This 2018 Product Use Guide provides technical information about insect control and herbicide tolerant products and sets forth requirements and guidelines for the use of these products. Please read all of the information pertaining to the technology you will be using, including stewardship and related information.

This technical guide is not a pesticide product label. It is intended to provide additional information and to highlight approved uses from certain product labels. Read and follow all precautions and labeling for the agricultural herbicide product you are using, as well as any other pesticide products.

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If you have any questions, contact your local sales professional.
Stewardship Overview

A Message about Stewardship

When we introduce a new product, we are in it for the long haul. Our philosophy of product stewardship means responsible management of the life cycle of our technologies every step of the way – from initial research to the discontinuation of a product – for maximum product value, benefits, and longevity. That’s why we require that all growers comply with regulations, policies, and crop management strategies specific to the product.

Growers that plant seed with biotech traits agree in the Seed and Technology Use Agreement (TUA) and Terms and Conditions of Purchase to adhere to the stewardship requirements described in this guide, including, without limitation:

- Following directions of use on all seed, pesticide, or other product labels.
- Implementing Insect Resistance Management (IRM) practices, before and after planting, for specific biotech traits as required by the U.S. Environmental Protection Agency (EPA).
- For crops or material containing biotech traits, confirming trait acceptance and intended uses and destinations with grain handlers prior to delivery, or using those products on-farm.
- Not sending seed or other material containing biotech traits into countries where the product is not allowed, including through a third party.

- Following any additional stewardship requirements necessary for a particular product (e.g., grain or feed use restrictions and geographical planting restrictions).

Growers are responsible for following the applicable stewardship guidelines and weed resistance management guidelines as set forth in this guide.

Why is Stewardship Important?

Proper stewardship of products is important because it offers benefits to growers, including:

- Signing the TUA permits access to the germplasm and the biotech trait technologies in its seed products.
- Following IRM requirements limits development of insect resistance to incorporated plant protection technologies, and helps to maintain the long-term durability of these technologies.
- Using seed products solely for producing a single commercial crop encourages the development of better, higher-yielding germplasm and additional technologies and innovations, further improving agricultural productivity.

Our Commitment to Excellence Through Stewardship®

DuPont Pioneer is a member of Excellence Through Stewardship® (ETS). Products are commercialized in accordance with ETS Product Launch Stewardship Guidance and in compliance with the policies regarding stewardship of those products. Crops and materials containing biotech traits may only be exported to or used, processed, or sold in jurisdictions where all necessary regulatory approvals have been granted for those crops and materials. It is a violation of national and international laws to move materials containing biotech traits across borders into jurisdictions where their import is not permitted. Growers should discuss these issues with their purchaser or grain handler to confirm the purchaser or handler’s position on products being purchased. For further information on the approval status of biotech traits, please visit www.biotradestatus.com.

Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.
When you purchase any variety or trait, you do so under contract and agree to limitations. By using seed supplied in connection with a Technology Use Agreement, you agree to the fact that the seed – and technology within that seed – includes subject matter owned by DuPont, or licensed from a third party, which is protected under U.S. intellectual property laws. Under this contract, you are agreeing not to bin run or save your seed.

By abiding by your Technology Use Agreement, you are helping us continue to invest in advances in genetics and technology that bring forward new research discoveries. These discoveries ultimately help you increase production and meet new pest and production challenges.
Coexistence

For decades, multiple agricultural systems have successfully coexisted in the United States and around the world, from initial production through supply chains to the ultimate end users. Over time, management practices to facilitate these different agricultural systems have developed and have been continuously improved so that high purity and high quality seed and grain is available to help growers, handlers, and end-users maximize opportunities and take full advantage of the wide variety of technologies available to each. One example of successful coexistence is the production of similar commodities in close proximity, such as field corn, sweet corn, white corn, and popcorn. Coexistence strategies should be designed to meet market requirements using science-based industry standards and management practices, and should be flexible to facilitate diverse options and choice for growers and the food and feed supply chain. This flexibility also should include the ability of coexistence strategies to be modified as changes in products, markets, or practices take place. The on-going success of coexistence has depended upon cooperation, communication, flexibility, and mutual respect for each cropping system among the entire value chain. Over the years, growers have adapted to changes and innovation in agriculture by using new farm management practices, new technologies, and other appropriate practices and can continue to do so into the future.

It is therefore incumbent on all growers to consider and implement management practices to satisfy the relevant marketing and stewardship practices required by the desired end market. By choosing to grow any crop, growers are inherently agreeing to use practices appropriate to ensure the integrity and marketability of those crops for the intended market and that suitable management and stewardship practices are being implemented, considering each neighbors’ farm management. This is true regardless of the particular market being served, whether it is specialty crops, identity-preserved crops, organically-produced crops, conventionally produced crops or crops with biotech traits.

For products receiving premiums, the grower is producing a crop supported by a special market price, and therefore assumes responsibility for meeting any applicable market specifications to receive the applicable premium price from that market. Likewise, for products containing biotech traits that may not yet be approved in certain export markets or have special considerations related to production practices (e.g., herbicide application, specialty characteristics), the grower assumes responsibility for the stewardship conditions and implementation related to use of such technologies. Even though the ultimate responsibility is on the grower producing a crop for a particular market to implement appropriate stewardship practices and requirements, including those communicated by a seed provider, it is also each grower’s responsibility to communicate with and be aware of the planting intentions of his or her neighbors to gauge the need for any appropriate management and coexistence practices. By communicating what is being grown on neighboring fields and the potential implications of those crops on each growers’ management decisions, growers can utilize some of the following coexistence considerations to limit potential conflicts, while acknowledging the generally recognized and accepted occurrence of the movement of incidental amounts of pollen:

- What is the crop biology and what are the product characteristics, specifically considering whether or not the crop is self-pollinating or cross-pollinating;
- What options exist to arrange or select planting locations and fields to help minimize the potential for outcrossing to or from a particular crop, by considering, for example, appropriateness of buffer rows, environmental windbreaks, or land devoted to conservation;
- What options exist related to staggering planting times to help temporally isolate a given crop from the potential of unintended outcrossing;
- What are cleaning and handling options for a particular crop that could help to minimize the potential for inadvertent comingling during planting, harvesting or cleaning activities, considering the use of planters, combines, seed storage bins, seed hopper/boxes, transportation vehicles, and other equipment pre- and post-harvest; and
- Understanding characteristics of applied technologies or pest management tools and the potential impact to different types of crops planted in the vicinity.

In today’s agricultural marketplace, growers share common goals of increasing productivity and profitability, and through planning and proactive management measures, coexistence can help all growers meet their productivity goals and stewardship responsibilities while respecting their neighboring farming operations.
**Steps for Stewardship of Treated Seed**

**Follow Directions**
Follow directions on treated seed container labeling for handling, storage, planting and disposal practices.

**Minimize Dust**
Use advanced seed flow lubricants that minimize dust.

**Eliminate Weeds**
Eliminate flowering plants and weeds in and around the field prior to planting.

**BeeAware**
At planting, be aware of honey bees and hives located near the field, and communicate with beekeepers when possible.

**Clean and Remove**
Completely remove all treated seed left in containers and equipment used to handle harvested grain, and dispose of it properly. Keep all treated seed out of the commodity grain channels.

For detailed information about stewardship of treated seed, check out [seed-treatment-guide.com](http://seed-treatment-guide.com)
Seed treatments, including fungicides, insecticides, nematicides, and amendments, play a critical role in agriculture and the production of a healthy crop. In addition to helping manage against early season pests and diseases, they serve as a viable alternative to foliar and soil applications. Seed treatment management and responsible stewardship play a vital role in sustaining our environment while maximizing crop health. Responsible stewardship practices help maintain seed and seed treatment integrity, which keeps the active ingredient on the seed to achieve the maximum crop health benefit for the investment. In addition, these practices help minimize the potential for adverse effects on producers and the environment, including pollinators, which may be present at the time of planting.

DuPont is committed to our Core Values of Safety & Health, Environmental Stewardship, Respect for People and Highest Ethical Behavior. In addition, the Long Look philosophy states that we are committed to providing helpful management suggestions to our customers. The following best management practice suggestions are in the spirit of our Core Values and Long Look.

For a short video on treated seed stewardship, click here or type into your web browser the following: https://www.youtube.com/watch?v=pGGviLUNagw

Handling
- Always read and follow the label directions and recommendations for proper handling and use of treated seed and seed treatments.
- Use personal protection equipment as recommended on the product label or seed tag.
- Follow all safety precautions as indicated on the label.seed tag.
- Transport and transfer treated seeds safely and in a manner that eliminates the risk of spill and dust.

For more information on pollinator health visit: http://honeybeehealthcoalition.org

Planting
- Always follow planter manufacturer recommendations and avoid excess use of talc and graphite.
- Be aware of the environment in and around your field, taking note of nearby bee hives and flowering plants and weeds, which could be attractive to pollinators.
- Limit dust movement from seed packages containing seed treatment. For example, consider factors such as wind speed and direction, and avoid shaking the bottom of the treated seed bag when filling planting equipment.
- Do not transfer treated seed next to active bee hives, at field margins, and adjacent to flowering plants and vegetation.
- For pneumatic planters, direct the exhaust toward the soil surface.
- Ensure all seeds are planted/incorporated into the soil at proper planting depth.
- Follow labeling requirements for disposal/use of unused seed.

Disposal and Cleanup
For a short video on treated seed disposal and cleanup, click here or type into your web browser the following: https://www.youtube.com/watch?v=2XNG_SYXJbA
- Properly dispose of seed packaging/containers in accordance with state and local regulations and container return policy.
- Clean planting equipment in a manner that minimizes dust.
- Avoid cleaning planting equipment next to active bee hives, at field margins and adjacent to flowering plants and vegetation.

DuPont is an active participant in industry stewardship best practices through collaboration with Crop Life America, American Seed Trade Association, Agricultural Biotechnology Stewardship Technical Committee.

Additional best management practices can be found: http://seed-treatment-guide.com/
Growers have widely embraced herbicide tolerance technology because it provides convenient, effective, and economical weed control in crops. However, intensive long term use of any single herbicide mode of action can lead to the development of weeds resistant to that mode of action. Integrated management practices can minimize this risk, while at the same time providing growers with a more consistent and effective weed control program.

**Herbicide Groups**

The Weed Science Society of America categorizes herbicides into different groups based on their mode of action. If a given weed population has plants resistant to a herbicide in one group, that weed population may not be able to be effectively managed using only other herbicides in that group. However, that weed population may be able to be managed with a different herbicide from a different herbicide group, whether alone or in combination with a herbicide from that same group, or by using other weed management practices, such as mechanical practices. Note that herbicide classification may not, in all circumstances, address weeds resistant to particular herbicides. Consult your local sales professional, state cooperative extension service, professional consultants, or other qualified individuals to discuss appropriate actions to address specific weeds that appear to show resistance to a particular herbicide.

**Weed Management Techniques and Guidelines**

Using varied weed control methods is recommended to help slow the development of resistant weed populations. Such varied weed control methods may include using multiple herbicides that act on weeds through different modes of action with similar spectrum, use of tillage or other mechanical methods, and other practices. Use of tillage must be balanced against possible soil and water conservation issues that aggressive tillage may cause. When using herbicides, studies have shown that using the herbicide in compliance with label directions and at labeled rates is important to slow the development of resistant weeds. Also, scouting for surviving weeds after herbicide application can help identify resistant weeds and provide valuable information on how to manage resistance by using different weed management methods. If resistant weeds are identified, one of the most effective ways to inhibit the development of resistant populations or spread of resistance is to use methods that prevent weeds from reproducing by seed or through vegetative propagation. It is also important to clean equipment between sites, as this slows the spread of weed seed between fields.

When using herbicide resistant crops it is important to start with a clean field, either by using tilling or a burndown herbicide application. In general:

- Begin the season with a clean, weed-free field.
- Use multiple weed control techniques, such as multiple herbicides with different modes of action, tillage, or other mechanical weed control techniques, considering soil and water conservation issues.
- Use herbicides at their proper rates at the appropriate times and following all label directions.
- If surviving weeds are found, control those weeds before they can set seed or otherwise reproduce.

**Glyphosate-Resistant Weeds**

Growers should be aware of and proactively manage possible glyphosate-resistant weeds in any weed control program. If a weed is known to have resistance to glyphosate, a resistant population of that weed will not be controlled by labeled rates and timings of glyphosate. Glyphosate herbicides may not be warranted to cover failure to control glyphosate-resistant weed populations; other weed management practices should be employed to control a population of glyphosate-resistant weeds. For current weed control recommendations for particular glyphosate-resistant weeds, contact your sales professional.

Repeated failure of a specific herbicide to control a particular weed should be reported to your sales professional, as well as the herbicide manufacturer, local retailer, or county extension agent. Approved labels, including supplemental labeling, for herbicides must be in possession of the user at the time of pesticide application and can be obtained by contacting your state’s pesticide lead agency.

DuPont supports the Take Action effort. 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 them manage herbicide-resistant weeds. The Take Action effort encourages you to develop a proactive strategy to manage herbicide-resistant weeds that incorporates a diverse set of controls. To find out more about how you can take action, visit www.TakeActionOnWeeds.com, or contact your local extension office.

