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## 2013 Insect Resistance Management Stewardship Guide

For U.S. Corn and Cotton-Growing Areas

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## **THANK YOU FOR CHOOSING AGRISURE® TECHNOLOGY**

Agrisure CB/LL trait stack provides season-long control or suppression of the following insects: European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, sugarcane borer, common stalk borer, and glufosinate tolerance.

Agrisure GT/CB/LL trait stack provides season-long control or suppression of the following insects: European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, sugarcane borer, common stalk borer as well as herbicide flexibility with both glyphosate and glufosinate tolerance.

Agrisure3000GT trait stack provides growers control or suppression of the following insects: European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, sugarcane borer, common stalk borer, western corn rootworm, northern corn rootworm, Mexican corn rootworm, and herbicide flexibility with both glyphosate and glutosinate tolerance.

Agrisure Artesian technology helps deliver more yield under moisture stress conditions. This product offers control or suppression of the following insects: European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, sugarcane borer, common stalk borer, western corn rootworm, northern corn rootworm, Mexican corn rootworm, and herbicide flexibility with both glyphosate and glutosinate tolerance.

AgrisureViptera<sup>®</sup> trait stack provides season-long control from the following insects: <sup>3100</sup> European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, dingy cutworm, beet armyworm, black cutworm, western bean cutworm, sugarcane borer, common stalk borer, and herbicide flexibility with both glyphosate and glutosinate tolerance.

AgrisureViptera trait stack provides growers unsurpassed multi-pest control of the following insects: European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, dingy cutworm, beet armyworm, black cutworm, western bean cutworm, sugarcane borer, western corn rootworm, northern corn rootworm, Mexican corn rootworm, common stalk borer, and herbicide flexibility with both glyphosate and glutosinate tolerance.

Agrisure3122 E-Z Refuge<sup>\*</sup> trait stack provides growers control or suppression of the following insects: European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, black cutworm, western bean cutworm, sugarcane borer, lesser cornstalk borer, common stalk borer, western corn rootworm, northern corn rootworm, and Mexican corn rootworm.

AgrisureViptera trait stack delivers control of the following insects: European 3220 E-Z Refuge corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, beet armyworm, black cutworm, western bean cutworm, sugarcane borer, dingy cutworm, lesser cornstalk borer, and common stalk borer.

## WHAT'S IN A NAME: AGRISURE NOMENCLATURE

To help growers understand the competitive advantage of Agrisure Traits as the original and most innovative traits system, Syngenta has a streamlined naming system for its traits technologies. The naming system, which begins with the Agrisure Viptera<sup>®</sup> 3111 trait stack and will apply to all future trait stacks, creates consistency for delivery of new technology and trait stacking opportunities.

#### Benefits of Agrisure Traits naming system:

- Captures technology descriptions and trait indicators.
- Enables use of the current Agrisure master brand for current and successive trait launches.
- Provides clear and logical advancement for successive trait additions and technology innovations.

#### What growers will see:



On each seed bag tag, growers will see four numbers. Each number has a meaning. How it works:

## **Agrisure** [Viptera] [3]

- Brand suffix changes with new technologies
  - Indicates technology series (herbicide tolerance now; other benefits in the future)
  - Identifiers signal the presence and number of modes of action in hybrid:
    - Broad lepidopteran presence/number of modes of action
    - Corn borer presence/number of modes of action
    - Rootworm presence/number of modes of action

## **GROWER STEWARDSHIP AGREEMENT**

A strong stewardship program is essential for protecting and preserving the long-term value of Agrisure trait technology. Embracing this responsibility provides growers with ongoing choices and ensures they remain good stewards of the land.

**Prior to planting corn hybrids with Agrisure traits**, you are <u>required</u> to sign a Syngenta Seeds, Inc. 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.

**Syngenta Stewardship Agreements are available** online and can be signed electronically by following this link http://www.myagrisure.com.

Deadline to have all completed agreements into Syngenta is June 30th.

Agreements may be sent in using one of the four methods:

#### Online

http://www.myagrisure.com

- Click on Stewardship tab
- Register icon is in upper right hand corner

#### E-mail

syngenta.stewardship@syngenta.com

#### Fax

800.858.8664

#### Mail

Syngenta Seeds, Inc. Attn: Agrisure Stewardship P.O. Box 959 Minneapolis, MN 55440



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

If you have questions regarding the Agreement or how to submit the form, please call 877-GRO-CORN (877-476-2676). Grower will be notified of their technology number via mail.

