed Control Guide. North Dakota State University. W-253.

³ Burndown herbicides in no-till wheat. The Ohio State University. C.O.R.N. Newsletter. corn.osu.edu.

⁴ Klein, R. 2014. Controlling weeds post-harvest in winter wheat. University of Nebraska-Lincoln.



Bayer Alfalfa Technologies for 2024



Roundup Ready® Alfalfa products have in-plant tolerance to the active ingredient glyphosate in Roundup® Brand Agricultural Herbicides.



HarvXtra® Alfalfa with Roundup Ready® Technology 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.

Roundup Ready® Alfalfa Technology

Roundup Ready® Alfalfa products have in-plant tolerance to the active ingredient glyphosate in Roundup® Brand Agricultural Herbicides, which enables growers to apply Roundup® Brand Agricultural Herbicides up to five days before cutting for excellent weed control, crop safety and improved forage quality potential.



Hay and Forage Management Requirements

Roundup Ready® Alfalfa must be managed for high quality hay/forage production, including timely cutting to promote high forage quality (i.e., generally before 10% bloom) and to prevent seed development.

- In areas where conventional alfalfa seed production or Adventitious Presence (AP) sensitive seed production is intermingled with forage production, Roundup Ready® Alfalfa must be harvested at or before 10% bloom to help minimize potential pollen flow from Roundup Ready® Alfalfa to conventional alfalfa, and the grower is responsible to control any feral alfalfa resulting from Roundup Ready® Alfalfa use.
- In all other areas, Roundup Ready® Alfalfa must be harvested no later than 50% bloom.

Growers who are unwilling or unable to make these commitments to stewardship should not grow Roundup Ready® Alfalfa.

An in-crop weed control program using Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or the more concentrated Roundup PowerMAX® 3 herbicide, can provide excellent weed control in most situations. A residual herbicide

labeled for use in alfalfa also may be applied post-emergence in alfalfa. Please contact a Bayer Representative, local crop advisor or extension specialist to determine the best option for your situation.

Alfalfa In-Crop Rotation

Avoid planting alfalfa in a field from which an alfalfa crop has recently been removed. Recommended rotational crop sequences fall into two categories—grass crops (e.g., corn and cereal crops) and broadleaf crops.

Roundup Ready® Alfalfa Stand Takeout

Use appropriate, commercially available herbicide treatments in reduced tillage systems, or in combination with tillage, to terminate a Roundup Ready® Alfalfa stand.

If necessary, use tillage and/or additional herbicide application(s) after stand takeout and prior to planting of the subsequent rotational crop to manage any newly emerged or surviving alfalfa.

Note: Roundup® Brand Agricultural Herbicides are not effective for terminating Roundup Ready® Alfalfa stands.



Planting Limitation

Growers must not plant Roundup Ready® Alfalfa in any wildlife feed plots and must not plant Roundup Ready® Alfalfa for the production of sprouts.

Fly-on planting: Growers who choose to fly-on Roundup Ready® Alfalfa seed must control any resulting feral alfalfa.



Roundup Ready® Alfalfa Technology *continued*

Crop Product Export

Grower must lawfully plant Roundup Ready® Alfalfa, direct any product produced from Roundup Ready® Alfalfa seed or crops (including hay and hay products) only to those countries where regulatory approvals have been granted, and grow and manage Roundup Ready® Alfalfa in accordance with the information found in this TUG. In addition, due to the unique cropping practices, do not plant Roundup Ready® Alfalfa in Imperial County, California, until Forage Genetics International, LLC (FGI) grants express permission for such planting. It is a violation of national and international laws to move material containing biotechnology traits across boundaries into nations where import is not permitted.

For more information and the latest updates on Roundup Ready® Alfalfa, please call **1-855-227-8917**.

Management of Roundup Ready® Alfalfa Volunteers in Rotational Crop Fields

- In a timely manner, use recommended and commercially available mechanical and/or herbicidal methods for managing volunteer Roundup Ready® Alfalfa 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 unwilling to implement recommended stand termination practices.

In the event that no known mechanical or herbicidal options are available to manage volunteer Roundup Ready® Alfalfa in the desired rotational crop, you should change to a crop with established volunteer management practices for that rotation.

Note: Roundup® Brand Agricultural Herbicides are not effective for terminating Roundup Ready® Alfalfa volunteers.

Stewardship

All Roundup Ready® Alfalfa growers are required to sign the Technology Stewardship Agreement limited-use license that provides the terms and conditions for the authorized use of the product. The Technology Stewardship Agreement must be signed and a grower license number issued from Bayer or its permitted designee before purchase or use of the seed.

The Technology Stewardship Agreement explicitly prohibits all forms of commercial seed harvest on the stand. Every grower of Roundup Ready® Alfalfa agrees to only lawfully plant Roundup Ready® Alfalfa, and not to plant Roundup Ready® Alfalfa for the production of seed, unless under specific contract to produce seed.