**Glyphosate Endangered Species Initiative Requirement**

Before applying any glyphosate-based herbicide (unless the only application will be ground application at a rate of less than 3.5 lbs of glyphosate a.e./A), growers must visit the website www.pre-serve.org to determine whether any mitigation requirements apply to application of glyphosate as it relates to endangered species. If you are unable to access the website, call 1-800-332-3111 for assistance. Growers must follow any applicable mitigation requirements, which are appropriate for all applications of glyphosate-based herbicides to all crop lands.
Corn Rootworm Management

The Problem
Corn rootworms have been a primary pest for corn growers for decades, causing an estimated 1 billion dollars in yield and control costs annually. Heavy reliance on individual control tactics, such as insecticides (soil-applied and adult sprays) have led to the development of resistant populations. Rootworms also have developed resistance to cultural practices. Crop rotation has even been rendered occasionally ineffective in some areas due to behavioral changes like egg-laying in soybean (western corn rootworm) and delayed egg hatch in corn (extended diapause in northern corn rootworm). Rootworms have repeatedly demonstrated a remarkable ability to adapt to management tactics. The development of Bt corn for corn rootworm control included another valuable tool for controlling these pests, but like any control tactic, repeated use of the same technology over time may lead to resistance.

Identifying Rootworm Resistance in Bt Corn
Rootworm resistance to some Bt corn products has been documented. Unfortunately, it can be difficult to recognize resistance in the early stages of development. High levels of root injury or lodging on Bt-protected products are often only the first clue; plant injury alone is not definitive proof of resistance. Research data suggests that under very large rootworm populations, Bt-protected plants can sustain significant root feeding in the absence of resistance due to the non-high dose nature and expression patterns of the Bt proteins in the root. Research data also suggests that over the course of repeated exposure to Bt corn (continued product use for several years), increased rootworm survivorship can occur resulting in root injury at smaller rootworm populations, even in the absence of complete resistance. For this reason, it is imperative to use a multi-faceted rootworm management plan that interrupts continuous exposure of the rootworm population against the same tactic year over year, and ultimately slows down the rate at which resistance can evolve. The use of scouting, best management practices, and reporting any unexpected injury to your sales professional for follow-up are the keys to understanding if resistance is evolving in your fields.

Develop a Rootworm Management Program for your Operation
DuPont Pioneer and university research suggests that continuous, uninterrupted use of the same corn rootworm Bt technology can lead to decreased corn rootworm susceptibility to that technology, and may result in reduced product efficacy against these insects. To help maintain the efficacy of Bt corn rootworm products, it is essential to develop a multi-faceted rootworm control management plan. Your sales professional or your local Extension professionals can assist you in developing best management practices for your farming operation. Please contact your sales professional or consult with your local University Extension for more information regarding insect resistance management guidelines, best management practices and to understand whether there has been insect resistance documented in your area. Please refer to the next page for corn rootworm best management practices.

The use of soil-applied insecticides (SAIs) with corn rootworm protected Bt corn is not recommended for control of corn rootworm except under limited circumstances and consultation with extension, crop consultant or other local experts. SAIs should not be necessary for corn rootworm control with pyramided corn rootworm trait Bt corn product(s).

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2 Meinke, L. J., B. D. Siegfried, J. L. Wright, and L. D. Chandler. 1998. Adult susceptibility of Nebraska western corn rootworm (Coleoptera: Chrysomelidae) populations to selected insecticides. J. Econ. Entomol. 91:594-600.
To effectively manage corn rootworm (CRW), implement a multi-year plan that includes a variety of tactics.

**CROP ROTATION**

**PRODUCTS WITH MULTIPLE CRW B.T. TRAITS**

**SEED, SOIL OR FOLIAR-APPLIED INSECTICIDES**

**ASSESS RISK**

- Did you plant the same CRW traits for consecutive years in the same fields?
- Did you notice large populations of CRW beetles?
- Did you observe root injury from CRW larvae?
- Are your fields planted to continuous corn?
CORN ROOTWORM BEST MANAGEMENT PRACTICES

1. Plant the Required Refuge

Rotate at least every 3rd year if any of the following:
- In 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 soybean, CRW management options may be needed the following year.

2. Rotate Crops

Rotate at least every 3rd year if any of the following:
- In long-term continuous corn system
- CRW populations are high
- Experiencing problems with CRW trait performance

3. Rotate Traits

- Use B.t. hybrids with multiple modes of action for CRW control whenever possible
- If using a hybrid with multiple modes of action for CRW control is not an option, rotate to a different B.t.-traited hybrid that controls CRW
- Use a non-B.t.-traited hybrid with insecticide

4. Manage CRW with Insecticides

ADULT CRW MANAGEMENT CONSIDERATIONS
- Scout fields for CRW adults during silking 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 (= 1 beetle per plant)¹
- 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 B.t.-traited corn hybrid(s) except under limited circumstances.
- Consult with extension, crop consultants or other local experts for recommendations when considering a combination of CRW traits and soil applied insecticides.
- SAIs should not be necessary for CRW control with pyramided CRW traited B.t. corn hybrid(s).

All corn rootworm photos by Marlin E. Rice
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When a single control method is used continuously, there is a higher probability that pests will evolve to survive the control method, i.e. become resistant. Integrated Pest Management (IPM) is a science-based strategy and decision making process for controlling pests by using a combination of multiple pest control methods.

Pest Control
Use agronomic management best practices with appropriate seed products to obtain the highest yield benefits. Use seed products, planting technology, and seedling rates that are appropriate for a given crop in a particular geographic area. To the extent possible, avoid crop stress through crop management.
- Use scouting techniques and treatment decisions to ensure maintenance of beneficial insects that provide control of harmful insect pests.
- Use appropriate maturity products and associated harvest schedules, and destroy any crop residue promptly after harvest to minimize evolutionary selection for resistance in late-season infestations.

- Minimize over-wintering pests through use of soil management practices that encourage destruction of those pests.
- Use crop rotation and multiple modes of action in pest control activities to delay the onset of resistance in pest populations. If crop rotation is not possible or practical, or if rotation is used but high pest populations are still observed, use of multiple modes of action (such as Optimum® AcreMax® XTreme insect protection) is highly recommended to reduce the likelihood of resistance development.

Monitoring Pests
It is important to carefully monitor fields for all pests to determine whether treatment with a pest control method is needed. Scouting techniques and remedial pest control treatments should address the fact that larvae must hatch and feed before incorporated plant protection technologies have an effect on the pests. Scouting should be performed regularly, particularly after periods of heavy or sustained egg laying (especially during bloom), to determine whether larval survival is significant in a particular field.
Stewardship Through Insect Resistance Management

Insect Resistance Management (IRM) for Bt Corn

Following an insect resistance management (IRM) program is an essential part of good stewardship. The aim of an IRM program is to reduce the probability of target insects developing increased tolerance to the insecticidal Bt proteins, thus maximizing the longevity and effectiveness of these valuable traits in an environmentally-conscious way. Sustainable preservation of this technology places individual responsibility on everyone in the seed distribution system, from the seed supplier to the grower planting the seed. Additionally, IRM is a legal obligation as requirements have been incorporated into the registrations granted by the EPA for all Bt corn products.

A decrease in susceptibility or field-evolved resistance of some insect populations to certain technology traits in corn has been observed in different geographies which may result in lower than expected efficacy. To help extend durability of this technology, we recommend you implement Integrated Pest Management (IPM) practices such as crop rotation, cultural and biological control tactics (including rotating sources of Bt-protected corn traits), pest scouting, and appropriate use of pest thresholds when employing management practices such as insecticide application. You must also plant the required refuge when using this technology. Please contact your sales professional or consult with your local University Extension for more information regarding insect resistance management guidelines, best management practices and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

This Product Use Guide (PUG) contains important information on how to implement a proper IRM plan. If you have questions after reviewing this document, or if you wish to register a tip or complaint about a grower who may not be following the IRM refuge requirements, please contact your sales professional or call toll free at 1-800-323-6103.

IRM Requirements

IRM programs address: (1) the amount of refuge, (2) the required proximity of hybrids with the Bt traits to the refuge, (3) the use of insecticides in the refuge, and (4) the design and management of the refuge.

What is a Refuge?

A refuge is a block or strip of corn that does not contain a Bt trait for controlling corn pests. The purpose of this refuge is to maintain a population of corn pests that is susceptible to Bt proteins. Potentially-resistant insects emerging from Bt fields can mate with susceptible insects from the refuge resulting in Bt-susceptible offspring.

There are two types of refuge for products with the Bt trait: integrated and structured. Some Bt products have an integrated refuge with refuge seed blended in the bag, while other Bt products require a structured refuge. A structured refuge requires a grower to plant a portion of a field with another product that does not contain the insect-control traits of the Bt product. Grower-blended seed mixtures are not approved for use with any Bt hybrids to satisfy grower refuge requirements. Refuge requirements vary by product type and EPA-designated non-cotton and southern corn/cotton growing regions, as detailed on the following page. The southern corn/cotton growing regions are listed on the following page.

IRM Compliance Assurance Program (CAP)

We require all growers purchasing hybrids with a Bt trait sign a Technology Use Agreement. By signing, the grower agrees to implement an IRM program—including planting a corn refuge and following EPA-mandated use requirements—as outlined in the PUG. Failure to follow these IRM requirements can result in the grower losing access to structured refuge products.

The EPA requires Bt corn seed providers to conduct on-farm visits as part of a comprehensive Compliance Assurance Program (CAP) to assess whether growers are following the IRM requirements. These on-farm assessments are conducted by an independent third party and directed toward areas at high risk of insect resistance based on pest pressure, Bt corn market penetration, or insufficient refuge seed purchase.

The CAP also outlines consistent standards developed by the EPA and Bt corn registrants for responding to growers who have not followed the IRM requirements to bring them into full compliance. These responses include:

- Notifying the grower by letter of IRM compliance deviations.
- Conducting a compliance assistance visit with the grower prior to planting to assist the grower in planning and implementing a proper IRM program.
- Conducting a compliance assessment visit with the grower the following growing season to assess IRM compliance.
- Providing the grower additional IRM educational materials.
- A grower found with a second incident of non compliance with refuge requirements within a five-year period will be denied access the next year to the registrant’s structured refuge Bt corn products.
Structured Refuge Requirements

In non-cotton growing areas, the structured refuge requirements are 5% or 20% of corn acres planted for corn borer-protected products and 20% for corn rootworm-protected products. In cotton growing areas, the structured refuge requirements are 20% or 50% of corn acres planted for corn borer-protected products and 20% for corn rootworm-protected products.

Structured Refuge Planting Options for Above-Ground, Below-Ground, and Above+Below-Ground Products

A single-trait refuge is one that can be used for corn rootworms or corn borers, but not both. A common refuge is a single field that serves as a refuge for both corn borers and corn rootworms simultaneously. A separate refuge is a refuge designed exclusively for corn borers or exclusively for corn rootworms—i.e., a stacked Bt product can require two separate refuges.

Select Similar Hybrid for Structured Refuge

One key to establishing an effective refuge is selecting an appropriate hybrid—one that is agronomically similar to the Bt hybrid. This helps ensure that the refuge hybrid has the same likelihood of attracting adult insects as the Bt field. The refuge hybrid should match the Bt hybrid in maturity, early vigor and plant height.

Refuge Management

Management practices in the refuge acres and Bt corn acres must be as similar as possible to promote parallel hybrid development.

- To be effective, the refuge must be the correct size and distance from the Bt field, and be planted with a similar hybrid under similar management practices.
- Plant the refuge at the same time as the Bt hybrid.
- Fertility programs, including starter and sidedress, should be similar.
- Use the same tillage system in the Bt field and the refuge. Different tillage operations may result in dissimilar residue levels on the soil surface. Soil temperature differences could then lead to dramatic early development differences between the Bt field and the refuge.
- Reducing inputs on the refuge or planting it on marginal land also decreases the effectiveness of the refuge.
- If the refuge is planted on rotated ground, the trait corn must also be planted on rotated ground. If the refuge is planted on continuous corn ground, the trait corn may be planted on either continuous corn ground or rotated ground. It is also recommended that growers planting continuous corn plant the refuge in the same location each year.
- Practice Integrated Pest Management (IPM) to preserve the natural enemies of corn borer, corn rootworm and other insect pests. Natural predators such as ground beetles and ants can help reduce corn rootworm larvae populations. Bt corn insect protection aids IPM because it affects only target insects and allows beneficial insects to thrive.
- Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.
**Field Monitoring**

Monitoring Bt fields for insect resistance development is an integral part of an IRM plan. If resistant populations are detected early, alternative control measures can be quickly implemented to reduce the population and halt the spread of resistance. Because of its importance in maintaining the effectiveness of Bt technology, the EPA mandates activity monitoring as a condition of registration of Bt products. We require customers to monitor Bt fields for unexpected levels of insect damage and report any high level of suspected insect damage to a sales professional for further investigation. Acres planted with Bt hybrids should be correctly marked at planting to prevent confusion when monitoring.

**Structured Refuge Configuration**

Because Bt corn growers use different management practices, considerable flexibility is allowed in laying out the refuge. Several of these refuge patterns are described below.

