A strong stewardship program is essential for protecting and preserving the long-term value of insect-protected trait technology. Syngenta provides responsible agriculture programs and information regarding the safe handling and storage of product.

### TABLE OF CONTENTS

**SYNGENTA OVERVIEW**

- PROTECT AND PRESERVE ........................................... 3

**CORN**

- GAME-CHANGING INNOVATION .............................. 4
- UNDERSTANDING OUR TRAIT NOMENCLATURE .......... 5
- GROWER STEWARDSHIP AGREEMENT .................. 6
- WHY PLANT A REFUGE? ........................................ 7
- INSECT RESISTANCE MANAGEMENT (IRM) ............ 8
- CORN REFUGE REQUIREMENTS ......................... 9–13
- BAG TAG LABELING ............................................ 14
- TAKE ACTION PROGRAM AND REFUGE LOOKUP .... 15
- CALCULATING YOUR CORN REFUGE .................... 16
- CORN ROOTWORM BEST MANAGEMENT PRACTICES .... 17–18

**SOYBEANS**

- ROUNDUP READY 2 YIELD® ................................. 19
- ROUNDUP READY 2 XTEND® .............................. 19
- LIBERTYLINK® .................................................. 19
- ENLIST E3® SOYBEANS AND ENLIST® TRAITS .... 19
- FURTHER ASSISTANCE ...................................... 20
GAME-CHANGING INNOVATION

The Corn traits portfolio from Syngenta offers a range of technologies that help manage production challenges and protect genetic yield potential.

* Agrisure Duracade®

Agrisure Duracade® trait stacks offer the ultimate combination of the latest above and below ground insect control traits in a wide choice of diverse, high-yielding elite genetics with a simple, 5% integrated in-bag E-Z Refuge® seed blend. Agrisure Duracade trait stacks control 16 above- and below ground insects when combined with the power of Agrisure Viptera, more than any competitive stack. They offer a unique protein and multiple modes of action that make them the foundation of any corn rootworm management program.

* Agrisure Viptera

Agrisure Viptera® trait stacks provide the industry’s most comprehensive above-ground corn insect control. Controlling stalk-, ear- and leaf-feeding insects offers every plant the chance to mature and reach its full genetic yield potential. The Agrisure Viptera trait is the only trait available today that effectively controls western bean cutworm. Preventing corn ear insect feeding protects grain quality and minimizes the subsequent development of molds and mycotoxins that result from the insect injury.

* Agrisure Artesian

Agrisure Artesian® corn hybrids maximize yield when it rains, and increase yield when it doesn’t. These elite hybrids convert water to grain more efficiently than other hybrids and represent a simple, effective way to help manage the unpredictability of weather. Available in combination with best-in-class insect control and herbicide tolerance traits, Artesian™ corn hybrids can help improve yield stability and consistency on virtually any corn acre.

Products with the E-Z Refuge® seed blend offer an integrated single-bag refuge to help meet grower demand for increased convenience. They provide at least dual modes of action on key pests and are designated by “E-Z Refuge” at the end of the trait stack name.
GROWER STEWARDSHIP AGREEMENT

A strong stewardship program is essential for helping to protect and preserve the long-term value of Syngenta’s trait technology. Embracing this responsibility provides growers with ongoing choices and helps to ensure they remain good stewards of the land.

Prior to planting corn hybrids with Agrisure traits, you are required to sign a Syngenta Seeds, LLC Stewardship Agreement. This agreement outlines the terms and conditions of growing hybrids with Agrisure traits, including the terms of a limited license under Syngenta’s intellectual property, compliance with Environmental Protection Agency (EPA)-mandated IRM programs and grain channeling requirements. Deadline to have all completed agreements to Syngenta is June 30th, annually.

Agreements may be sent using the following four methods:

ONLINE
WWW.AGCELERATE.COM

Click on Register or Login
For support using the AgCelerate tool, please call AgCelerate Customer Service at 1-866-784-4630
► Easy to sign and use
► Reduces paperwork
► Simple way for growers to manage their technology agreements across all trait providers

ELECTRONIC STATEMENT
Electronic signatures will only be accepted through agcelerate.com. Any other forms of electronic signatures will be rejected.