HarvXtra® Alfalfa with Roundup Ready® Alfalfa Technology

HarvXtra® Alfalfa with Roundup Ready® Technology products contain the biotechnology-derived trait developed to help 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® Alfalfa, which enables growers to apply Roundup® Brand Agricultural Herbicides up to five days before cutting for excellent weed control and crop safety.

Planting Limitation

Growers may plant HarvXtra® Alfalfa with Roundup Ready® Technology in the United States with the following states subject to execution of a Seed and Feed Use Agreement: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.



All planting of HarvXtra® Alfalfa with Roundup Ready® Technology in the Western States shall include execution by the grower of a Seed and Feed Use Agreement noting that HarvXtra® Alfalfa with Roundup Ready® Technology can only be used on farm or otherwise only in the U.S.

Growers must not plant HarvXtra® Alfalfa with Roundup Ready® Technology in any wildlife feed plots and must not plant HarvXtra® Alfalfa with Roundup Ready® Technology for the production of sprouts.

Fly-on planting: Growers who choose to fly-on HarvXtra® Alfalfa with Roundup Ready® Technology seed must control any resulting feral alfalfa.

Stewarded HarvXtra® Alfalfa with Roundup Ready® Technology

Growers must direct any product produced from HarvXtra® Alfalfa with Roundup Ready® Technology seed or crops (including hay and hay products) only to United States domestic use. In addition, due to the unique cropping practices, do not plant HarvXtra® Alfalfa with Roundup Ready® Technology in Imperial County, California, until Forage Genetics International, LLC (FGI) grants express permission

for such planting. It is a violation of national and international law to move material containing biotechnology traits across boundaries into nations where import is not permitted. Growers should consult their product purchaser to confirm their buying position for this product. For more information and the latest updates on HarvXtra® Alfalfa with Roundup Ready® Technology, please visit harvxtra.com or call **1-855-227-8917**.

Hay and Forage Management Requirements

HarvXtra® Alfalfa with Roundup Ready® Technology gives growers options to manage for high-quality hay/forage production that include timely cutting to promote high forage quality (i.e., generally before 10% bloom) or slightly delaying harvest for higher tonnage without sacrificing acceptable forage quality while still preventing seed.

- In areas where conventional alfalfa seed production or Adventitious Presence (AP) sensitive seed production is intermingled with forage production, HarvXtra® Alfalfa with Roundup Ready® Technology must be harvested at or before 10% bloom to help minimize potential pollen flow from HarvXtra® Alfalfa with Roundup Ready® Technology to conventional alfalfa, and grower is responsible to control any feral alfalfa resulting from HarvXtra® Alfalfa with Roundup Ready® Technology use.
- In all other areas HarvXtra® Alfalfa with Roundup Ready® Technology must be harvested no later than 50% bloom.

Growers who are unwilling or unable to make these commitments to stewardship should not grow HarvXtra® Alfalfa with Roundup Ready® Technology.

An in-crop weed control program using Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or the newer, more concentrated Roundup PowerMAX® 3 herbicide, can provide excellent weed control in most situations. A residual herbicide labeled for use in alfalfa may also be applied post-emergence in alfalfa. Contact a Bayer Representative, local crop advisor or extension specialist to determine the best option for your situation.

HarvXtra® Alfalfa with Roundup Ready® Technology *continued*

Alfalfa In-Crop Rotation

Avoid planting alfalfa in a field from which an alfalfa crop has recently been removed. Recommended rotational crop sequences fall into two categories—grass crops (e.g., corn and cereal crops) and broadleaf crops.

Crop Product Export

Grower must lawfully plant, grow and manage all HarvXtra® Alfalfa with Roundup Ready® Technology in accordance with the information found in this TUG. Grower must direct any product produced from HarvXtra® Alfalfa with Roundup Ready® Technology seed or crops (including hay and hay products) only to U.S. domestic use. Do not export any product produced from HarvXtra® Alfalfa with Roundup Ready® Technology seed or crops, including hay and hay products.

It is a violation of national and international laws to move material containing biotechnology traits across boundaries into nations where import is not permitted.

For more information and the latest updates on HarvXtra® Alfalfa with Roundup Ready® Technology, please visit the specialty tab at harvxtra.com.

HarvXtra® Alfalfa with Roundup Ready® Technology Stand Takeout

Use appropriate, commercially available herbicide treatments in reduced tillage systems, or in combination with tillage, to terminate a HarvXtra® Alfalfa with Roundup Ready® Technology stand.

If necessary, use tillage and/or additional herbicide application(s) after stand takeout and prior to planting of the subsequent rotational crop, to manage any newly emerged or surviving alfalfa.

Stewardship

All HarvXtra® Alfalfa with Roundup Ready® Technology growers are required to sign the Technology Stewardship Agreement limited-use license which provides the terms and conditions for the authorized use of the product. The Technology Stewardship Agreement must be signed and a grower license number issued from Bayer or its permitted designee before purchase or use of seed.