Surveys indicate that most farmers plant the refuge within the Bt field. This closer proximity increases refuge effectiveness and maximizes Bt acreage in the field.

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### Single-Trait (Corn Borer or Corn Rootworm) and Common Refuge Configurations

- **Within**
  - Block
  - Perimeter
  - Strips

- **Adjacent**
  - Adjacent
  - Within adjacent field

Adjacent options separated by a road, path, ditch, etc., but not another field.

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### Separate Refuge Configurations

- **Block**
- **Perimeter or Border**
- **Striped Planter**

---

### Refuge Within the Bt Field:

- Block
- Perimeter or Border
- Striped Planter

### Separate-Field Refuge Distance Requirements:

- Appropriate refuges must be planted on every farm with a field that contains Bt corn—i.e., you cannot use a neighbor’s field to satisfy the refuge requirements.
- For corn borer-Bt products, refuge must be planted within 1/2 mile of each Bt corn field.
- For corn rootworm-Bt products, refuge must be planted adjacent to Bt hybrids; it can be separated by a ditch or a road but not by another field.

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Corn rootworm refuge must be within or adjacent to the Bt field – separated by a road, path, ditch, etc., but not another field. Corn borer refuge must be within or adjacent to the Bt field or within ½ mile of the Bt field.
Calculating Structured Refuge

Refer to this diagram for the examples below.

A. Total Corn Acres
B. Refuge Acres
C. Bt Acres

% Percent of Required Refuge— 5%, 20%, or 50%
Based on total corn acres

1 Includes all corn acres that are infield or adjacent to each other and will be allocated to the Bt product and its associated refuge.

THE CORRECT WAY TO CALCULATE
Example shown 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 Bt trait.

This is your minimum REFUGE ACRES.

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

This is your maximum Bt ACRES.

Download your free Insect Resistance Management (IRM) corn refuge calculator at www.irmcalculator.com.
Integrated refuge products will be treated for the major component and for the minor component. Bt genes for corn borer and/or corn rootworm protection help corn growers produce higher yields with better quality grain in an environmentally-conscious way. We offer many structured and integrated refuge products. This page contains integrated refuge products marketed under the following definitions:

**Definitions:**
- AM – Optimum® AcreMax® product
- AMT – Optimum® AcreMax® TRIsect® product
- AMX – Optimum® AcreMax® Xtra product
- AMXT – Optimum® AcreMax® XTreme product
- AML – Optimum® AcreMax® Lepra product
- HX1 – Herculex® I insect trait
- HXRW – Herculex® RW insect trait
- HXX – Herculex® XTRA insect trait
- LL – LibertyLink® (glufosinate) herbicide resistance
- RR2 – Roundup Ready® Corn 2 (glyphosate) herbicide resistance
- RW – Agrisure® RW trait
- YGCB – YieldGard® Corn Borer insect trait

### REFUGE REQUIREMENT: 20% CORN BORER REFUGE IN COTTON REGION

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>INSECT PROTECTION</th>
<th>INTEGRATED COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AcreMax</strong></td>
<td><strong>INTEGRATED</strong></td>
<td><strong>INTEGRATED</strong></td>
</tr>
<tr>
<td><strong>AM</strong></td>
<td>95% (YGCB,HX1,LL,RR2)</td>
<td>5% (LL,RR2)</td>
</tr>
<tr>
<td><strong>AMT</strong></td>
<td>95% (AM, YGCB, HX1, LL, RR2)</td>
<td>5% (LL, RR2)</td>
</tr>
<tr>
<td><strong>AMX</strong></td>
<td>95% (AM, YGCB, HX1, LL, RR2)</td>
<td>5% (LL, RR2)</td>
</tr>
<tr>
<td><strong>AMXT</strong></td>
<td>95% (AM, YGCB, HX1, LL, RR2)</td>
<td>5% (LL, RR2)</td>
</tr>
<tr>
<td><strong>AML</strong></td>
<td>95% (AM, YGCB, HX1, LL, RR2)</td>
<td>5% (LL, RR2)</td>
</tr>
</tbody>
</table>

### REFUGE REQUIREMENT: NO ADDITIONAL ROOTWORM REFUGE REQUIRED

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>INSECT PROTECTION</th>
<th>INTEGRATED COMPONENTS</th>
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</thead>
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<td><strong>AcreMax</strong></td>
<td><strong>INTEGRATED</strong></td>
<td><strong>INTEGRATED</strong></td>
</tr>
<tr>
<td><strong>LL</strong></td>
<td>90% (HXRW, LL, RR2)</td>
<td>10% (LL, RR2)</td>
</tr>
</tbody>
</table>

Not all products are available in all areas.
Bt genes for corn borer and/or corn rootworm protection help corn growers produce higher yields with better quality grain in an environmentally-conscious way. We offer many structured and integrated refuge options. This page contains the structured refuge products marketed under the following definitions:

**Definitions:**

- **AM1** – Optimum® AcreMax® 1 product
- **CHR** – Optimum® TRIsect® product
- **CYHR** – Optimum® Intrasect® TRIsect® product
- **CYXR** – Optimum® Intrasect® XTreme product
- **HX1** – Herculex® 1 insect trait
- **HXX** – Herculex® XTRA insect trait
- **LL** – LibertyLink® (glufosinate) herbicide resistance
- **RR2** – Roundup Ready® Corn 2 (glyphosate) herbicide resistance
- **RW** – Agrisure® RW trait
- **YGCB** – YieldGard® Corn Borer insect trait
- **YHR** – Optimum® Intrasect® product
- **VYHR** – Optimum® Leptra® product

### Structured Refuge Solutions

| REFUGE REQUIREMENT: 20% CORN BORER REFUGE IN CORN BELT, 50% IN COTTON REGION |
|---|---|---|
| **PRODUCT NAME** | **INSECT PROTECTION** | **COMPONENTS** |
| AcreMax 1 | STRUCTURED | 90% (HXX, LL, RR2) 10% (HX1, LL, RR2) |
| Intrasect | STRUCTURED | 100% (HXX, LL, RR2) |
| Intrasect | STRUCTURED | 100% (RW, HX1, LL, RR2) |
| Intrasect | STRUCTURED | 100% (YGCB, HXX, LL, RR2) |

| REFUGE REQUIREMENT: 5% REFUGE REQUIRED IN CORN BELT, 20% IN COTTON REGION |
|---|---|---|
| **PRODUCT NAME** | **INSECT PROTECTION** | **COMPONENTS** |
| Intrasect | STRUCTURED | 100% (YGCB, HXX, LL, RR2) |
| Intrasect | STRUCTURED | 100% (RW, YGCB, HXX, LL, RR2) |
| Intrasect | STRUCTURED | 100% (RW, YGCB, HXX, LL, RR2) |

| REFUGE REQUIREMENT: 20% REFUGE REQUIRED IN CORN BELT AND COTTON REGION |
|---|---|---|
| **PRODUCT NAME** | **INSECT PROTECTION** | **COMPONENTS** |
| Intrasect | STRUCTURED | 100% (YGCB, HXX, LL, RR2) |
| Intrasect | STRUCTURED | 100% (RW, YGCB, HXX, LL, RR2) |

Not all products are available in all areas.
Efficacy levels based on DuPont Pioneer and/or independent university entomologist results against susceptible insect populations. Product responses can vary by location, pest population, environmental conditions, and agricultural practices.

# Various factors, including pest pressure, reduced susceptibility, and insect resistance in some pest populations may affect efficacy of certain corn technology products in some regions. To help extend durability of these technologies, we recommend you implement Integrated Pest Management (IPM) practices such as crop rotation, cultural and biological control tactics (including rotating sources of Bt-protected corn traits), pest scouting, and appropriate use of pest thresholds when employing management practices such as insecticide application. You must also plant the required refuge when using these technologies. Please contact your sales professional or consult with your local university extension for more information regarding insect resistance management guidelines, best management practices and to understand whether there has been a shift in susceptibility or insect resistance with certain pests documented in your area.

* Western bean cutworm has been removed from the product use statement for several corn products that contain Herculex® I (Cry1F) but lack another mode of action for western bean cutworm due to a widespread decrease in susceptibility indicating the possibility of field-evolved resistance to Cry1F in most geographies.

<table>
<thead>
<tr>
<th>Technology Segment Identifiers</th>
<th>Corn Technology Traits</th>
<th>European Corn Borer</th>
<th>Corn Earworm#</th>
<th>Western Bean Cutworm*</th>
<th>Fall Armyworm#</th>
<th>Black Cutworm</th>
<th>Southern Corn Borer</th>
<th>Stalk Borer (Common)</th>
<th>Western Corn Rootworm#</th>
<th>Northern Corn Rootworm</th>
<th>Mexican Corn Rootworm</th>
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<tr>
<td>RR2</td>
<td>Roundup Ready® Corn 2</td>
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<tr>
<td>LL</td>
<td>LibertyLink®</td>
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<td>Q, LL, RR2</td>
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<td>CHR, LL, RR2</td>
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<td>AML, LL, RR2</td>
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<td>C</td>
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<td>S</td>
<td>C</td>
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<tr>
<td>AMVR, LL, RR2</td>
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<td>HHX1, LL, RR2</td>
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<td>Herculex® XTRA, LibertyLink, Roundup Ready Corn 2 (Corn Borer/Rootworm)</td>
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<td>C</td>
</tr>
</tbody>
</table>

C = Controlled  S = Suppressed  Blank = Not Labeled
All scores of integrated refuge products are based upon the major component.
Insect Resistance Management Grower Guide

Optimum® AcreMax® Insect Protection

(AM/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® ACREMAX® INSECT PROTECTION TECHNOLOGY? Products containing Optimum® AcreMax® Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: No additional refuge acres are required because the refuge for Optimum AcreMax Insect Protection is in the bag.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum AcreMax Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. In cotton-growing areas, the following refuge requirements must be followed:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum AcreMax Insect Protection corn field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

NON-COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Foliar insecticide treatments are also permitted for control of corn rootworm adults if economic thresholds are reached.

SOUTHERN CORN/COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. In addition, the refuge can be protected from CRW damage by an appropriate seed treatment or soil insecticide; however, insecticides labeled for adult CRW control must be avoided in the refuge during the period of CRW adult emergence.

Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Microbial Bt insecticides must not be applied on the refuge.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum AcreMax Insect Protection hybrids is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum AcreMax Insect Protection products are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed is a blend of 5% refuge seed and 95% seed containing the Herculex® I Insect Protection gene that produces a Bacillus thuringiensis (Bt) Cry1F protein and the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29984-12.

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

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

The purchase of these seeds with the YieldGard® Corn Borer gene includes a limited license to produce a single corn crop in the United States. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication is strictly prohibited.

The purchase of these seeds with the YieldGard® Corn Borer gene includes a limited license to produce a single corn crop in the United States. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication is strictly prohibited.

The purchase of these seeds with the YieldGard® Corn Borer gene includes a limited license to produce a single corn crop in the United States. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication is strictly prohibited.

The purchase of these seeds with the YieldGard® Corn Borer gene includes a limited license to produce a single corn crop in the United States. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication is strictly prohibited.
Insect Resistance Management Grower Guide

Optimum® AcreMax® Leترا® Insect Protection

(AML/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® ACREMAX® LEترا® INSECT PROTECTION? Hybrids containing Optimum® AcreMax® Leترا® Insect Protection provide protection or suppression against susceptible corn earworm, European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, and sugarcane borer. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: No additional refuge acres are required because the refuge for Optimum AcreMax Letra Insect Protection is in the bag.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum AcreMax Letra Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. In cotton-growing areas, the following refuge requirements must be followed:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum AcreMax Letra Insect Protection products.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

- Insecticides for the control of European corn borer, southwestern corn borer, corn earworm, black cutworm, fall armyworm, and western bean cutworm may be applied to the refuge only if economic thresholds are reached for one or more of these insects.
- Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).
- Microbial Bt insecticides must not be applied on the refuge.
- If the refuge is treated, the Bt corn must also be treated.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum AcreMax Letra Insect Protection products is prohibited in certain California counties. Contact your sales professional for additional details

MAINE RESTRICTION: The sales, distribution, and planting of Optimum AcreMax Letra Insect Protection products are prohibited in Maine.

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

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof forropagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. Agrisure technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof forpropagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

PRODUCT USE STATEMENT: This seed is a blend of 5% refuge seed and 95% seed containing the Herculex® I Insect Protection gene that produces a Bacillus thuringiensis (Bt) Cry1F protein, the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein, and the Agrisure Viptera® gene that produces a Vip3Aa20 protein that provide protection or suppression against susceptible corn earworm, European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, and sugarcane borer. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-26.
Insect Resistance Management (IRM) Requirements

WHAT IS OPTIMUM® ACREMAX® TRISECT® INSECT PROTECTION TECHNOLOGY? Products containing Optimum® AcreMax® TRIsect® Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: No additional refuge acres are required because the refuge for Optimum AcreMax TRIsect Insect Protection is in the bag.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum AcreMax TRIsect Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. In cotton-growing areas, the following refuge requirements must be followed:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum AcreMax TRIsect Insect Protection corn field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

NON-COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Foliar insecticide treatments are also permitted for control of corn rootworm adults if economic thresholds are reached. SOUTHERN CORN/COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. In addition, the refuge can be protected from CRW damage by an appropriate seed treatment or soil insecticide; however, insecticides labeled for adult CRW control must be avoided in the refuge during the period of CRW adult emergence.

Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Microbial Bt insecticides must not be applied on the refuge.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum AcreMax TRIsect Insect Protection hybrids is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum AcreMax TRIsect Insect Protection hybrids are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed is a blend of 10% refuge seed and 90% seed containing the Herculex® I Insect Protection gene that produces a Bacillus thuringiensis (Bt) Cry1F protein and also contains the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein; and the Agrisure® RW gene that produces a Bt mCry3A protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-23.

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

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patent numbers. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing, is strictly prohibited. Resale or transfer of the seed is strictly prohibited.
Optimum® AcreMax® Xtra Insect Protection

(AMX/LL/RR2)
Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® ACREMAX® XTRA INSECT PROTECTION TECHNOLOGY? Products containing Optimum® AcreMax® Xtra Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum AcreMax Xtra Insect Protection products is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum AcreMax Xtra Insect Protection products are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed is a blend of 10% refuge seed and 90% seed containing the Herculex® XTRA Insect Protection genes that produce a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry34Ab1 and Cry35Ab1 proteins and also contains the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-11. You must sign a technology agreement, read the product use guide prior to planting and follow insect resistance management (IRM) requirements.

PATENT STATEMENT: The Herculex I and Herculex RW Insect Resistance technologies incorporated into these seeds are protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: No additional refuge acres are required because the refuge for Optimum AcreMax Xtra Insect Protection is in the bag.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum AcreMax Xtra Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. In cotton-growing areas, the following refuge requirements must be followed:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum AcreMax Xtra Insect Protection corn field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

NON-COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Foliar insecticide treatments are also permitted for control of corn rootworm adults if economic thresholds are reached.

SOUTHERN CORN/COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. In addition, the refuge can be protected from CRW damage by an appropriate seed treatment or soil insecticide; however, insecticides labeled for adult CRW control must be avoided in the refuge during the period of CRW adult emergence.

Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).

Microbial Bt insecticides must not be applied on the refuge.

Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for additional details.

Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).

Microbial Bt insecticides must not be applied on the refuge.

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IMPORTANT: READ PRIOR TO PLANTING

Insect Resistance Management (IRM) Requirements

Microbial Bt insecticides must not be applied on the refuge.

agents, crop consultants).

for one or more of these pests. Economic thresholds will be determined using black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: No additional refuge acres are required because the refuge for Optimum AcreMax XTreme Insect Protection products is in the bag.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum AcreMax XTreme Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. In cotton-growing areas, the following refuge requirements must be followed:

- The refuge may be planted in-field, adjacent to [e.g., across the road], or as a separate block within 1/2 mile of the Optimum AcreMax XTreme Insect Protection corn field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

NON-COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Foliar insecticide treatments are also permitted for control of corn rootworm adults if economic thresholds are reached. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Microbial Bt insecticides must not be applied to non-Bt corn refuge plants.

SOUTHERN CORN/COTTON-GROWING AREAS: Insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).

Microbial Bt insecticides must not be applied on the refuge.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum AcreMax XTreme Insect Protection products is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum AcreMax XTreme Insect Protection products are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed is a blend of 5% refuge seed and 95% seed containing the Herculex® XTRA Insect Protection genes that produce a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry3AAb1 and Cry35Ab1 proteins; the Agrisure® RW trait that includes a gene that produces a Bt mCry3A protein, and the YIELDGARD® Corn Borer gene which produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-16.

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

PATENT STATEMENT: The Herculex I and Herculex RW Insect Resistance technologies incorporated into these seeds are protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one more U.S. patent numbers. This license does not extend to the uses of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing, is strictly prohibited. Resale or transfer of the seed is strictly prohibited.
Insect Resistance Management Grower Guide

Optimum® AcreMax® 1 Insect Protection

(AM1/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® ACREMAX® 1 INSECT PROTECTION TECHNOLOGY? Products that contain the Optimum® AcreMax® 1 Insect Protection technology provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres to Optimum AcreMax 1 Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 50% of the corn acres with Optimum AcreMax 1 Insect Protection products. Plant at least 50% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum AcreMax 1 Insect Protection corn field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.

- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

- Insecticides for the control of European corn borer, southwestern corn borer, corn earworm, black cutworm, fall armyworm, and western bean cutworm may be applied to the refuge only if economic thresholds are reached for one or more of these insects.

- Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).

- Microbial Bt insecticides must not be applied on the refuge.

- If the refuge is treated, the Bt corn must also be treated.

- The Optimum AcreMax 1 Insect Protection and refuge seed can both be treated with a soil applied, foliar applied or seed applied insecticides for corn rootworm control.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of products with Optimum AcreMax 1 Insect Protection is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of products with Optimum AcreMax 1 Insect Protection are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed is a blend of 10% refuge seed and 90% seed containing the Herculex® XTRA Insect Protection gene that produces a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry34Ab1 and Cry35Ab1 proteins and 10% seed containing the Herculex® I Insect Protection gene that produces a Bt Cry1F protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-6.

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

PATENT STATEMENT: The Herculex I and the Herculex RW Insect Resistance technologies incorporated into these seeds are protected by one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.
Qrome® Insect Protection

(O/LL/RR2) Insect Resistance Management (IRM) Requirements

WHAT IS QROME® INSECT PROTECTION TECHNOLOGY? Qrome® Insect Protection products provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

*OREME STEWARDSHIP GUIDANCE
Qrome products are approved for cultivation in the U.S. and Canada and have also received approval in a number of countries. DuPont Pioneer continues to pursue additional import approvals for Qrome, including in China, in accordance with Excellence Through Stewardship product launch guidance. Grain and certain by-products produced from Qrome cannot be marketed in unapproved locations, including China, until the applicable approval is granted. Growers can refer to http://www.biotradestatus.com/ for updated information on import country approvals.

Until further notice, Qrome products can only be sold to and planted by growers who agree to use the grain as feed for livestock on their own farming operation or agree to only sell their grain directly to producers who agree to feed this grain to their livestock. No export of grain produced from Qrome products is currently permitted as part of stewardship requirements.

REFUGE PERCENTAGE
NON-COTTON GROWING AREAS: No additional refuge acres are required because the refuge for Qrome Insect Protection products is in the bag.
SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Qrome Insect Protection products. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. In cotton-growing areas, the following refuge requirements must be followed:
- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Qrome Insect Protection corn field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE
NON-COTTON GROWING AREAS: Foliar insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, northern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Foliar insecticide treatments are also permitted for control of corn rootworm adults if economic thresholds are reached. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Microbial Bt insecticides must not be applied to non-Bt corn refuge plants.
SOUTHERN CORN/COTTON-GROWING AREAS: Insecticide treatments for control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).
Microbial Bt insecticides must not be applied on the refuge.

QROME PRODUCT STEWARDSHIP AGREEMENT (QPSA): All plantings of Qrome products shall include execution by the grower of a QPSA noting that Qrome products can only be sold to and planted by growers who agree to use the grain as feed for livestock on their own farming operation or agree to only sell their grain directly to producers who agree to feed this grain to their livestock.

SALES AND PLANTING RESTRICTIONS
CALIFORNIA RESTRICTION: The planting of Qrome Insect Protection products is prohibited in certain California counties. Contact your sales professional for additional details.
MAINE RESTRICTION: The sales, distribution, and planting of Qrome products are prohibited in Maine.
PUERTO RICO RESTRICTION: The sales, distribution, and planting of Qrome Insect Protection products are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed is a blend of 5% refuge seed and 95% seed containing the Herculex® XTRA Insect Protection genes that produce a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry34Ab1 and Cry35Ab1 proteins; the Agrisure® RW trait that includes a gene that produces a Bt mCry3A protein, and the YIELDGARD® Corn Borer gene which produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-21

YOU MUST SIGN A TECHNOLOGY AGREEMENT AND QROME PRODUCT STEWARDSHIP AGREEMENT, READ THE PRODUCT USE GUIDE PRIOR TO PLANTING AND FOLLOW INSECT RESISTANCE MANAGEMENT (IRM) REQUIREMENTS.

PATENT STATEMENT: The Herculex I and Herculex RW Insect Resistance technologies incorporated into these seeds are protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation, seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing, is strictly prohibited. Resale or transfer of the seed is strictly prohibited.

© YIELDGARD is a registered trademark used under license from Monsanto Co. Herculex® I Insect Protection technology by Dow AgroSciences and Pioneer Hi-Bred. © Herculex is a registered trademark of Dow AgroSciences LLC. Agrisure® is a registered trademark of, and used under license from, A Syngenta Group company. Agrisure® technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG
Insect Resistance Management Grower Guide
Herculex® I (HX1) Insect Protection

HX1/LL/RR2
Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS HERCULEX® I INSECT PROTECTION TECHNOLOGY? Hybrids that contain the Herculex I (HX1) trait provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE
NON-COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with hybrids with the HX1 trait. Plant at least 20% of the corn acres to a corn borer refuge.
SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 50% of the corn acres with hybrids with the HX1 trait. Plant at least 50% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:
- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the HX1 trait.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE
- Insecticides for the control of European corn borer, southwestern corn borer, corn earworm, black cutworm, fall armyworm, and western bean cutworm may be applied to the refuge only if economic thresholds are reached for one or more of these insects.
- Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).
- For control of lepidopteran insects in the refuge, an insecticide such as DuPont™ Coragen® may be applied based on local recommended pest thresholds. For specific use instructions on Coragen® consult the product label or contact a DuPont Crop Protection representative.
- Microbial Bt insecticides must not be applied on the refuge.
- If the refuge is treated, the Bt corn must also be treated.

SALES AND PLANTING RESTRICTIONS
CALIFORNIA RESTRICTION: The planting of hybrids with the HX1 trait is prohibited in certain California counties. Contact your sales professional for additional details.
PUERTO RICO RESTRICTION: The sales, distribution, and planting of hybrids with the HX1 trait are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed contains the Herculex® I Insect Protection gene that produces a *Bacillus thuringiensis (Bt)* Cry1F protein that provides protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. This protein and the genetic material necessary for its production in corn are approved under EPA Reg. No. 029964-3.

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

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.
Insect Resistance Management Grower Guide

Herculex® XTRA (HXX) Insect Protection

(HXX/LL/RR2)
Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

REFUGE OPTIONS

- **Common Refuge for Herculex Xtra Insect Protection**
  A common refuge is designed to address both corn borers and corn rootworms. The HX1 and HXRW traits in HXX are managed as one component for refuge purposes. The common refuge must be planted with corn hybrids that do not contain Bt genes for the control of corn borers or corn rootworms. This option is the simplest and easiest to implement.

- **Separate Refuge for Herculex Xtra Insect Protection**
  A separate refuge is designed to work independently for each insect (i.e., corn borers and corn rootworms). The HX1 and HXRW components in HXX are managed separately for refuge purposes. This option offers more flexibility than the common refuge.

**WHAT IS HERCULEX® XTRA INSECT PROTECTION TECHNOLOGY?** Hybrids that contain Herculex® XTRA (HXX) have two insect protection traits: the Herculex I (HX1) trait and the Herculex RW (HXRW) trait. Hybrids that contain HXX traits provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

**REFUGE OPTIONS**

**COMMON REFUGE**

On each farm, plant up to 80% of your corn acres with hybrids that contain the HXX traits. Plant a minimum of 20% of your corn acres to a common refuge with hybrids that do not contain Bt genes for control of corn borer and corn rootworm.

**REFUGE PERCENTAGE – Non-Cotton Growing Areas**

- **For corn borers** — Plant a minimum of 20% of your corn acres to a corn borer refuge that does not contain a Bt trait for control of corn borer.
- **For corn rootworms** — Plant at least 20% of your corn acres to a corn rootworm refuge that does not contain a Bt trait for control of corn rootworm.

**REFUGE PERCENTAGE – Southern Corn/Cotton Growing Areas**

On each farm, plant up to 50% of your corn acres with hybrids that contain the HXX traits. Plant a minimum of 50% of your corn acres to a common refuge with hybrids that do not contain Bt traits for control of corn borer and corn rootworm.

- **For corn borers** — Plant a minimum of 50% of your corn acres to a corn borer refuge that does not contain a Bt trait for control of corn borer.
- **For corn rootworms** — Plant at least 20% of your corn acres to a corn rootworm refuge that does not contain a Bt trait for control of corn rootworm.

**DISTANCE REQUIREMENT**

Plant the refuge within or adjacent to fields containing hybrids with HXX traits. The common refuge can be separated by a ditch or a road but not by another field. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge.