EMAIL
AGREEMENTS@AGDATA.COM

FAX
1-704-919-5581

MAIL
AGCELERATE ATTN: STEWARDSHIP
PO BOX 221679, CHARLOTTE, NC 28222-1678

Only use one method; originals are not required. It is important that you keep a copy of the Syngenta Seeds, LLC Stewardship Agreement for your records.

If you have questions regarding the Stewardship Agreement or how to submit the form, please call 877-GRO-CORN (877-476-2676).

WHY PLANT A REFUGE?

Bacillus thuringiensis (Bt) proteins are toxic to specific pests such as the European corn borer (ECB or CB) and the corn rootworm (CRW or RW). As the number of acres exposed to these Bt products increases, so does the potential for target insect pests to develop a resistance to Bt traits. Therefore, in order to preserve this technology now and into the future, an Insect Resistance Management (IRM) plan was developed.

A major component of an IRM plan is to plant a refuge. The EPA requires a refuge on every farm that plants Bt corn hybrids. The EPA requires companies that market Bt corn hybrids to have refuge requirements and conduct a grower compliance program. IRM education and compliance are uniform across the U.S. corn industry to ensure a consistent IRM message.

The refuge maintains a population of insect pests susceptible to the Bt proteins produced in insect-protected Bt corn. These susceptible pests mate with any insect pests that are resistant to the Bt proteins. Susceptibility is then passed on to offspring, helping preserve the long-term effectiveness of insect-protected Bt corn products.

REFUGE STRATEGY – HOW IT WORKS

The U.S. Environmental Protection Agency (EPA) requires a refuge on every farm that plants insect-protected corn hybrids. Failure to plant the appropriate refuge jeopardizes your continued access to Agrisure technology.
INSECT RESISTANCE MANAGEMENT (IRM)

IRM COMPLIANCE ASSURANCE PROGRAM
Syngenta and other industry registrants have cooperatively developed the EPA-mandated IRM Compliance Assurance Program. This program requires corn seed companies to evaluate the extent to which growers are adhering to the IRM requirements and ensure that those who do not are brought back into compliance. Growers who do not meet IRM requirements for two years within a five-year period will be denied access to hybrids with Agrisure insect-protected traits in the third year as mandated by the EPA.

ON-FARM ASSESSMENTS
As part of the product registration with the EPA, Syngenta and other seed companies are required to conduct IRM assessments to help ensure growers are planting the correct refuge on their farms. Growers are selected using a set of risk-based criteria, and assessed with a series of questions that must be conducted in person with the grower or their representative. Following each on-farm assessment, it will be determined if the grower is in compliance.

All trait providers are required to participate and conduct a third-party company to complete all assessments during the growing season (June – September).

Growers found to be out of compliance with the refuge requirements jeopardize their access to Bt corn products. They will receive a letter informing them of their compliance infraction, reminding them of their compliance obligations and the consequences of not adhering to the requirements. Included in each letter will be further information on how to develop and implement a suitable IRM program for their farm. Additionally, any grower found to be out of compliance will receive a follow-up IRM assessment the next growing season.

IRM TIP LINE
If you have any seed stewardship questions or become aware of individuals not following proper IRM practices as noted in this guide, please contact the tips and complaints toll-free phone line at 1-877-GRO-CORN (1-877-476-2676).

Growers are encouraged to scout their fields. If unexpected damage is observed, please contact your seed reseller or company representative.