For the 2024 growing season, growers must direct any product produced from HarvXtra® Alfalfa with Roundup Ready® Technology seed or crops, including hay and hay products, only to U.S. domestic use. All planting of HarvXtra® Alfalfa with Roundup Ready® Technology in the Western States shall include separate execution by the grower of a Seed and Feed Use Agreement (which is a term of the Technology

Note: Roundup® Brand Agricultural Herbicides are not effective for terminating HarvXtra® Alfalfa with Roundup Ready® Technology stands.

Management of HarvXtra® Alfalfa with Roundup Ready® Technology Volunteers in Rotational Crop Fields

In a timely manner, use recommended and commercially available mechanical and/or herbicidal methods for managing volunteer HarvXtra® Alfalfa with Roundup Ready® Technology 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 unwilling to implement recommended stand termination practices.
- In the event that no known mechanical or herbicidal options are available to manage volunteer HarvXtra® Alfalfa with Roundup Ready® Technology in the desired rotational crop, you should change to a crop with established volunteer management practices for that rotation.

Note: Roundup® Brand Agricultural Herbicides are not effective for terminating HarvXtra® Alfalfa with Roundup Ready® Technology volunteers.

Stewardship Agreement) noting that HarvXtra® with Roundup Ready® Technology can only be used on farm or otherwise in the U.S.

The Technology Stewardship Agreement explicitly prohibits all forms of commercial seed harvest on the stand. Every grower of HarvXtra® Alfalfa with Roundup Ready® Technology agrees to only lawfully plant HarvXtra® Alfalfa with Roundup Ready® Technology and not to plant HarvXtra® Alfalfa with Roundup Ready® Technology for the production of seed, unless under specific contract to produce seed.

For more information and the latest updates on HarvXtra® Alfalfa with Roundup Ready® Technology, please visit harvxtra.com or call **1-855-227-8917**.

Weed Management Recommendations

for Roundup Ready® Alfalfa and HarvXtra® Alfalfa with Roundup Ready® Technology

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in HarvXtra® Alfalfa with Roundup Ready® Technology.

Recommendations

- Scout fields before and after each herbicide application.
- To help control flushes of weeds in established alfalfa, make applications of Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide at 22 to 44 fl oz/acre, or Roundup PowerMAX® 3 herbicide at 20 to 40 fl oz/acre, before weeds exceed 4 inches in height and up to five days before cutting.
- Use other approved herbicide products tank mixed or in sequence with Roundup® Brand Agricultural Herbicides as part of a HarvXtra® Alfalfa with Roundup Ready® Technology weed control program, if appropriate for the weed spectrum present.
 - For example, for residual control of grass and small seeded broad leaf weeds early in the season, Warrant Herbicide may be tank mixed with Roundup PowerMAX®, Roundup PowerMAX® II, Roundup PowerMAX® 3 or Roundup WeatherMAX® at a rate of 1.25 to 2 quarts per acre up to or at the 4th trifoliolate stage following emergence of the new stand. Wait a minimum of 20 days after application before cutting for forage or hay, or before open grazing of forage by livestock.
- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

To preserve the quality potential of forage and hay in established stands, apply Roundup PowerMAX® 3 herbicide after weeds have emerged but before alfalfa re-growth interferes with application spray coverage of the target weeds.

Additional Recommendation

It has been reported that some growers of Roundup Ready® Alfalfa may have a limited, temporary crop response where glyphosate application is closely followed by freezing or near-freezing conditions or by large temperature swings.

Because glyphosate-based herbicides are most effective in controlling actively growing weeds, application in those conditions is not recommended.

If freezing or near-freezing temperatures or large temperature swings are forecast within five days after a planned glyphosate application to your Roundup Ready® Alfalfa and/or HarvXtra® Alfalfa with Roundup Ready® Technology, you should delay the application until those conditions are no longer forecast.

Additional Information

Always start with a weed-free field. In no-till and reduced-till systems, apply a Roundup PowerMAX® 3 herbicide burndown application one or two weeks before planting to control existing weeds.

An initial application of 22 to 44 fl oz/acre of Roundup WeatherMAX® herbicide, or 20 to 40 fl oz/acre of Roundup PowerMAX® 3 herbicide, should be applied at or before the three- to four-trifoliolate growth stage.

Note: Due to the genetic diversity of alfalfa, up to 10% of the seedlings are susceptible and will not survive the first application of Roundup® Brand Agricultural Herbicides. The initial application is necessary to eliminate the effects of stand gaps created by loss of plants that are not Roundup Ready® and to ensure adequate spray coverage of emerging weeds before crop canopy interference.