## **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. EPA requires companies that market Bt corn hybrids to have structured 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.

#### Refuge Strategy – How it Works

The refuge maintains a population of insect pests susceptible to the Bt proteins produced in insectprotected 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.





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) is a series of production practices that delay or prevent pests from developing resistance to Bt technology.

#### **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 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 contract 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 instructional 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 Tips Line**

If you have any seed stewardship questions or become aware of individuals not following proper IRM practices as noted in this guide, please call 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.



#### Size Requirements are Based on Geography and Product

The following states and counties are considered corn-growing areas. Represented by light blue shading.

Alaska Kansas Arizona Kentuckv California Maine Colorado Maryland Connecticut Massachusetts Delaware Michigan Hawaii Minnesota Missouri (all counties except Dunklin, Illinois New Madrid, Pemiscot, Indiana Scott, & Stoddard) Montana

Idaho

Iowa

Nebraska Nevada **New Hampshire** New Jersey New Mexico New York North Dakota Ohio Oklahoma (all counties except Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman, & Washita)

Oregon Pennsvlvania Rhode Island South Dakota Tennessee (all counties except Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby, & Tipton)

Texas (only the counties of Carson, Dallam, Hanford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts, & Sherman

#### Utah

Vermont Virginia (all counties except Dinwiddie, Franklin City, Greensville, Isle of

Wright, Northampton,

Southampton, Suffolk

City, Surrey, & Sussex)

Washington West Virginia Wisconsin Wyoming

#### The following states and counties are considered cotton-growing areas. Represented by dark blue shading.

Alabama	North Carolina	Tennessee (only	Texas (all	Virginia (only
Arkansas	Oklahoma (only	the counties of Carroll Chester	counties except Carson Dallam	the counties of Dinwiddie Franklin
Florida	the counties of Reckham, Caddo	Crockett, Dyer,	Hanford, Hartley,	City, Greensville,
Georgia	Comanche, Custer,	Fayette, Franklin, Gibson Hardoman	Hutchinson, Linscomh Moore	Isle of Wright, Northampton
Louisiana	Greer, Harmon,	Hardin, Haywood,	Ochiltree, Roberts,	Southampton,
Mississippi	Kiowa, Tillman,	Lake, Lauderdale,	& Sherman)	Suffolk City, Surrey,
Missouri (only the counties of Dunklin, New Madrid, Pemiscot, Scott, & Stoddard)	& Washita) South Carolina	Dincom, Madison, Obion, Rutherford, Shelby, & Tipton		& Sussex)

#### 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).



#### **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.



Product	Size Requirement (Corn-growing Region)	Size Requirement (Cotton-growing Region)	Distance Requirements
AgrisureCB/LL	20%	50%	Within, adjacent, or up to 1/2 mile away
AgrisureGT/CB/LL	20%	50%	Within, adjacent, or up to 1/2 mile away
Agrisure3000GT	20%	50%	Within or Adjacent <sup>1</sup>
Agrisure Artesian	20%	50%	Within or Adjacent <sup>1</sup>
	20%	20%	Within, adjacent, or up to 1/2 mile away
Agrisure Viptera	20%	20%	Within or Adjacent <sup>1</sup>
	No additional refuge required	20% supplemental refuge <sup>1</sup>	Within or Adjacent <sup>2</sup>
Agrisure Viptera 3220 E-Z Refuge	No additional refuge required	20% supplemental refuge	Within, adjacent, or up to 1/2 mile away <sup>2</sup>

Refuge size is calculated by applying the appropriate percentage (e.g., 20%, 50%) to the TOTAL CORN ACRES.

<sup>1</sup> Assumes a common corn borer and rootworm refuge. Alternatively, a separate rootworm refuge within or adjacent to the Bt field and a corn borer refuge up to <sup>1</sup>/<sub>2</sub> mile away could be planted.

<sup>2</sup> Only applicable in the cotton-growing region where a supplemental 20% refuge is required for this product.

#### **Refuge Planting Options**

Refuge can be planted as a block, strips within the field, perimeter around the field, adjacent or a separate block within a ½ 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



Reminder: when calculating a refuge, the calculation must be based on total corn acres.

#### **Strip Refuge**

**4 ROW Minimum** – Strips, blocks, or perimeter refuges must be a minimum of 4 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.