- **For corn borers** — Plant the corn borer refuge within, adjacent to, or near the fields that contain hybrids with Bt corn borer protection such as the HXX traits. The corn borer refuge must be placed within 1/2 mile of these fields. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge.
- **For corn rootworms** — Plant the corn rootworm refuge within or adjacent to fields that contain hybrids with Bt corn rootworm protection such as the HXX traits. The corn rootworm refuge can be separated by a ditch or a road but not by another field. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge.
The common refuge can be treated for corn rootworm larvae and other soil pests with soil-applied, seed-applied or foliar-applied insecticides. The refuge can also be treated with a non-Bt foliar insecticide to control pests (such as corn borer) if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Pests other than adult corn rootworms can be treated on the combined refuge acres, without treating the HXX acres, only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. If aerial insecticides are applied to the combined refuge for control of corn rootworm adults, the same treatment must also be applied in the same timeframe to HXX acres. Pests on the HXX acres can be treated as needed without having to treat the common refuge.

The refuge on each farm may be arranged in a number of different configurations that allow growers to easily incorporate an effective common refuge into their farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field or adjacent to (e.g., across the road) the HXX trait field.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.

For corn borers — The corn borer refuge can be treated with a soil-applied, seed-applied, or foliar-applied insecticide for corn rootworm larval control. The corn borer refuge can be protected from corn rootworm damage by planting a hybrid with corn rootworm protection technology. The refuge can also be treated with a non-Bt foliar insecticide to control pests such as corn borer, if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Under this option, the HXX area of the field does not have to be treated in a similar manner.

For corn rootworms — The corn rootworm refuge can be treated with a soil-applied, seed-applied, or foliar-applied insecticide for corn rootworm larval control. The corn rootworm refuge can be protected from corn borer damage by planting a hybrid with corn borer protection technology. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Pests other than adult corn rootworms can be treated on the rootworm refuge acres, without treating the HXX acres, only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. If aerial insecticides are applied to the rootworm refuge for control of CRW adults, the same treatment must also be applied in the same timeframe to HXX acres. Pests on the HXX acres can be treated as needed without having to treat the rootworm refuge.

SALES AND PLANTING RESTRICTIONS
CALIFORNIA RESTRICTION: The planting of hybrids with the HXX traits is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of hybrids with the HXX trait are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed contains the Herculex® XTRA Insect Protection genes that produce a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry34Ab1 and Cry35Ab1 proteins that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are approved under EPA Reg. No. 29964-5.

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

PATENT STATEMENT: The Herculex I and Herculex RW Insect Resistance technologies incorporated into these seeds are protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.
Insect Resistance Management Grower Guide

Optimum® TRIsect® Insect Protection

(RW/HX1/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® TRISECT® INSECT PROTECTION TECHNOLOGY? Hybrids that contain Optimum® TRIsect® Insect Protection have two insect protection traits: the Herculex® I (HX1) trait and the Agrisure® RW trait. Hybrids that contain Optimum TRIsect Insect Protection traits provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE OPTIONS

■ Common Refuge for Optimum TRIsect Insect Protection

A common refuge is designed to address both corn borers and corn rootworms. The HX1 and Agrisure® RW traits in Optimum TRIsect Insect Protection are managed as one component for refuge purposes. The common refuge must be planted with corn hybrids that do not contain Bt genes for the control of corn borers or corn rootworms. This option is the simplest and easiest to implement.

■ Separate Refuge for Optimum TRIsect Insect Protection

A separate refuge is designed to work independently for each insect (i.e., corn borers and corn rootworms). The HX1 and Agrisure RW components in Optimum TRIsect Insect Protection are managed separately for refuge purposes. This option offers more flexibility than the common refuge.

On each farm, plant up to 80% of your corn acres with hybrids that contain the Optimum TRIsect Insect Protection traits. Plant a minimum of 20% of your corn acres to a common refuge with hybrids that do not contain Bt traits for control of corn borers and corn rootworm.

DISTANCE REQUIREMENT

For corn borers — Plant the corn borer refuge within, adjacent to or near the fields that contain hybrids with Bt corn borer protection such as the Optimum TRIsect Insect Protection traits. The corn borer refuge must be placed within 1/2 mile of these fields. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge.

For corn rootworms — Plant the corn rootworm refuge within or adjacent to fields containing hybrids with Bt corn rootworm protection such as the Optimum TRIsect Insect Protection traits. The corn refuge can be separated by a ditch or a road but not by another field. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge.
**COMMON REFUGE**

The common refuge can be treated for corn rootworm larvae and other soil pests with soil-applied, seed-applied or foliar-applied insecticides. The refuge can also be treated with a non-Bt foliar insecticide to control pests (such as corn borer) if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Pests other than adult corn rootworms can be treated on the combined refuge acres, without treating the Optimum® TRIsect® Insect Protection acres, only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. If aerial insecticides are applied to the combined refuge for control of corn rootworm adults, the same treatment must also be applied in the same timeframe to Optimum TRIsect Insect Protection acres. Pests on the Optimum TRIsect Insect Protection acres can be treated as needed without having to treat the common refuge.

**SEPARATE REFUGE**

**INSECTICIDE USE**

| **For corn borers** | The corn borer refuge can be treated with a soil-applied, seed-applied, or foliar-applied insecticide for corn rootworm larval control. The corn borer refuge can be protected from corn rootworm damage by planting a hybrid with corn rootworm protection technology. The refuge can also be treated with a non-Bt foliar insecticide to control pests such as corn borer, if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Under this option, the Optimum TRIsect Insect Protection area of the field does not have to be treated in a similar manner. |
| **For corn rootworms** | The corn rootworm refuge can be treated with a soil-applied, seed-applied, or foliar-applied insecticide for corn rootworm larval control. The corn rootworm refuge can be protected from corn borer damage by planting a hybrid with corn borer protection technology. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Pests other than adult corn rootworms can be treated on the refuge acres, without treating the Optimum TRIsect Insect Protection acres, only if treatment occurs when adult corn rootworms are not present or if a pesticide without activity against adult corn rootworms is used. If aerial insecticides are applied to the rootworm refuge for control of CRW adults, the same treatment must also be applied in the same timeframe to Optimum TRIsect Insect Protection acres. Pests on the Optimum TRIsect Insect Protection acres can be treated as needed without having to treat the rootworm refuge. |

**REFUGE DESIGN – Refuge Configuration Options**

| **For corn borers** | The corn borer refuge on each farm may be arranged in a number of configurations that allow growers to easily incorporate an effective corn refuge into their farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include: |
| **For corn rootworms** | The corn rootworm refuge on each farm may be arranged in a number of configurations that allow the grower to easily incorporate an effective corn refuge into farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include: |

| Options include: | The refuge may be planted in-field, adjacent to (e.g., across the road) the Optimum TRIsect Insect Protection hybrids. |
| Options include: | In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips. |
| Options include: | When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide. |

| Options include: | The refuge may be planted in-field, adjacent to (e.g., across the road) the Optimum TRIsect Insect Protection hybrids. |
| Options include: | In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips. |
| Options include: | When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide. |

**SALES AND PLANTING RESTRICTIONS**

**CALIFORNIA RESTRICTION**: The planting of hybrids with the Optimum TRIsect Insect Protection trait is prohibited in certain California counties. Contact your sales professional for additional details.

**PUERTO RICO RESTRICTION**: The sales, distribution, and planting of hybrids with the Optimum TRIsect Insect Protection trait are prohibited in Puerto Rico.

**PRODUCT USE STATEMENT**: This seed contains the Herculex® I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable production country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

**Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation, seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing is strictly prohibited.**

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

**PATENT STATEMENT**: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable production country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation, seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing is strictly prohibited. Resale or transfer of this seed is strictly prohibited.
Insect Resistance Management Grower Guide

Optimum® Intrasect® Insect Protection

(YGCB/HX1/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® INTRASECT® INSECT PROTECTION TECHNOLOGY? Hybrids containing Optimum® Intrasect® Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: On each farm, plant up to 95% of the corn acres with Optimum Intrasect Insect Protection hybrids. Plant at least 5% of the corn acres to a corn borer refuge.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum Intrasect Insect Protection hybrids. Plant at least 20% of the corn acres to a corn borer refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum Intrasect Insect Protection hybrids.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

- Insecticides for the control of European corn borer, southwestern corn borer, corn earworm, black cutworm, fall armyworm, and western bean cutworm may be applied to the refuge only if economic thresholds are reached for one or more of these insects.
- Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).
- For control of lepidopteran insects in the refuge, an insecticide such as DuPont™ Coragen® may be applied based on local recommended pest thresholds. For specific use instructions on Coragen® consult the product label or contact a DuPont Crop Protection representative.
- Microbial Bt insecticides must not be applied on the refuge.
- If the refuge is treated, the Bt corn must also be treated.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum Intrasect Insect Protection hybrids is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum Intrasect Insect Protection hybrids are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed contains the Herculex® I Insect Protection gene that produces a Bacillus thuringiensis (Bt) Cry1F protein and also contains the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer and corn earworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-7.

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

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.
Insect Resistance Management Grower Guide

Optimum® Leпtra ® Insect Protection

(AVBL/YGCB/HX1/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® LEPTRA® TECHNOLOGY? Hybrids containing Optimum® Leпtra® Insect Protection provide protection or suppression against susceptible corn earworm, European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, and sugarcane borer. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: On each farm, plant up to 95% of the corn acres with Optimum Leпtra Insect Protection hybrids. Plant at least 5% of the corn acres to a refuge.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum Leпtra Insect Protection hybrids. Plant at least 20% of the corn acres to a refuge.

REFUGE DESIGN: The corn borer refuge for each field may be arranged in a number of configurations that allow the grower to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum Leпtra Insect Protection hybrids.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.
- Please note: Use of a neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

- Insecticides for the control of European corn borer, southwestern corn borer, corn earworm, black cutworm, fall armyworm, and western bean cutworm may be applied to the refuge only if economic thresholds are reached for one or more of these insects.
- Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).
- Microbial Bt insecticides must not be applied on the refuge.
- If the refuge is treated, the Bt corn must also be treated.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum Leпtra Insect Protection hybrids is prohibited in certain California counties. Contact your sales professional for additional details.

MAINE RESTRICTION: The sales, distribution, and planting of Optimum Leпtra Insect Protection hybrids are prohibited in Maine.

PRODUCT USE STATEMENT: This seed contains the Herculex® I Insect Protection gene that produces a Bacillus thuringiensis (Bt) Cry1F protein, the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein, and the Agrisure Viпtera® gene that produces a Vip3Aa20 protein that provide protection or suppression against susceptible corn earworm, European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, and sugarcane borer. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-19.

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

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication.

Agrisure technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

Agrisure technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation, seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing, is strictly prohibited. Resale or transfer of this seed is strictly prohibited.

* YIELDGARD is a registered trademark used under license from Monsanto Co.
* Herculex® I Insect Protection technology by Dow AgroSciences and Pioneer Hi-Bred.
* Herculex and the HX logo are registered trademarks of Dow AgroSciences LLC.

YIELDGARD is a registered trademark used under license from Monsanto Co. Herculex® I Insect Protection technology by Dow AgroSciences and Pioneer Hi-Bred.

* Herculex and the HX logo are registered trademarks of Dow AgroSciences LLC. Agrisure Viпtera™ is a registered trademark of, and used under license from, a Syngenta Group Company. Agrisure® technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG.
Insect Resistance Management Grower Guide
Optimum® Intrasect® XTreme Insect Protection

(RW/YGCB/HXX/LL/RR2)
Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® INTRASECT® XTREME INSECT PROTECTION TECHNOLOGY? Hybrids containing Optimum® Intrasect® XTreme Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum Intrasect XTreme products is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum Intrasect XTreme products is prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed contains the Herculex® XTRA Insect Protection genes that produce a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry34Ab1 and Cry35Ab1 proteins; the Agrisure® RW trait that includes a gene that produces a Bt mCry3A protein, and the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, sugarcane borer, stalk borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 239564-14.

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

PATENT STATEMENT: The Herculex I and Herculex RW Insect Resistance technologies incorporated into these seeds are protected under one or more U.S. patent numbers. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one or more U.S. patent numbers. This license does not extend to the use of seed or the progeny thereof for propagation, seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing, is strictly prohibited. Resale or transfer of this seed is strictly prohibited.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: On each farm, plant up to 95% of the corn acres with Optimum Intrasect XTreme Insect Protection hybrids. Plant a minimum of 5% of the corn acres to a refuge.

SOUTHERN CORN/COTTON GROWING AREAS: On each farm, plant up to 80% of the corn acres with Optimum Intrasect XTreme Insect Protection hybrids. Plant a minimum of 20% of the corn acres to a refuge.

REFUGE DESIGN: The refuge on each farm may be arranged in a number of different configurations that allow growers to easily incorporate an effective refuge into a farming operation. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field or adjacent to (e.g., across the road) the Optimum Intrasect XTreme Insect Protection hybrids.
- In field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field, refuges must be four rows wide.

Please note: A neighbor’s field does not satisfy the refuge requirement.