- Applications between cuttings may be applied as a single application or in multiple applications (e.g., two applications of Roundup WeatherMAX® herbicide at 22 fl oz/acre, or two applications of Roundup PowerMAX® 3 herbicide at 20 fl oz/acre). Sequential applications should be at least seven days apart.
 - If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that product on Roundup Ready® Alfalfa and/or HarvXtra® Alfalfa with Roundup Ready® Technology to determine appropriate use rates.
 - Maximum use rates apply to the total amount applied of all products containing glyphosate. Please see the Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide label for more information on maximum use rates.
 - If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide. If using the more concentrated Roundup PowerMAX® 3 herbicide, application rates will be lower than for Roundup WeatherMAX® herbicide.
 - In addition to those weeds listed in the Roundup WeatherMAX® and Roundup PowerMAX® 3 herbicide label booklets, this product can suppress or control the parasitic weed dodder (*Cuscuta spp.*) in Roundup Ready® Alfalfa and/or HarvXtra® Alfalfa with Roundup Ready® Technology. Repeated applications might be necessary for complete control.
 - For tough-to-control weeds or weeds not controlled by Roundup® Brand Agricultural Herbicides, use labeled rates of other approved herbicides, alone or in tank mixtures, with Roundup® Brand Agricultural Herbicides.
- Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be found at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.



Roundup Ready® Sugarbeets

Roundup Ready® Sugarbeet products have in-plant tolerance to the active ingredient glyphosate in Roundup® Brand Agricultural Herbicides, enabling growers to apply labeled Roundup® Brand Agricultural Herbicides from planting through 30 days prior to harvest for excellent weed control, crop safety and preservation of yield potential.



Agronomic Principles in Sugarbeets

Roundup Ready® Sugarbeets provide a mechanism to control weeds at planting and after emergence of the crop.

Planting Limitation

Grower must not plant Roundup Ready® Sugarbeets in any wildlife feed plots.

Crop Product Export

Any product produced from a Roundup Ready® Sugarbeet crop or seed 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 laws to move material containing biotechnology traits across boundaries into nations where import is not permitted.

Stewardship

All Roundup Ready® Sugarbeet growers must sign the Technology Stewardship Agreement limited-use license that provides the terms and conditions for the authorized use of the product. The Technology Stewardship Agreement must be signed and a grower license number issued from Bayer or its permitted designee prior to purchase or use of seed.

Bolting sugarbeets must be rogued or topped in Roundup Ready® Sugarbeet fields.

The grower agrees to transport and plant Roundup Ready® Sugarbeets only for the production of a root crop and not for seed production, unless under specific contract to produce seed.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in Roundup Ready® Sugarbeets.

Sugarbeets are extremely sensitive to weed competition for light, nutrients and soil moisture and can lose yield potential rapidly if weeds are not controlled early. Sugarbeet weed control research suggests that sugarbeets need to be kept weed-free for the first eight weeks of growth to protect yield potential. Therefore, weeds must be controlled when they are small and before they compete with Roundup Ready® Sugarbeets (before weeds exceed crop height). More than one in-crop herbicide application will be required to help control weed infestations to protect yield potential as Roundup® Brand Agricultural Herbicides have no soil residual activity.

A post-emergence weed control program using Roundup WeatherMAX®, Roundup PowerMAX® or Roundup PowerMAX® II herbicide, or the more concentrated Roundup PowerMAX® 3 herbicide, can provide excellent weed control in most situations. A residual herbicide labeled for use in sugarbeets also may be applied preplant, pre-emergence or post-emergence in Roundup Ready® Sugarbeets. Please contact your sugarbeet seed representative, local crop advisor or extension specialist to determine the best option for your situation.

Recommendations

- Start with a clean field by using a burndown herbicide application, residual herbicide or tillage, making sure weeds are controlled at planting.
- Early season weed control is critical to protect sugarbeet yield potential. Apply the first in-crop application of Roundup WeatherMAX® herbicide at a minimum of 22 fl oz/acre or Roundup PowerMAX® 3 herbicide at a minimum of 20 fl oz/acre while weeds are less than 2 inches in height.
- Follow with additional post-emergence in-crop application of Roundup WeatherMAX® herbicide at a minimum of 22 fl oz/acre or

Roundup PowerMAX® 3 herbicide at a minimum of 20 fl oz/acre for additional weed flushes before weeds exceed 4 inches in height.

- Use mechanical weed control, cultivation and/or residual herbicides where appropriate.
- Use additional herbicide mechanisms of action, residual herbicides and/or mechanical weed control in other Roundup Ready® crops you rotate with Roundup Ready® Sugarbeets.

Additional Information

- Add ammonium sulfate at a rate of 17 lbs/100 gallons of spray solution with Roundup® Brand Agricultural Herbicides to help maximize product performance. Tank mixtures of Bayer brand labeled glyphosate herbicides with fungicides, insecticides, micronutrients or foliar fertilizers are not recommended. Sequential applications should be at least 10 days apart.
- For tough-to-control weeds, or weeds not controlled by Bayer brand-labeled glyphosate herbicides, use labeled rates of other approved herbicides, alone or in tank mixtures, with Bayer brand-labeled glyphosate herbicides.
 - For example, for residual control of grass and small seeded broad leaf weeds early in the season, Warrant® Herbicide may be tank mixed with Roundup PowerMAX®, Roundup PowerMAX® II, Roundup PowerMAX® 3 or Roundup WeatherMAX® at a rate of 1.25 to 2 quarts per acre from the 2 leaf stage up to the 8 leaf stage, with the 4 leaf stage being ideal timing. Allow at least 7 days between sequential applications.
- If using Roundup PowerMAX® or Roundup PowerMAX® II herbicide, application rates are the same as for Roundup WeatherMAX® herbicide.
- If using another approved glyphosate agricultural herbicide, you must refer to the label booklet or applicable supplemental labeling for the use of that product on Roundup Ready® Sugarbeets for appropriate use rates.
- Maximum use rates apply to the total amount applied of all glyphosate-containing products. Please see the Roundup WeatherMAX® or Roundup PowerMAX® 3 herbicide label for more information on maximum use rates.
- Report any incidence of repeated non-performance of labeled glyphosate agricultural herbicides on a particular weed to the appropriate company representative, local retailer or county extension agent.