CORN REFUGE REQUIREMENTS

SIZE REQUIREMENTS ARE BASED ON GEOGRAPHY AND PRODUCT

- 5% OR 20% REFUGE - CORN GROWING AREAS
- 20% OR 50% REFUGE - COTTON GROWING AREAS

THE FOLLOWING STATES AND COUNTRIES ARE CONSIDERED CORN-GROWING AREAS, REPRESENTED BY LIGHT GREEN SHADING:
- Alaska
- Arizona
- California
- Colorado
- Connecticut
- Delaware
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

THE FOLLOWING STATES AND COUNTRIES ARE CONSIDERED COTTON-GROWING AREAS, REPRESENTED BY BLUE SHADING:
- Alabama
- Arkansas
- Florida
- Georgia
- Louisiana
- Mississippi
- North Carolina
- Oklahoma
- South Carolina
- Tennessee
- Texas
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

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- Maryland
- Massachusetts
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- Minnesota
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Dakota
- Tennessee
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- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
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- Louisiana
- Mississippi
- North Carolina
- Oklahoma
- South Carolina
- Tennessee
- Texas
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming
CORN REFUGE REQUIREMENTS

*Only required for non E-Z Refuge products

** KEY **
- INSECT-PROTECTED BT CORN
- BELOW-GROUND PEST REFUGE (RR)
- OR
- ABOVE-GROUND PEST REFUGE (CB)
- BELOW-GROUND AND ABOVE-GROUND PEST REFUGE (RR/CB)

** SINGLE PEST REFUGE **
A single pest refuge is a field that serves solely as a refuge for above-ground pests (e.g., European corn borer) or below-ground pests (e.g., corn rootworm), but not both. The single pest refuge approach can be used for both single Bt corn products and stacked Bt corn products (also known as the Separate Refuge option).

** SINGLE BT CORN PRODUCTS (E.G., AGRISURE VIPTERA® 3110) **

```
          OR
[Above-ground pests] ≤ ½ MILE [Above-ground pests]
```

** STACKED BT CORN PRODUCTS (E.G., AGRISURE VIPTERA 31111) **

```
          ≤ ½ MILE
[Below-ground pests] [Above-ground pests]
```

** COMMON REFUGE **
A common refuge is a field or area of corn that serves as a refuge for both above-ground pests (e.g., European corn borer) and below-ground pests (e.g., corn rootworm) at the same time. The refuge can be within the Bt field or immediately adjacent to it.

** STACKED BT CORN PRODUCTS (E.G., AGRISURE® 3000GT) **

```
          AND
[Below-ground pests] [Above-ground pests]
```

** INSECT-PROTECTED BT CORN **

- BELOW-GROUND PEST REFUGE (RW)
- ABOVE-GROUND PEST REFUGE (CB)
- BELOW-GROUND AND ABOVE-GROUND PEST REFUGE (RW/CB)

** CORN REFUGE REQUIREMENTS **

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>SIZE REQUIREMENT (CORN-GROWING REGION)</th>
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</thead>
<tbody>
<tr>
<td>Agrisure Duracade®</td>
<td>No additional refuge required</td>
<td>20% supplemental refuge</td>
<td>Within or adjacent</td>
</tr>
<tr>
<td>Agrisure GT/LL</td>
<td>No additional refuge required</td>
<td>20% supplemental refuge</td>
<td>Within or adjacent</td>
</tr>
<tr>
<td>Agrisure® 3122</td>
<td>No additional refuge required</td>
<td>20% supplemental refuge</td>
<td>Within or adjacent</td>
</tr>
<tr>
<td>Agrisure Artesian®</td>
<td>20%</td>
<td>20%</td>
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</tr>
<tr>
<td>Agrisure 3000GT</td>
<td>20%</td>
<td>50%</td>
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</tr>
<tr>
<td>Agrisure Vperta®</td>
<td>No additional refuge required</td>
<td>20% supplemental refuge</td>
<td>Within, adjacent, or up to 1/2 mile away</td>
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Important: Always read and follow label and bag tag instructions; only those labeled as tolerant to glufosinate ammonium-based herbicides. Under federal and local laws, only dicamba-containing herbicides registered for use on dicamba-tolerant varieties may be applied to crops. See product labels for more information.

```
Refuge size is calculated by applying the appropriate percentage (e.g., 25%, 50%) to the TOTAL CORN ACRES.

1 Only applicable in the cotton-growing region when a supplemental 20% refuge is required for this product.
2 Assumes a separate corn borer and rootworm refuge. Alternatively, a separate rootworm refuge within or adjacent to the Bt field and a corn borer refuge up to 1/2 mile away can be planted.
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1 Only applicable in the cotton-growing region when a supplemental 20% refuge is required for this product.
2 Assumes a separate corn borer and rootworm refuge. Alternatively, a separate rootworm refuge within or adjacent to the Bt field and a corn borer refuge up to 1/2 mile away can be planted.
```