INSECTICIDE USE

- Insecticides for the control of European corn borer, corn earworm, southwestern corn borer, fall armyworm, black cutworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, and sugarcane borer may be applied only if economic thresholds are reached for one or more of these insects.
- Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).
- The refuge can be treated with a soil-applied, foliar-applied or seed-applied insecticide for corn rootworm control. However, insecticides labeled for adult corn rootworm control must not be applied on the refuge when adult corn rootworms are present.
- Microbial Bt insecticides must not be applied on the refuge.
### Insect Resistance Management Grower Guide

**Optimum® Intrasect® Xtra Insect Protection**

**(YGCB/HXX/LL/RR2)**

**Insect Resistance Management (IRM) Requirements**

**IMPORTANT: READ PRIOR TO PLANTING**

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**WHAT IS OPTIMUM® INTRASECT® XTRA INSECT PROTECTION TECHNOLOGY?** Hybrids containing Optimum® Intrasect® Xtra Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

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### REFUGE OPTIONS

- **Common Refuge for Optimum Intrasect Xtra Insect Protection**
  A common refuge is designed to address both corn borers and corn rootworms. The Optimum Intrasect Xtra Insect Protection traits are managed as one component for refuge purposes. The common refuge must be planted with corn hybrids that do not contain Bt genes for the control of corn borers or corn rootworms. This option is the simplest and easiest to implement.

- **Separate Refuge for Optimum Intrasect Xtra Insect Protection**
  A separate refuge is designed to work independently for each insect (i.e., corn borers and corn rootworms). The Optimum Intrasect Xtra Insect Protection components are managed separately for refuge purposes. This option offers more flexibility than the common refuge.

---

### COMMON REFUGE

<table>
<thead>
<tr>
<th>REFUGE PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>On each farm, plant up to 80% of your corn acres with Optimum Intrasect Xtra Insect Protection hybrids. Plant a minimum of 20% of your corn acres to a common refuge with hybrids that do not contain Bt traits for control of corn borer and corn rootworm.</td>
</tr>
</tbody>
</table>

### SEPARATE REFUGE

<table>
<thead>
<tr>
<th>REFUGE PERCENTAGE</th>
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</thead>
<tbody>
<tr>
<td>For corn borers – Plant a minimum of 20% of your corn acres to a corn borer refuge that does not contain a Bt trait for control of corn borer.</td>
</tr>
<tr>
<td>For corn rootworms – Plant at least 20% of your corn acres to a corn rootworm refuge that does not contain a Bt trait for control of corn rootworm.</td>
</tr>
</tbody>
</table>

### DISTANCE REQUIREMENT

| For corn borers – Plant the corn borer refuge within, adjacent to, or near the fields that contain Optimum Intrasect Xtra Insect Protection hybrids with Bt corn borer protection. The corn borer refuge must be placed within 1/2 mile of these fields. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge. |
| For corn rootworms – Plant the corn rootworm refuge within or adjacent to fields that contain Optimum Intrasect Xtra Insect Protection hybrids with Bt corn rootworm protection. The corn refuge can be separated by a ditch or a road but not by another field. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge. |
The common refuge can be treated for corn rootworm larvae and other soil pests with soil-applied, seed-applied or foliar-applied insecticides. The refuge can also be treated with a non-Bt foliar insecticide to control pests (such as corn borer) if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Pests other than adult corn rootworms can be treated on the combined refuge acres, without treating the Optimum® Intrasect® Xtra Insect Protection acres, only if treatment occurs when adult corn rootworms are present or if a pesticide without activity against adult corn rootworms is used. If aerial insecticides are applied to the combined refuge for control of corn rootworm adults, the same treatment must also be applied in the same timeframe to Optimum Intrasect Xtra Insect Protection acres. Pests on the Optimum Intrasect Xtra Insect Protection acres can be treated as needed without having to treat the common refuge.

REFUGE DESIGN – Refuge Configuration Options

The refuge on each farm may be arranged in a number of different configurations that allow growers to easily incorporate an effective common refuge into their farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field or adjacent to (e.g., across the road) the Optimum Intrasect Xtra Insect Protection hybrids.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.

SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum Intrasect Xtra Insect Protection hybrids is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum Intrasect Xtra Insect Protection hybrids is prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed contains the Herculex® XTRA Insect Protection gene that produce a Bacillus thuringiensis (Bt) Cry1F protein and the Bt Cry34Ab1 and Cry35Ab1 proteins and also contains the YIELDGARD® Corn Borer gene that produces a Bt Cry1Ab protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-8.

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

PATENT STATEMENT: The Herculex I and Herculex RW Insect Resistance technologies incorporated into these seeds are protected under one or more U.S. patents. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.

This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited.
Insect Resistance Management Grower Guide

Optimum® Intrasect® TRIsect® Insect Protection

(RW/YGCB/HX1/LL/RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING

WHAT IS OPTIMUM® INTRASECT® TRISECT® INSECT PROTECTION TECHNOLOGY? Hybrids containing Optimum® Intrasect® TRIsect® Insect Protection provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Please contact your sales professional for more information regarding insect resistance management guidelines, best management practices and corn products for your area and to understand whether there has been a shift in susceptibility or insect resistance documented in your area.

REFUGE PERCENTAGE

- **Common Refuge for Optimum Intrasect TRIsect Insect Protection**
  A common refuge is designed to address both corn borers and corn rootworms. The Optimum Intrasect TRIsect Insect Protection traits are managed as one component for refuge purposes. The common refuge must be planted with corn hybrids that do not contain Bt genes for the control of corn borers or corn rootworms. This option is the simplest and easiest to implement.

- **Separate Refuge for Optimum Intrasect TRIsect Insect Protection**
  A separate refuge is designed to work independently for each insect (i.e., corn borers and corn rootworms). The Optimum Intrasect TRIsect Insect Protection components are managed separately for refuge purposes. This option offers more flexibility than the common refuge.

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<td></td>
<td><strong>For corn rootworms</strong> – Plant at least 20% of your corn acres to a corn rootworm refuge that does not contain a Bt trait for control of corn rootworm.</td>
</tr>
</tbody>
</table>

| **DISTANCE REQUIREMENT** | **For corn borers** – Plant the corn borer refuge within, adjacent to, or near the fields that contain Optimum Intrasect TRIsect Insect Protection hybrids with Bt corn borer protection. The corn borer refuge must be placed within 1/2 mile of these fields. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge. |
| | **For corn rootworms** – Plant the corn rootworm refuge within or adjacent to fields that contain Optimum Intrasect TRIsect Insect Protection hybrids with Bt corn rootworm protection. The corn root refuge can be separated by a ditch or a road but not by another field. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge. |

On each farm, plant up to 80% of your corn acres with Optimum Intrasect TRIsect Insect Protection hybrids. Plant a minimum of 20% of your corn acres to a common refuge with hybrids that do not contain Bt traits for control of corn borer and corn rootworm.

Plant the refuge within or adjacent to fields containing Optimum Intrasect TRIsect Insect Protection hybrids. The common refuge can be separated by a ditch or a road but not by another field. The refuge must be owned or managed by the same grower. A neighbor’s field cannot be used as the refuge.
SALES AND PLANTING RESTRICTIONS

CALIFORNIA RESTRICTION: The planting of Optimum Intrasect TRIsect Insect Protection hybrids is prohibited in certain California counties. Contact your sales professional for additional details.

PUERTO RICO RESTRICTION: The sales, distribution, and planting of Optimum Intrasect TRIsect Insect Protection hybrids are prohibited in Puerto Rico.

PRODUCT USE STATEMENT: This seed contains the Herculex® I Insect Protection gene that produces a *Bacillus thuringiensis* (Bt) Cry1F protein; the YIELDGARD® Corn Borer gene which produces a Bt Cry1Ab protein; and the Agrisure® RW gene which produces a Bt mCry3A protein that provide protection or suppression against susceptible European corn borer, southwestern corn borer, black cutworm, fall armyworm, lesser corn stalk borer, southern corn stalk borer, stalk borer, sugarcane borer, and corn earworm; and also provide protection from larval injury caused by susceptible western corn rootworm, northern corn rootworm and Mexican corn rootworm. Product responses may vary by location, pest population, environmental conditions, and agricultural practices. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-24.

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under one or more U.S. patent numbers. The purchase of these seeds includes a limited license to produce a single corn crop in the United States (or other applicable country). The use of seed from such a crop or the progeny thereof for propagation or seed multiplication or for production or development of a hybrid or different variety of seed is strictly prohibited. Agrisure RW technology incorporated into these seeds is commercialized under a license from Syngenta Crop Protection AG, under one or more U.S. patent numbers. This license does not extend to the use of seed from such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation seed multiplication, production or development of a hybrid or different variety of seed, research, breeding or crossing, is strictly prohibited. Resale or transfer of the seed is strictly prohibited.

INSECTICIDE USE

For corn borers – The corn borer refuge can be treated with a soil-applied, seed-applied, or foliar-applied insecticide for corn rootworm larval control. The corn borer refuge can be protected from corn rootworm damage by planting a hybrid with corn rootworm protection technology (such as Herculex® RW). The refuge can also be treated with a non-Bt foliar insecticide to control pests such as corn borer, if pest pressure reaches an economic threshold for damage. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Under this option, the Optimum Intrasect TRIsect Insect Protection area of the field does not have to be treated in a similar manner.

For corn rootworms – The corn rootworm refuge can be treated with a soil-applied, seed-applied, or foliar-applied insecticide for corn rootworm larval control. The corn rootworm refuge can be protected from corn borer damage by planting a hybrid with corn borer protection technology (such as HX1). Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). Pests other than adult corn rootworms can be treated on the refuge, without treating the Optimum Intrasect TRIsect Insect Protection acres. Pests on the Optimum Intrasect TRIsect Insect Protection acres can be treated as needed without having to treat the corn Refuge.

REFUGE DESIGN – Refuge Configuration Options

The refuge on each farm may be arranged in a number of different configurations that allow growers to easily incorporate an effective common refuge into their farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field or adjacent to (e.g., across the road) the Optimum Intrasect TRIsect Insect Protection hybrids.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or infield strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.

For corn borers – The corn borer refuge on each farm may be arranged in a number of configurations that allow the grower to easily incorporate an effective corn refuge into farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field, adjacent to (e.g., across the road), or as a separate block within 1/2 mile of the Optimum Intrasect TRIsect Insect Protection hybrids.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.

For corn rootworms – The corn rootworm refuge on each farm may be arranged in a number of configurations that allow the grower to easily incorporate an effective corn refuge into farm operations. The refuge should be sown on the same day, or with the shortest window possible between planting dates. Options include:

- The refuge may be planted in-field, adjacent to (e.g., across the road) the Optimum Intrasect TRIsect Insect Protection hybrids.
- In-field refuge options include: blocks, perimeter strips (i.e., along the edges or headlands), or in-field strips.
- When planting the refuge in strips across the field or as a perimeter, refuges must be at least four rows wide.

YOU MUST SIGN A TECHNOLOGY AGREEMENT, READ THE PRODUCT USE GUIDE PRIOR TO PLANTING AND FOLLOW INSECT RESISTANCE MANAGEMENT (IRM) REQUIREMENTS.
Soybean Varieties with the Genuity® Roundup Ready 2 Yield® Trait or Glyphosate Tolerant Trait

IMPORTANT: READ PRIOR TO PLANTING

Soybean varieties with Genuity® Roundup Ready 2 Yield® or other Glyphosate Tolerant traits contain in-plant tolerance to the active ingredient in Roundup® agricultural herbicides.

Weed Management
Starting clean with a weed-free field and controlling subsequent weeds when they are small is critical to obtaining excellent weed control and maximum yield potential. The Roundup Ready 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 product, can lead to increased weed competition, the potential for selecting for weed resistance and possible decreased yield.

Spray labeled glyphosate agricultural herbicides in-crop from emergence (cracking) through flowering (R2 stage soybeans) for selective weed control, proven crop safety and maximum yield potential. R2 stage soybeans end when a pod 5 millimeters (3/16”) long at one of the four uppermost nodes appears on the main stem along with a fully developed leaf (R3 stage).

Guidelines
Follow all pesticide label directions. Follow the guidelines below to help minimize the risk of developing glyphosate-resistance weed populations in a Roundup Ready Soybean System:

- 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.
- Apply additional residual herbicides for broad spectrum weed control at the recommended rates appropriate for the target weed spectrum to reduce the risk of selection for herbicide resistant bio-types.

- If using an approved glyphosate agricultural herbicide, you must refer to the label booklet or supplemental labeling for the use of that brand on soybean varieties with Genuity Roundup Ready 2 Yield or other Glyphosate Tolerant traits to determine appropriate use rates.
- Refer to individual product labels for approved tank-mix partners.
- Clean equipment before moving from field to field to help minimize the spread of weed seed.
- Report any incidences of repeated non-performance of Roundup 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 lambsquarters, waterhemp, pigweed, and giant ragweed tend to emerge throughout the season. Sequential glyphosate 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, contact your local sales representative. Approved labels, including supplemental labeling must be in the possession of the user at the time of pesticide application and can be obtained by contacting the State Pesticide Lead Agency for more information.

Various weed biotypes are known to be resistant to other herbicides as well. Use herbicides and combinations of herbicides that will control the weed biotypes and species that are present on your farm.

**GLYPHOSATE TOLERANT SOYBEAN PRODUCT USE STATEMENT:** This variety contains genes that confer tolerance to glyphosate herbicides. **WARNING:** Glyphosate herbicides will kill crops that are not tolerant to glyphosate. Glyphosate tolerance will NOT safeguard this variety against other herbicide chemistries which are labeled to be used only over-the-top of crops that have a different and specified herbicide resistance gene. Always read and follow herbicide label directions prior to use. Always follow grain marketing, stewardship practices and pesticide label directions.