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling for Roundup® Brand Agricultural Herbicides, must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.



BAYER SWEET CORN TECHNOLOGIES

2024

SWEET CORN

BAYER

BAYER SWEET CORN TECHNOLOGIES

Bayer Sweet Corn Technologies for 2024



Performance Series® Sweet Corn contains Cry1A.105, Cry2Ab2 and Cry3Bb1 proteins from *Bacillus thuringiensis* (*B.t.*) that together control European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, fall armyworm, stalk borer, lesser corn stalk borer, western corn rootworm, northern corn rootworm and Mexican corn rootworm and control or suppress corn earworm.



This product also contains Roundup Ready® 2 Technology that provides crop safety to in-crop applications of Roundup PowerMAX®, Roundup PowerMAX® II and Roundup WeatherMAX® herbicides, or the more concentrated Roundup PowerMAX® 3 herbicide, when applied according to label directions.

Performance Series® Sweet Corn



Planting Requirements

Read and follow the IRM Guide on the bag tag prior to planting Performance Series® Sweet Corn.

- **Do not repackage seeds.** Each package of seeds includes important legal requirements on the label. Seeds must remain in their original packaging and must not be further subdivided.
- **Post-Harvest IRM Requirements:** Crop destruction must occur no later than 30 days following harvest, but preferably within 14 days. The allowed crop destruction methods are rotary mowing, discing or plowing down or (for home garden use) by chopping up the stalks using home garden tools, such as a hoe.
- **Identity Preserved (IP) Production:** All harvested ears must be stored in areas where the identity of the ears can be preserved.

All growers in Idaho and Oregon who intend to plant Performance Series® Sweet Corn must contact Seminis Vegetable Seeds, Inc. at 866-334-1056 to order Performance Series® Sweet Corn seed.

Performance Series® Sweet Corn may only be sold into the Treasure Valley area of Idaho and Oregon (Ada, Owyhee, Canyon, Gem, Payette and Washington counties in Idaho and Malheur County in Oregon) beginning on January 1 and ending on February 15 of each calendar year. Growers must inform Seminis Vegetable Seeds, Inc. of the location(s) of their Performance Series® Sweet Corn field(s) to ensure pinning prior to delivery of Performance Series® Sweet Corn seed.

Compliance Monitoring Program

The EPA requires Bayer to take corrective measures in response to a finding of grower IRM non-compliance. As mandated by the EPA, Bayer or an approved agent of Bayer, must monitor IRM requirements. The Bayer Technology Stewardship Agreement, signed by the grower,

requires that, upon request by Bayer or its approved agent, a grower must provide the location of all fields planted with Performance Series® Sweet Corn. The grower must cooperate fully with any field inspections and allow Bayer or an agent of Bayer to inspect all fields to ensure post-harvest crop destruction. All inspections will be performed at a reasonable time and arranged in advance with the grower so the grower can be present.

Product Marketing and Stewardship Requirements

This product has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotechnology traits across boundaries into nations where import is not permitted. All growers are responsible for talking to their produce handler or purchaser to confirm their buying position for this produce so the marketing requirements can be met.

Performance Series® Sweet Corn Insect Pest Control

Performance Series® Sweet Corn provides control or suppression of the most important above-ground insect pests of sweet corn, including corn earworm, fall armyworm, European corn borer, southwestern corn borer, sugarcane borer, stalk borer, lesser stalk borer and southern cornstalk borer. Bayer recommends that you continue to scout your fields as usual, and if these insects are present, an appropriate insecticide should be used according to label directions.

Performance Series® Sweet Corn also provides control of below-ground feeding from western corn rootworm, northern corn rootworm and Mexican corn rootworm larvae, and the seed is treated for control of wireworms, white grubs, seed corn maggot and black cutworm.

Performance Series® Sweet Corn does not control silk flies, adult corn rootworm beetles, sap beetles, western bean cutworm, stinkbugs and other insect pests not listed above. It is recommended that you scout and spray according to label recommendations to control those pests.

Performance Series® Sweet Corn provides growers with a dual mode of action for many above-ground insect pests, including corn earworm. Performance Series® Sweet Corn can control or suppress corn earworm under typical infestation levels, but supplemental insecticide applications may be required when corn earworm populations are above economic thresholds to ensure quality ears at harvest. Protection from corn earworm must be coupled with thorough scouting and spray programs to help maximize marketable yield potential.