#### **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.

## **CALCULATING YOUR CORN REFUGE**

#### **Refuge Calculator**

National Corn Growers Association (NCGA) in collaboration with the industry has developed a free web-based calculator to help growers plan how to meet the minimum refuge requirements for each of the Bt corn products on their farm.

This calculator can be downloaded at **www.irmcalculator.com**.



#### Why this tool is good:

- FREE
- Downloadable on your smart phone
- Will calculate amount of refuge needed based upon your growing area and trait(s) you're planting
- Calculate quantity of standard seed bags to purchase
- Displays possible planting options for your products



Scan this QR code to start planning your refuge today.

## **NEW BAG TAG LABELING**

Recently, we implemented a new labeling system on all bag tags to include refuge size requirements for Agrisure products. Before filling your planter, check the bag tag to ensure you know the refuge size requirement.



## **CALCULATING IRM REFUGE SIZE**

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 page 15.



- B Refuge Acres
- **B**t Acres
- 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





## **CALCULATING IRM REFUGE SIZE**

#### The Wrong Way to Calculate

(Example shown is for a 20% refuge product where the grower plans to plant 160 acres of Bt corn)

Do **NOT** multiply the amount of Bt acres or This is **NOT** the correct seed by the percent of refuge required. minimum refuge size. 20% Example 160 Х The Correct Way to Calculate (Example shown is for a 20% refuge product where the grower plans to plant 200 acres of total corn) **START** with the **TOTAL** Multiply by the This is your **PERCENT** of number of corn acres minimum **REFUGE ACRES.** you want to plant in refuge required for the Bt trait. an area. 20% 200 40 Example Х Your Field Х = **NEXT** subtract your refuge acres from This is your maximum Bt ACRES. your total corn acres. Example 200 160 40 Your Field

## GENUITY<sup>®</sup> ROUNDUP READY<sup>®</sup> ALFALFA & GENUITY<sup>®</sup> ROUNDUP READY 2 YIELD<sup>®</sup> SOYBEANS

#### 2013 NEXGROW<sup>™</sup> Genuity<sup>®</sup> Roundup Ready<sup>®</sup> Alfalfa Stewardship Requirements

All growers purchasing NEXGROW Genuity<sup>®</sup> Roundup Ready<sup>®</sup> alfalfa must have a renewed Monsanto Technology Stewardship Agreement (MTSA) prior to sale.

The MTSA can be accessed by visiting **www.renewmtsa.com**.

Please note the previous requirement for growers to provide GPS coordinates for all fields planted to Genuity<sup>®</sup> Roundup Ready<sup>®</sup> alfalfa is no longer required for purchases made after August 1st, 2012.

#### 2013 NK<sup>®</sup> Brand Genuity<sup>®</sup> Roundup Ready 2 Yield<sup>®</sup> Soybeans

All growers purchasing NK Brand Genuity<sup>®</sup> Roundup Ready 2 Yield<sup>®</sup> soybeans are required to sign a Syngenta Stewardship Agreement. The agreement outlines the terms and conditions of growing soybeans with the Genuity<sup>®</sup> Roundup Ready 2 Yield<sup>®</sup> technology and grants the grower a limited use license to purchase and plant this technology for a single commercial grain crop. All agreements can be returned to the stewardship department as outlined on page 4.

#### **NOTES**



© 2012 Syngenta. Important: Always read and follow all bag tag and label instructions before buying or using Syngenta products. The instructions contain important conditions of sale, including limitations of warranty and remedy. Some crop protection products and seed treatments may not be registered for sale or use in all states or counties. Please check with your state or local extension service before buying or using these Syngenta products. Crops or other material produced from Agrisure Corn Trait products can only be exported to, used, processed and/or sold in countries where all necessary regulatory approvals have been granted.

Based on the decision of the U.S. Department of Agriculture (USDA) on January 27, 2011, Genuity® Roundup Ready® Alfalfa seed is available for sale and distribution by authorized Seed Companies or their dealers for use in the United States only. This seed may not be planted outside of the United States, or for the production of seed, or sprouts.

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ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Roundup Ready<sup>®</sup> crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup<sup>®</sup> brand agricultural herbicides. Roundup<sup>®</sup> brand agricultural herbicides will kill crops that are not tolerant to glyphosate. Genuity and Design<sup>®</sup>, Genuity Icons, Genuity<sup>®</sup>, Roundup Ready<sup>®</sup>, and Roundup<sup>®</sup> are trademarks of Monsanto Technology LLC.