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

**ROUNDUP READY 2 YIELD SOYBEAN PRODUCT USE STATEMENT:** This variety contains the Roundup Ready 2 Yield® gene, developed by Monsanto Co. **WARNING:** The Roundup Ready gene will only safeguard this variety against applications of glyphosate. The Roundup Ready gene will NOT safeguard this variety against other herbicide chemistries which are labeled to be used only over-the-top of crops that have a different and specified herbicide resistance gene. Always read and follow herbicide label directions prior to use.

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

**THIS SEED IS ACQUIRED UNDER AN AGREEMENT THAT INCLUDES THE FOLLOWING TERMS:** The licensee U.S. Patents for Genuity® Roundup Ready 2 Yield® seed can be found at the following web page www.monsantotechnology.com. IF YOU HAVE NOT SIGNED A SEED AND TECHNOLOGY USE AGREEMENT, THEN THIS DOCUMENT IS NOT AN OFFER OR ACCEPTANCE OF AN OFFER FOR SALE OF THE PRODUCTS LISTED AND ANY PURPORTED SALE OF SUCH PRODUCTS IS VOID. IF YOU HAVE RECEIVED PRODUCTS WITHOUT SIGNING A SEED AND TECHNOLOGY USE AGREEMENT, YOUR USE OF THOSE PRODUCTS IS UNAUTHORIZED AND UNLICENSED AND YOU MUST, EITHER (i) RETURN SUCH PRODUCTS, OR (ii) SIGN A TECHNOLOGY USE AGREEMENT FOR SUCH PRODUCTS.

Roundup Ready 2 Yield® is a trademark of Monsanto Technology LLC used under license.
## Soybean Varieties with Roundup Ready 2 Xtend® Technology

### IMPORTANT: READ PRIOR TO PLANTING

**Soybeans with Roundup Ready 2 Xtend® Technology**

Soybean varieties with Roundup Ready 2 Xtend technology contain in-plant tolerance to glyphosate and dicamba herbicides.

### Weed Management Guidelines

Some naturally occurring weed biotypes that are tolerant (resistant) to herbicides may exist due to genetic variability in a weed population. Where resistant biotypes exist, the repeated use of herbicides with the same modes of action can lead to the selection for resistant weeds. Certain agronomic practices delay or reduce the likelihood that resistant weed populations will develop and can be utilized to manage weed resistance once it occurs. Proactively implementing diversified weed control strategies to minimize selection for weed populations resistant to one or more herbicides is a best practice. A diversified weed management program may include the use of multiple herbicides with different modes of action and overlapping weed spectrum with or without tillage and/or other cultural practices.

Always follow label requirements and use the following best management practices for sustainable, effective weed control:

- 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.
- Apply additional residual herbicides for broad-spectrum weed control at the recommended rates appropriate for the target weed spectrum to reduce the risk of selection for herbicide resistant bio-types.
- 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 agricultural herbicides on a particular weed to the appropriate company representative, local retailer or county extension agent.

### Additional Information

Only certain dicamba formulations, such as DuPont™ FeXapan™ herbicide plus VaporGrip® Technology, are approved for use in soybeans with Roundup Ready 2 Xtend technology. Information regarding DuPont™ FeXapan™ herbicide plus VaporGrip® Technology use on soybeans with Roundup Ready 2 Xtend® technology can be found at www.FeXapan.dupont.com.

It is a violation of federal law to promote, offer to sell, or use a pesticide for an unregistered use.

Weeds such as lambquarters, waterhemp, pigweed, and giant ragweed tend to emerge throughout the season. Sequential glyphosate 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, contact your local sales representative. Approved labels, including supplemental labeling must be in the possession of the user at the time of pesticide application and can be obtained by contacting the State Pesticide Lead Agency for more information.

Various weed biotypes are known to be resistant to other herbicides as well. Use herbicides and combinations of herbicides that will control the weed biotypes and species that are present on your farm.

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### PRODUCT USE STATEMENT:

This seed contains MON 87708 and MON 89788. DO NOT APPLY DICAMBA HERBICIDE IN-CROP TO SOYBEANS WITH ROUNDUP READY 2 XTEND® TECHNOLOGY unless you use a dicamba herbicide product that is specifically labeled for that use in the location where you intend to make the application. IT IS A VIOLATION OF FEDERAL AND STATE LAW TO MAKE AN IN-CROP APPLICATION OF ANY DICAMBA HERBICIDE PRODUCT ON SOYBEANS WITH ROUNDUP READY 2 XTEND® TECHNOLOGY, OR ANY OTHER PESTICIDE APPLICATION, UNLESS THE PRODUCT LABELING SPECIFICALLY AUTHORIZES THAT USE.

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 soybeans with Roundup Ready 2 Xtend® technology.

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**WARNING:** The Roundup Ready 2 Xtend® genes will **only** safeguard this variety against applications of glyphosate and/or dicamba. The Roundup Ready 2 Xtend® genes will **NOT** safeguard this variety against other herbicide chemistries which are labeled to be used only over-the-top of crops that have a different and specified herbicide resistance gene. Always read and follow herbicide label directions prior to use.

**ACCIDENTAL APPLICATION OF INCOMPATIBLE HERBICIDES TO THIS VARIETY COULD RESULT IN TOTAL CROP LOSS. WE DO NOT WARRANT THE CROP SAFETY OR PERFORMANCE OF ANY HERBICIDES.**

**THIS SEED IS ACQUIRED UNDER AN AGREEMENT THAT INCLUDES THE FOLLOWING TERMS:** THE licensed U.S. Patents for Roundup Ready 2 Xtend® technology can be found at the following web page www.monsantotechnology.com. IF YOU HAVE NOT SIGNED A SEED AND TECHNOLOGY USE AGREEMENT, YOUR USE OF THOSE PRODUCTS LISTED AND ANY PURPORTED SALE OF SUCH PRODUCTS IS VOID. IF YOU HAVE RECEIVED PRODUCTS WITHOUT SIGNING A SEED AND TECHNOLOGY USE AGREEMENT, YOUR USE OF THOSE PRODUCTS IS UNAUTHORIZED AND UNLICENSED AND YOU MUST, EITHER (i) RETURN SUCH PRODUCTS, OR (ii) SIGN A TECHNOLOGY USE AGREEMENT FOR SUCH PRODUCTS.

Roundup Ready 2 Xtend® is a trademark of Monsanto Technology LLC used under license.
Soybeans with BOLT® Technology

IMPORTANT: READ PRIOR TO PLANTING

Why should I grow soybeans with BOLT® technology?

We are pleased to offer our customers a new herbicide system for cleaner fields and more options to adjust crop acres with changing market and growing conditions. BOLT technology now enables farmers to plant soybeans immediately following burn down with DuPont™ LeadOff® or DuPont™ Basis® Blend herbicides for effective, long-lasting control of problem weeds, pending herbicide label approval.

- Proven chemistry combined with zero-day plant-back provides cleaner fields well into the season for a stronger start.
- BOLT technology gives growers the ability to control weeds early, react to changing weather conditions and take advantage of last-minute market opportunities as they finalize planting decisions.
- LeadOff® and Basis® Blend herbicides will be labeled for burn down in soybeans with BOLT technology and com providing greater cropping flexibility.
- In wheat-soybean double crop rotations, BOLT technology provides excellent plant-back flexibility following application of DuPont™ Finesse® herbicide in wheat.
- BOLT technology enables one of the shortest plant-back intervals in the industry when soybeans follow a Finesse® application in wheat.
- BOLT technology provides additional post-emerge weed control options to control problem weeds by enabling farmers to use herbicides at rates labeled for DuPont™ STS® soybean systems. Soybeans with BOLT technology can be used with any chemistry labeled for soybeans with the STS® gene.

Management of herbicide resistance in weeds

The potential for weeds to develop resistance to herbicides must be considered when planning herbicide use. Herbicide resistance in weeds can develop and spread when a resistant plant reproduces and multiplies while being exposed to repeated use of the same herbicide mode of action.

- Maintain detailed field records so that cropping and herbicide history is known.
- Scout fields after herbicide application to detect weed escapes or shifts. If a potentially resistant weed or weed population has been detected, use available control methods to avoid seed dispersion in the field.
- Clean equipment before moving between fields and after harvest to minimize the dispersion of weed and volunteer seed.
- If you suspect a weed control failure is caused by weed resistance to an herbicide you should first contact your local sales representative.

PRODUCT USE STATEMENT: This variety contains the BOLT™ technology, developed by DuPont Pioneer. WARNING: The BOLT technology will only safeguard this variety against applications of sulfonylurea (SU) herbicides registered for use with soybeans. The BOLT technology will NOT safeguard this variety against other herbicide chemistries which are labeled to be used only over-the-top of crops that have a different and specified herbicide resistance gene. Always read and follow herbicide label directions prior to use.

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

The purchase of these seeds includes a limited license to produce a single soybean crop in the United States (or other applicable country). This license does not extend to the use of seed of such crop or the progeny thereof for propagation or seed multiplication. Furthermore, the use of such seed or the progeny thereof for propagation or seed multiplication or for production or development of a different variety of seed is strictly prohibited.

Always follow grain marketing, stewardship practices and pesticide label directions. Varieties with BOLT™ technology provide the highest degree of plant-back flexibility for soybeans following application of SU (sulfonylurea) herbicides such as DuPont™ LeadOff® or DuPont™ Basis® Blend as a component of a burndown program or for double crop soybeans following SU herbicides such as DuPont™ Finesse® applied to wheat the previous fall. DuPont™, LeadOff®, Basis® and Finesse® are trademarks of DuPont or its affiliates.
Soybeans with the LibertyLink® Trait

IMPORTANT: READ PRIOR TO PLANTING

- Soybeans with the LibertyLink® trait have built-in tolerance to Liberty® herbicide, providing excellent crop safety.
- Liberty is a nonselective contact herbicide that provides post-emergence control of broadleaf and grass weeds, including weeds resistant to glyphosate and multiple herbicide classes.
- Liberty herbicide has a unique mode of action (Group 10) that offers a nonselective choice for Integrated Weed Management plans.

APPLICATION INFORMATION & BEST WEED MANAGEMENT PRACTICES

<table>
<thead>
<tr>
<th>Weed Control Program</th>
<th>1st Post Application (Emergence to 14 days)</th>
<th>2nd Post Application</th>
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</thead>
<tbody>
<tr>
<td>Scenario One</td>
<td>Residual pre-emergence, PPI or at planting</td>
<td>Liberty herbicide at 29 fl oz/A plus residual herbicide</td>
</tr>
<tr>
<td>Scenario Two</td>
<td>Environmental conditions prevent timely application</td>
<td>Liberty herbicide at 36 fl oz/A plus residual herbicide</td>
</tr>
</tbody>
</table>

Scenario One - Residual Used Pre-emergence, PPI or At-planting:
- a. Apply Liberty herbicide at 29 fl oz/A over the top of soybeans with the LibertyLink trait from emergence to 14 days after crop emergence or when weeds are no more than 3 inches to 4 inches tall.
- b. Apply Liberty herbicide at 29 fl oz/A on an as-needed basis following the first application at 29 fl oz/A.

Scenario Two - Environmental Conditions Prevent Timely Application:
- a. If environmental conditions prevent timely Liberty herbicide applications, a single application of up to 36 fl oz/A may be made.
- b. If 36 fl oz/A is used for the first application a second application of 29 fl oz/A should be made 10 days after the first application. Increase water and shorten interval between post applications if canopy is heavy.

Additives: Ammonium sulfate (AMS) can be used at a rate of 1.5 lb/A to 3 lb/A. Rates are dependent on temperature and potential for leaf burn.

Maximum Seasonal Use: Up to 65 fl oz/A of Liberty herbicide can be applied on soybeans per growing season.

Additional Use Directions:
- a. Make all Liberty herbicide applications 70 days before soybean harvest.
- b. Make all Liberty herbicide applications before soybeans begin to bloom. Consult state Extension service for additional information on pre-bloom period for soybeans in a state.
- c. Maximum single application use rate: 36 fl oz/A.
- d. Do not apply Liberty herbicide if soybeans show injury from prior herbicide applications or environmental stress.
- e. Liberty herbicide is not labeled for application through irrigation systems.
- f. Liberty herbicide-treated fields should not be grazed or used for hay.

Tankmix Partners for Liberty® on soybeans with the LibertyLink® trait

<table>
<thead>
<tr>
<th>Assure® II (1*)</th>
<th>Flexstar® (2)</th>
<th>Phoenix™ (14)</th>
<th>Reflex® (14)</th>
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<tr>
<td>Classic® (2)</td>
<td>Fusilade® DX (1)</td>
<td>Post Plus® (1)</td>
<td>Resource® (14)</td>
</tr>
<tr>
<td>clethodim (1)</td>
<td>Fusion® (1)</td>
<td>Prefix (15, 14)</td>
<td>Select Max® (1)</td>
</tr>
<tr>
<td>Cobra® (14)</td>
<td>Harmony® GT (2)</td>
<td>Pursuit® (2)</td>
<td>Synchrony® XP (2)</td>
</tr>
<tr>
<td>FirstRate® (2)</td>
<td>metolachlor (15)</td>
<td>Raptor® (2)</td>
<td>Ultra Blazer® (14)</td>
</tr>
</tbody>
</table>

*Numbers in parentheses denote herbicide MOA as designated by the Weed Science Society of America.
KEY APPLICATION POINTS TO REMEMBER

- Uniform, thorough spray coverage is essential to achieve consistent performance.
- Use nozzles and pressure that generate a medium-size (250 microns to 350 microns) spray droplet.
- Use 15 GPA (for dense canopies, increase water volume).
- Maximum performance is achieved when applied to actively growing weeds.
- Apply from emergence to bloom growth stage.
- Sequential applications should be made at 10 days after the first application.
- Liberty herbicide is rainfast in four hours.