If supplemental insecticide applications are necessary for control of high levels of corn earworm, rotating insecticide mode of action will help reduce the risk of insect pests developing chemical resistance. For more information, visit irac-online.org/modes-of-action.

- For target pests, no spray prior to silking.
- After silking, schedule sprays based on insect flight activity and follow state recommendations under high infestation ratings.
- Under heavy insect pressure, spray intervals may have to be reduced.
- Monitor for secondary pests, including sap beetles, stink bugs, western bean cutworm and corn silk flies.

Weed Management

FOLLOW ALL PESTICIDE PRODUCT LABELING. If there is any conflict between these recommendations and applicable pesticide product labeling, the pesticide product labeling controls. Follow the recommendations below to help minimize the risk of developing glyphosate-resistant weed populations in a Roundup Ready® 2 Technology System.

The Roundup Ready® 2 Technology System enables flexibility, broad-spectrum weed control and proven crop safety. Growers can select the weed control program that best fits the way they farm and that provides them the greatest benefit. Options include the use of a residual herbicide with Roundup® Brand Agricultural Herbicides, tank mixing other herbicides with Roundup® Brand Agricultural Herbicides where appropriate and a total post-emergence program.

Corn yield is especially sensitive to early season weed competition, so control weeds before they become competitive. The Roundup Ready® 2 Technology System provides a mechanism to control weeds at planting and once they emerge. Failure to control weeds with the right rate, at the right time and with the right product can lead to increased weed competition, weed escapes, the potential

for selecting for herbicide resistance and possible decreased yields. Use diverse weed management tools that include multiple herbicide mechanisms of action—if appropriate—alone or in tank mixes with Roundup® Brand Agricultural Herbicides based on the weed spectrum in the field and according to label directions.

Recommendations

- Start clean with a burndown herbicide or tillage. Early season weed control is critical to yield.
- Apply a pre-emergence residual herbicide at the appropriate application rate tank mixed with 16 to 22 fl oz/acre of Roundup WeatherMAX® herbicide or 15 to 20 fl oz/acre of Roundup PowerMAX® 3 herbicide before weeds exceed 4 inches in height.
- Follow with a post-emergence in-crop application of Roundup WeatherMAX® herbicide with at 16 to 22 fl oz/acre or Roundup PowerMAX® 3 herbicide at 15 to 20 fl oz/acre for additional weed flushes before they exceed 4 inches in height.
- Roundup PowerMAX® 3 herbicide may be tank mixed with other herbicides for post-emergence weed control.
- Report any incidence of repeated non-performance of Roundup® Brand Agricultural Herbicides or other glyphosate products on a particular weed to the appropriate company representative, local retailer or county extension agent.

Additional Information

Make sure the intended use of all products is approved in your state. Do not use this information as the basis for any glyphosate product other than Roundup® Brand Agricultural Herbicides. All use of Roundup® Brand Agricultural Herbicide products must be in accordance with the current product label. Nothing in this TUG should be construed as a substitute for reading all product labeling.

Performance Series® Sweet Corn growers are required to destroy any stalks that remain in the field following harvest via rotary mowing, discing, plow-down or (for home garden use) by chopping up the stalks using home garden tools, such as a hoe, within one month of harvest, but preferably within 14 days.

Various weed biotypes are known to be resistant to glyphosate. For the current weed control recommendations for glyphosate-resistant weed biotypes, please call **1-866-992-2937**. A complete list of specimen labels can be located at cdms.net/Label-Database. Approved labels, including any applicable supplemental labeling, for Roundup® Brand Agricultural Herbicides must be in the possession of the user at the time of pesticide application and can be obtained by calling **1-866-992-2937** or by contacting your State Pesticide Lead Agency for more information.



Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Technology/Stewardship Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation and agreement to comply with the most recent stewardship requirements.



Subject to final commercialization decisions, availability of the Preceon™ Smart Corn System is expected for the 2024 growing season. **Product Use Statement:** Enlist E3® soybeans contain the Enlist E3 trait that provides crop safety for use of labeled over-the-top applications of glyphosate, glufosinate and 2,4-D herbicides featuring Colex-D® technology when applied according to label directions. Following burn-down, the only 2,4-D containing herbicide products that may be used with Enlist® crops are products that feature Colex-D technology and are expressly labeled for use on Enlist crops. 2,4-D products that do not contain Colex-D technology are not authorized for use in conjunction with Enlist E3 soybeans. **Warning:** Enlist E3 soybeans are tolerant of over-the top applications of glyphosate, glufosinate, and 2,4-D. Accidental application of incompatible herbicides to this variety could result in total crop loss. When using 2,4-D herbicides, grower agrees to only use 2,4-D products that contain Colex-D technology authorized for use in conjunction with Enlist E3 soybeans. Always read and follow herbicide label directions prior to use.

*Commercialization is dependent on multiple factors, including successful conclusion of the regulatory process. The information presented herein is provided for educational purposes only, and is not and shall not be construed as an offer to sell, or a recommendation to use, any unregistered pesticide for any purpose whatsoever. It is a violation of federal law to promote or offer to sell an unregistered pesticide.