**PRODUCT SIZE REQUIREMENT**

**SIZE REQUIREMENT (COTTON-GROWING REGION)**

**DISTANCE REQUIREMENTS**
**CORN REFUGE REQUIREMENTS**

*Only required for non E-Z Refuge products*

**REFUGE PLANTING OPTIONS**
Refuge can be planted as a block, strips within the field, perimeter around the field, adjacent or a separate block within 1/2 mile of the field.

- 1/2 mile option may only be used for corn borer refuge
- A neighbor’s field does NOT meet the refuge requirements

**STRIP REFUGE**
Four Row Minimum – Strips, blocks, or perimeter refuges must be a minimum of four contiguous rows wide to provide ample space for bug mating.

**TREATMENT**
Corn Borer Treatment – Non-Bt foliar insecticide treatments for corn borer control may be applied only if economic thresholds are reached for one or more pests. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants).

Corn Rootworm Treatment – Insecticide treatments for control of corn rootworm larvae may be applied. If rootworm adults are present at time of foliar applications, then corn fields with the Agrisure trait must be treated in a similar manner as the refuge.

**REFUGE MANAGEMENT**
Refuge should be planted with a hybrid that is agronomically similar to and managed similar to your corn with Agrisure traits.

If a rootworm refuge is planted in a field that is in a crop rotation system, the corn hybrids with Agrisure traits must also be planted in a field that is in a crop rotation system.

If the rootworm refuge is planted on continuous corn, the corn hybrids with Agrisure traits may be planted on either continuous or in a crop rotation system.

Reminder: When calculating a refuge, the calculation must be based on total corn acres.
**BAG TAG LABELING**

Before filling your planter, always check the bag tag to ensure you know the refuge size requirement.

---

**TAKE ACTION PROGRAM AND REFUGE LOOKUP**

Take Action Insect-Resistance Management is a farmer-focused educational platform designed to help farmers implement Bt stewardship practices. Take Action is an industry-wide partnership between university scientists, seed biotech companies, including Syngenta, commodity organizations and National Corn Growers Association (NCGA) to create resources and tools to help our growers plan how to meet the minimum refuge requirements and how to implement best management practices on their farm.

To find out more about how you can take action, visit www.iwiltakeaction.com/insects

---

**Calculating IRM Compliance**

**Refuge Planting**

- 20% or 50%, structured refuge required
- 5% or 20%, structured refuge required

**Refuge Location**

REFUGE | CORN/GROWING AREA

**Refuge Size**

- 20% or 50%, structured refuge required

**Strip Refuge**

(for a 20% refuge product.)

**Assess Risk:**

- 20% or 50%, structured refuge required

---

**Larval CRW Management Considerations**

- Consult with extension, consultants or other local experts for recommendations when considering control of CRW in Bt-traited corn hybrids except for reducing CRW beetle populations.

**Best Management Practices**

- Did you observe root injury from CRW larvae?
- Did you plant the same CRW traits for consecutive years in the same fields?
- Multiple sprays may be necessary.
- Foliar sprays may be an option if CRW beetle populations reach an economic threshold for feed on corn silks and may reduce yield. (typically July and August) as adult CRW beetles may be needed the following year.

- Experiencing problems with CRW in areas where rotational-resistant CRW may be needed the following year.
- CRW populations are high in long-term continuous corn system.
- Rotate at least every third year if any seed, soil, or crop rotation products with multiple modes of action for CRW control is not an option, use a non-Bt-traited hybrid with a non-Bt insect-protection trait for reducing CRW beetle populations.
- Use Bt hybrids with multiple modes of action for CRW control whenever possible.