TOP 10 MOST FREQUENTLY SPRAYED WEEDS IN SOYBEANS

<table>
<thead>
<tr>
<th>Weed Type</th>
<th>Max. Weed Height at 29 fl oz/A²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foxtail (giant, green)</td>
<td>12&quot;</td>
</tr>
<tr>
<td>Lambquarters</td>
<td>6&quot;</td>
</tr>
<tr>
<td>Velvetleaf</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Cocklebur</td>
<td>14&quot;</td>
</tr>
<tr>
<td>Pigweed (Palmer, redroot and tumble)</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Common waterhemp</td>
<td>5&quot;</td>
</tr>
<tr>
<td>Giant ragweed</td>
<td>12&quot;</td>
</tr>
<tr>
<td>Morningglory</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Marestail¹</td>
<td>6&quot;-12&quot;</td>
</tr>
<tr>
<td>Johnsongrass</td>
<td>5&quot;</td>
</tr>
</tbody>
</table>

YIELD LOSS DUE TO COMPETITION

Weeds that emerge with the crop, or shortly thereafter, have the greatest potential to negatively affect yields. The yield loss associated with this flush of weeds is strongly influenced by how long weeds are allowed to remain in the field and compete with crops for light, water and nutrients. A recent study conducted by Iowa State University showed that waiting to remove weeds until they were 6 inches tall resulted in 10 bu/A and 14 bu/A yield loss to soybeans planted in 15-inch and 7.5-inch rows, respectively.

According to the University of Tennessee, a total of 3 million soybean acres in Arkansas, Mississippi and Tennessee showed significant yield losses due to Palmer pigweed. In Arkansas, 60% of soybean fields had unacceptable weed control. In Tennessee and Mississippi, 30% of soybean fields had unsatisfactory weed control due to Palmer pigweed.

Residual herbicides can improve weed control, reduce problematic weeds and extend the time period between planting and the first post-emergence treatment of Liberty herbicide. This allows for flexibility when weather conditions prevent timely post-emergence applications. Additionally, using a residual herbicide in your weed control program introduces another herbicide mode of action in the field, improving your resistance management program.

A study conducted by the University of Nebraska determined that the critical period for weed removal in soybeans is based upon the soybean row spacing. For soybeans planted in 30-, 15-, and 7.5-inch rows, the critical removal time is V3, V2 and first trifoliate, respectively. Furthermore, the study shows there is a 2% yield loss for every soybean leaf stage delay in applying a non-selective herbicide to the crop during the critical time for weed removal.

PRODUCT USE STATEMENT:

These seeds contain the LibertyLink trait. These seeds and the plants grown from these seeds produce the PAT (phosphinothricin acetyltransferase) protein that provides resistance to Liberty herbicide (glufosinate). YOU MUST SIGN THE TECHNOLOGY AGREEMENT AND READ THE PRODUCT USE GUIDE PRIOR TO PLANTING THESE SEEDS. You acknowledge and agree that Bayer CropScience is a third party beneficiary of the 1) Technology Agreement, 2) the Use Restrictions, Limitation of Warranty and Liability; Other Terms on this bag, and 3) the product use statements attached to this bag, and may enforce the terms and conditions in all these agreements against the purchaser of this seed bag and all persons acting on his behalf.

WARNING: You may use any glufosinate herbicide, but only if it has federally approved label instructions for use over soybeans containing the Soybean Event, and the product and the use label for such soybeans have been approved by your specific state. Contact the product manufacturer, the local retailer or the local extension agent for confirmation that the product carries EPA and state approved labeling for this use. BAYER DOES NOT MAKE ANY REPRESENTATIONS, WARRANTIES OR RECOMMENDATIONS CONCERNING THE USE OF GLUFOSINATE HERBICIDES OTHER THAN THE BAYER GLUFOSINATE HERBICIDE (LIBERTY) WHICH ARE LABELED FOR USE OVER SOYBEAN CONTAINING THE SOYBEAN EVENT. BAYER SPECIFICALLY DENIES ANY LIABILITY FOR ANY DAMAGE TO THE USE OF OTHER GLUFOSINATE HERBICIDES OVER-THE-TOP OF SOYBEANS CONTAINING THE SOYBEAN EVENT. ALL QUESTIONS AND COMPLAINTS CAUSED BY THE USE OF GLUFOSINATE HERBICIDES OTHER THAN LIBERTY SHOULD BE DIRECTED TO THE SUPPLIER OF THE PRODUCT IN QUESTION. ACCIDENTAL APPLICATIONS OF INCOMPATIBLE HERBICIDES TO THIS VARIETY COULD RESULT IN TOTAL CROP LOSS.

The herbicide resistance technology contained in these seeds is protected under one or more of the following U.S. patent number: RE44, 962 and may also be subject to other intellectual property rights. The conditional purchase of these seeds does not convey a license under said patents to perform a method covered by these patents or to use these seeds in any way, except to produce a single commercial crop (one-time use only) in the United States, and harvesting the grain solely for food or feed applications or for industrial processing. In no event shall this seed be used in research or breeding or for production of planting seed.

Liberty®, LibertyLink®, and the Water Droplet Design are trademarks of Bayer.
Why should I grow sunflower hybrids with DuPont™ ExpressSun® Tribenuron Methyl herbicide tolerant technology?

We are pleased to offer our customers herbicide tolerant technology in our sunflower hybrids. The technology combines high-yielding sunflower hybrids tailored to your regional conditions with a full package of agronomic traits and tolerance to broad-spectrum herbicides, delivering efficient, season-long weed control, crop quality, and global market acceptance.

Sunflower hybrids with the DuPont™ ExpressSun® herbicide tolerant trait are tolerant to DuPont™ EXPRESS® herbicide. The hybrids have been bred using traditional breeding techniques to provide tolerance to specific herbicides.

- The DuPont EXPRESS herbicide system provides improved weed control over non-herbicide tolerant sunflower hybrids with traditional herbicides, and gives farmers the flexibility to spray herbicides after crop emergence.
- EXPRESS herbicides contain active ingredients from the Group B herbicides. However, the herbicides are not interchangeable with other Group B herbicides; the correct herbicide must be used with the corresponding hybrid.
- EXPRESS herbicides will damage any non-herbicide tolerant sunflower hybrid.

It is imperative that good agricultural practices, the herbicide label instructions, local laws and the guidelines below are followed to preserve the efficacy of the technology and comply with all stewardship recommendations.

Management of Volunteer Sunflowers with Herbicide Tolerant Technology

As with all sunflower crops, good volunteer management is essential to avoid competitive weeds in the following crops and the build-up and spread of major diseases.

Volunteers with the herbicide tolerance traits can be controlled in crops other than sunflowers by tillage and/or non-Group B herbicide currently registered for sunflowers. Please contact your local herbicide retailer / distributor to determine the best herbicide options available.

- Plan at least a year ahead when planting sunflower hybrids with herbicide tolerant technology to include a diverse weed management plan and crop rotation that optimizes volunteer control in the next crop.
- Always employ good field hygiene in and around the fields of sunflower hybrids with herbicide tolerant technology. Control volunteers in neighbouring areas and avoid field-to-field movement of seed with planting, cultivation, and harvesting equipment.
- Prior to planting sunflower hybrids with herbicide tolerant technology, scout for volunteers and wild sunflowers in neighbouring areas. Control these by using tillage, mowing and/or non-Group B herbicides alone or in a tank mix, prior to seed set.

Why should I grow sunflower hybrids with DuPont™ ExpressSun® Tribenuron Methyl herbicide tolerant technology?

The potential for weeds to develop herbicide resistance to herbicides must be considered when planning herbicide use. Herbicide resistance in weeds can develop and spread when a resistant plant reproduces and multiplies with repeated use of the same herbicide mode of action.

- Always grow sunflower hybrids with herbicide tolerant technology in rotation with other non-herbicide tolerant crops. Use at least a 3-year crop rotation, this allows the use of alternate weed control methods, prevents build up of volunteers and also reduces pressure from common sunflower insect pests, diseases and Orobanche. As an additional good practice, avoid planting sunflower hybrids with herbicide tolerant technology in areas with a history of heavy infestations by wild sunflower.
- Do not rely on Group B herbicides for weed control across the crop rotation, but alternate modes of action at least 2 out of every 4 years on your fields. Using more than one mode of action herbicide in a mixture is a proven practice to delay the development of resistant weeds. To be effective in preventing the build up of resistance, an herbicide mixture must contain active ingredients which give high levels of control of the target weed and are from different mode of action groups. Please refer to the DuPont EXPRESS herbicide information label for more details.
- Maintain detailed field records so that cropping and herbicide history is known.
- Scout fields after herbicide application to detect weed escapes or shifts. If a potentially resistant weed or weed population has been detected, use available control methods to avoid seed dispersion in the field.
- Clean equipment before moving between fields and after harvest to minimize the dispersion of weed and volunteer sunflower seed.
- If you suspect a weed control failure is caused by weed resistance to an herbicide you should first contact your local representative.

Management of herbicide resistance in weeds

Group B herbicides, i.e., ALS inhibitors, are products based on the following chemical families: imidazolones, pyrimidines, sulfonamides, sulfonyleureas, triazolopyrimidines. For more information on herbicide groups, please follow this link: http://www.hracglobal.com/pages/classificationofherbicidesiteofaction.aspx

PRODUCT USE STATEMENT: This hybrid contains the SU7 DuPont™ ExpressSun® gene developed by DuPont. The DuPont™ ExpressSun® gene provides resistance to DuPont™ Express® brand herbicide with TotalSol™ soluble granules. WARNING: The DuPont™ ExpressSun® gene will safeguard this hybrid ONLY against applications of DuPont™ Express® brand herbicide, when applied at labeled rates. The DuPont™ ExpressSun® gene WILL NOT safeguard this hybrid against applications of other herbicides which require a different herbicide resistance gene. Always read and follow herbicide label instructions prior to use.

ACCIDENTAL APPLICATIONS OF INCOMPATIBLE HERBICIDES TO THIS HYBRID COULD RESULT IN TOTAL CROP LOSS.

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Varieties with BOLT® technology provide excellent plant-back flexibility for soybeans following application of SU Guide (PUG) or other product-specific stewardship requirements including grain marketing and pesticide label directions. Always follow grain marketing, stewardship practices and pesticide label directions in accordance with the Product Use Guide and product-specific stewardship requirements for this product. For questions regarding product stewardship and biotech traits, please contact your sales representative.

Growers are required to discuss trait acceptance and grain purchasing policies with their local grain handler prior to delivering grain containing biotech traits.

* QROME STEWARDSHIP GUIDANCE

Qrome products are approved for cultivation in the United States and Canada and have also received approval in a number of countries. DuPont Pioneer continues to pursue additional import approvals for Qrome, including in China, in accordance with Excellence Through Stewardship product launch guidance. Growers should discuss these issues with their purchaser or grain handler to confirm the purchaser or handler's position on products being purchased. For further information on the approval status of biotech traits, please visit www.biotradestatus.com. Excellence Through Stewardship® is a registered trademark of the Excellence Through Stewardship.

DuPont Pioneer (or its chemical company partners) shall have no liability whatsoever for any losses or damages resulting from, or related to, or in connection with, (a) the use of incorrect herbicides applied to sunflower hybrids that contain the herbicide-tolerant traits or (b) non-compliance with any of the other instructions set forth above, and all such liability is hereby expressly disclaimed by Pioneer and waved by you. If you have any questions on anything outlined in this document or would like additional information please contact your local representative.

To protect the usefulness and availability of these technologies for the future, growers must implement an Insect Resistance Management (IRM) program as specified in product use guides for the following traits available in corn hybrids: Herculex® I Insect Protection, Herculex® XTRA Insect Protection, Herculex® RW Insect Protection, Optimum® Leptara® Insect Protection, Optimum® AcreMax® I Insect Protection, Optimum® AcreMax® Insect Protection, Optimum® AcreMax® Xtra Insect Protection, Optimum® AcreMax® Xtra Insect Protection, Optimum® AcreMax® TRIsect® Insect Protection, Optimum® Intrasect® Insect Protection, Optimum® AcreMax® TRIsect® Insect Protection, Optimum® AcreMax® TRIsect® Insect Protection, and Optimum® AcreMax® Leptara® Insect Protection. For detailed IRM requirements for hybrids with in-plant insect resistance, refer to the appropriate product use guide, available from your sales professional.

Products are provided subject to the terms and conditions of purchase which are part of the labeling and purchase documents.