YOU MUST SIGN A TECHNOLOGY AGREEMENT, READ THE PRODUCT USE GUIDE PRIOR TO PLANTING AND FOLLOW HERBICIDE RESISTANCE MANAGEMENT (HRM) REQUIREMENTS.

IMPORTANT: Produce Marketing and Stewardship Requirements for Performance Series® sweet corn: This product has been approved for import into key export markets with functioning regulatory systems. 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. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. It is the grower's responsibility to talk to their produce handler or purchaser to confirm their buying position for this produce so that the marketing requirements can be met.

U.S. Herbicide Information for Performance Series® sweet corn: Roundup PowerMAX™, Roundup PowerMAX® II* and Roundup WeatherMAX® herbicides are approved for use on Performance Series® sweet corn (containing Roundup Ready® 2 Technology) in all U.S. states, the District of Columbia and Puerto Rico. If the directions for use on sweet corn with Roundup Ready® 2 Technology (which includes Performance Series® sweet corn) are not listed in the product label that is attached to the product you purchased, contact your Bayer representative.

*Roundup PowerMAX® and Roundup PowerMAX® II are only approved for use in the U.S. Roundup PowerMAX® II is not registered in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or representative for the product registration status in your state.

Bayer is a member of Excellence Through Stewardship® (ETS). Bayer products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Bayer's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. Commercialized products have been approved for import into key export markets with functioning regulatory systems. 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. 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. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.

XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent volatility reduction adjuvant). For approved tank-mix products (including VRAs and DRAs), nozzles and other important label information visit XtendiMaxApplicationRequirements.com. The transgenic soybean event in the Enlist E3® soybeans is jointly developed and owned by Corteva Agriscience and M.S. Technologies, L.L.C.®, Enlist, Enlist E3, and the Enlist E3 logo and Colex-D are trademarks of Corteva Agriscience and its affiliate companies.

All growers in Idaho and Oregon who intend to plant Performance Series® sweet corn must contact Seminis Vegetable Seeds, Inc. at 866-334-1056 to order Performance Series® sweet corn seed. Performance Series® sweet corn may only be sold into the Treasure Valley area of Idaho and Oregon (which consists of Ada, Canyon, Gem, Owyhee, Payette and Washington counties in Idaho and Malheur County in Oregon) during the time period beginning on January 1 and ending on February 15 of each calendar year. Growers must inform Seminis Vegetable Seeds, Inc. of the location(s) of their Performance Series® sweet corn field(s) to ensure pinning prior to delivery of Performance Series® sweet corn seed.

Performance Series® sweet corn Insect Resistance Management (IRM) – Post-Harvest Requirements: Crop destruction must occur no later than 30 days following harvest, but preferably within 14 days. The allowed crop destruction methods are: rotary mowing, discing, or plowing down, or, for home garden use only allowed in the U.S., by chopping up the stalks using home garden tools such as a hoe. Crop destruction methods should destroy any surviving resistant insects.

Applicators must check XtendiMaxApplicationRequirements.com no more than 7 days before application of this product for additional labeling, including state restrictions. Where applicable, users must comply with additional requirements found on this website.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. It is a violation of federal and state law to use any pesticide product other than in accordance with its labeling. NOT ALL formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans. NOT ALL formulations of dicamba, glyphosate or glufosinate are approved for in-crop use with products with XtendFlex® Technology.

FOR COTTON TREATED FOR MARKET YEAR 2023, EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products containing the active ingredients: **BASIC** Offering: fluroxystrobin, prothioconazole, metalaxyl, myclobutanil, and penflufen. **STANDARD** Offering: fluroxystrobin, prothioconazole, metalaxyl, myclobutanil, penflufen, and imidacloprid. **ELITE** plus Copeo® Offering: fluroxystrobin, prothioconazole, metalaxyl, myclobutanil, penflufen, imidacloprid, and fluropyram.

ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with products with XtendFlex® Technology.

FOR SOYBEANS SEED TREATMENT PRODUCTS APPLIED DOWNSTREAM, EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products containing the active ingredients: **BASIC** Offering: metalaxyl, penflufen and prothioconazole. **STANDARD** Offering: metalaxyl, penflufen, prothioconazole and imidacloprid. **FOR UPSTREAM TREATED SOYBEANS, EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING** is a combination of separate individually registered products containing the active ingredients: **BASIC** Offering: metalaxyl, fluxapyroxad, and pyraclostrobin. **STANDARD** Offering: metalaxyl, fluxapyroxad, pyraclostrobin and imidacloprid.