---

**The Agricultural Biotechnology Stewardship Technical Committee, National Corn Growers Association and all other Take Action partners neither recommend nor discourage the implementation of any advice contained herein, and are not liable for the use or misuse of the information provided.**
CALCULATING YOUR CORN REFUGE

Reminder: when calculating a refuge, the calculation must be based on total corn acres. This section outlines the right and wrong way to calculate a refuge.

Refer to this diagram for the examples provided on below.

A Total Corn Acres*
B Refuge Acres
C Bt Acres
D Percent of Required Refuge (based on total corn acres)

*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 WRONG WAY TO CALCULATE

Do NOT multiply the amount of Bt acres or seed by the percent of refuge required.

Example
C 160 x 20% = B 32

This is NOT the correct minimum refuge size.

THE CORRECT WAY TO CALCULATE

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.

Example
A 200 x 20% = B 40

Your Field

NEXT subtract your refuge acres from your total corn acres.

This is your maximum Bt ACRES.

Example
A 200 - B 40 = C 160

Your Field

CORN ROOTWORM

BEST MANAGEMENT PRACTICES

To effectively manage corn rootworm (CRW), implement a multイヤ year plan that includes a variety of tactics.

CROP ROTATION

PRODUCTS WITH
MULTIPLE CRW BT 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

2. ROTATE CROPS
   Rotate at least every third year if any of the following apply:
   - In long-term continuous corn system
   - CRW populations are high
   - Experiencing problems with CRW trait performance

Corn rootworm management options may be needed the year following corn in areas where northern CRW extended diapause or western CRW variant are present.

3. ROTATE TRAITS
   Use Bt 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 Bt-traited hybrid that controls CRW.
   Use a non-Bt-treated hybrid with insecticide.

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).
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 Bt-traited corn hybrids except under limited circumstances.
Consult with extension, 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 Bt corn hybrids.

Prior to planting Syngenta soybean varieties with the Roundup Ready 2 Yield®, Roundup Ready 2 Xtend®, LibertyLink® Enlist E3® soybeans and Enlist® traits, growers are required to sign a Syngenta Seeds, LLC Stewardship Agreement. This agreement outlines the terms and conditions of growing Syngenta brand soybean varieties with Roundup Ready 2 Yield, Roundup Ready 2 Xtend, LibertyLink, Enlist E3 and Enlist traits, including the terms of a limited license under Syngenta’s intellectual property.
Growers must sign and have on file the US03 version of the Syngenta Seeds, LLC Stewardship Agreement by June 30, annually.
Agreement may be sent in using one of the four methods:
- ONLINE
  WWW.AGCELERATE.COM
- EMAIL
  AGREEMENTS@AGDATA.COM
- FAX
  1-704-919-5581
- MAIL
  AGCELERATE ATTN: STEWARDSHIP
  PO BOX 221679, CHARLOTTE, NC 28222-1678
Use only one method, original is not needed. It is important that you keep a copy of the Syngenta Seeds, LLC Stewardship Agreement for your records.
Always read and follow pesticide label directions. IT IS A VIOLATION OF FEDERAL AND STATE LAW to use any pesticide product other than in accordance with its labeling. See product label for details and tank-mix partners. Not all formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. May not be approved in all states. 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 Roundup Ready 2 Xtend® soybeans.

**ENLIST E3 SOYBEANS, ENLIST TRAITS, ROUNDUP READY 2 YIELD, ROUNDUP READY 2 XTEND AND LIBERTYLINK**

1. PLANT THE REQUIRED REFUGE
2. ROTATE CROPS
3. ROTATE TRAITS
   Use Bt 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 Bt-traited hybrid that controls CRW.
   Use a non-Bt-treated hybrid with insecticide.


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FURTHER ASSISTANCE

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Regulatory and Market Status of Agricultural Biotechnology Products
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Take Action Education Platform
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