FOR CORN, EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products containing the active ingredients: **BASIC** plus Poncho®/VOTIVO® Offering for corn: metalaxyl, ethaboxam, prothioconazole, fluroxystrobin, clothianidin, *Bacillus firmus* I-1582. **ELITE** plus Poncho®/VOTIVO® Offering for corn: metalaxyl, ethaboxam, clothianidin, and *Bacillus firmus* I-1582; prothioconazole and fluroxystrobin at rates that suppress additional diseases. **BASIC** Offering for corn: metalaxyl, prothioconazole, fluroxystrobin, and clothianidin. **ELITE** Offering for corn: metalaxyl, ethaboxam, and clothianidin; and prothioconazole and fluroxystrobin at rates that suppress additional diseases. BioRise® Corn Offering is the on-seed application of BioRise® 360 ST. **BioRise® Corn Offering** is included seamlessly across offerings on all class of 2017 and newer products.

Not all products are registered in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited.

FOR COTTON TREATED FOR MARKET YEAR 2022 OR PRIOR, EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products containing the active ingredients: **BASIC** Offering: fluroxystrobin, pyraclostrobin, metalaxyl, and myclobutanil. **STANDARD** Offering: fluroxystrobin, pyraclostrobin, metalaxyl, myclobutanil, and imidacloprid. **ELITE** plus Poncho®/VOTIVO® Offering: fluroxystrobin, pyraclostrobin, metalaxyl, myclobutanil, imidacloprid, clothianidin, and *Bacillus Firmus* I-1582.

Please review each seed tag to determine active ingredients in the product offering on the seed.

The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Not all products are approved in all states.

Alloy™ and Connect™ are trademarks of M.S. Technologies, L.L.C., West Point, IA. Please read the M.S. Technologies, L.L.C. Use Restriction Agreement located at: <http://www.mstechseed.com/use-restriction-agreement/>. See the IRM/Grower Guide for additional information. Always read and follow IRM requirements.

B.t. products may not yet be registered in all states. Check with your seed brand representative for the registration status in your state.

Refuge seed may not always contain the DroughtGard® trait. **Roundup Technology®** includes glyphosate-based herbicide technologies.

IMPORTANT IRM INFORMATION: Certain products are sold as RIB Complete® corn blend products, and do not require the planting of a structured refuge except in the Cotton-Growing Area where corn earworm is a significant pest. Products sold without refuge in the bag (non-RIB Complete) require the planting of a structured refuge. **See the IRM/Grower Guide for additional information. Always read and follow IRM requirements.**

Roundup Ready® Technology contains genes that confer tolerance to glyphosate. **Roundup Ready® 2 Technology** contains genes that confer tolerance to glyphosate. **LibertyLink® Technology** contains genes that confer tolerance to glufosinate. **Roundup Ready® Flex Technology** contains genes that confer tolerance to glyphosate. **Roundup Ready 2 Xtend® soybeans contain genes that confer tolerance to glyphosate and dicamba. Products with XtendFlex® Technology contains genes that confer tolerance to glyphosate, glufosinate and dicamba. Plants that are not tolerant to glyphosate, dicamba, and/or glufosinate may be damaged or killed if exposed to those herbicides.** Contact your seed brand dealer or refer to the Bayer Technology Use Guide for recommended weed control programs.

Insect control technology provided by **Vip3A** is utilized under license from Syngenta Crop Protection AG. Aeriis® and XtendiMax® are restricted use pesticides. Not all products are registered for use in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or representative for the product registration status in your state. Channel® is a registered trademark of Channel Bio, LLC. Herculex® is a registered trademark of Dow AgroSciences LLC. Agrisure Viptera® is a registered trademark of a Syngenta group company. Beyond®, Clearfield®, Copeo®, ILeVO®, Liberty®, LibertyLink logo®, LibertyLink®, Poncho® and Votivo® are trademarks of BASF Corporation. Respect the Refuge and Corn Design® and Respect the Refuge® are registered trademarks of National Corn Growers Association. Accelaron®, Aeriis®, Asgrow®, BioRise®, Bollgard II®, Bollgard®, DEKALB®, DroughtGard®, Evergol®, EverGol®, Fontanelle Hybrids®, Gold Country Seed®, H Hubner and Design™, Jung Seed Genetics™, Kruger Seeds™, Lewis Hybrids™, Performance Series & Design®, Performance Series®, Preceon™, Raxil®, Rea Hybrids™, Respect the Refuge and Cotton Design®, RIB Complete®, Roundup PowerMAX®, Roundup Ready 2 Technology and Design®, Roundup Ready 2 Xtend®, Roundup Ready 2 Yield®, Roundup Ready®, Roundup Technology®, Roundup WeatherMAX and Design®, Roundup WeatherMAX®, Roundup Xtend™, RT 3®, SmartStax®, Specialty Hybrids™, Stewart Seeds™, Stone Seed™, ThryvOn™, Trecepta®, TruFlex®, TruFlex® canola with Roundup Ready® and LibertyLink® Technologies, VaporGrip®, Vistive®, VT Double PRO®, VT Triple PRO®, VT4PRO™, VT4PRO™, Warrant®, WestBred and Design®, WestBred®, XtendFlex® and XtendiMax® are trademarks of Bayer Group. For additional product information call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at www.BayerCropScience.us. Bayer CropScience LP, 800 North Lindbergh Boulevard, St. Louis, MO 63167. ©2023 Bayer Group. All rights reserved.

