

# Agrisure® Traits Stewardship Guide

- Agrisure Technology Stewardship
- Insect Resistance Management
- Refuge Requirements
- Grain Marketing
- Agrisure Traits Status



# Table of Contents

<b>Agrisure® Corn Traits Technology</b> .....	<b>3</b>
<b>Agrisure Technology Stewardship</b> .....	<b>4</b>
<b>Insect Resistance Management</b> .....	<b>4</b>
<b>Refuge Requirements</b> .....	<b>7</b>
Differences in CB/LL and RW Requirements.....	7
Agrisure CB/LL and Agrisure GT/CB/LL.....	8
Agrisure RW and Agrisure GT/RW .....	12
Agrisure CB/LL/RW and Agrisure 3000GT .....	15
<b>Grain Marketing with Biotech Corn Traits</b> .....	<b>21</b>
<b>Agrisure Traits Status</b> .....	<b>22</b>
<b>Pollen Movement</b> .....	<b>25</b>
<b>Weed Resistance Management</b> .....	<b>27</b>

# Thank you for choosing Agrisure® technology



Congratulations on your purchase of Agrisure® Corn Traits! Agrisure technology offers a full line of high-performing corn traits with herbicide tolerance and insect protection that are built for maximizing the yield potential of your hybrids.

**Agrisure GT** provides exceptional tolerance to in-crop applications of glyphosate-based herbicides. Corn hybrids with Agrisure GT are carefully selected to provide not only outstanding glyphosate tolerance via the trait, but also to preserve the genetic potential of the hybrid via the proven advanced trait transformation process.

**Agrisure CB/LL** allows hybrids to reach their maximum yield by providing excellent control of European corn borer (ECB) plus other damaging insects. Agrisure CB/LL features the Bt11 event, which has been protecting cornfields since it was introduced in 1997. In addition, all hybrids with Agrisure CB/LL are tolerant to LIBERTY® herbicide (glufosinate), providing growers with another trait option for weed control.

**Agrisure RW** offers excellent built-in control of Northern, Western and Mexican corn rootworms in leading hybrids, offering outstanding yield results. Agrisure RW has been placed in leading Syngenta genetics utilizing an industry-leading trait transformation process that ensures hybrids will reach their full yield potential.

**Innovative stacked combinations** are available in 2008, including **Agrisure GT/RW**, **Agrisure GT/CB/LL**, **Agrisure CB/LL/RW** and **Agrisure 3000GT (GT/CB/LL/RW)**.

## **Agrisure Technology Stewardship**

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 required to sign an Agrisure 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 EPA-mandated IRM programs and grain channeling requirements.

Syngenta will keep all returned agreements on file, periodically providing updates, if necessary, to keep growers informed of any new recommendations or requirements.

In addition, planting hybrids with Agrisure GT, Agrisure CB/LL or Agrisure RW (including any stack combinations) requires special considerations which are outlined in this publication.

## **Insect Resistance Management**

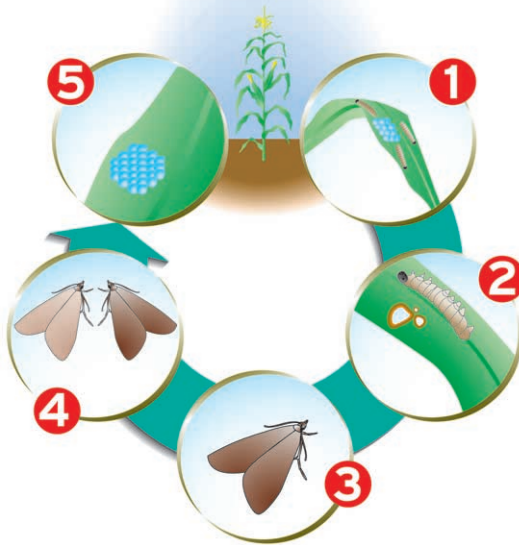


The U.S. Environmental Protection Agency (EPA) requires a refuge on every farm that plants insect-protected corn hybrids. Failure to plant the appropriate refuge jeopardizes your continued access to Agrisure technology.

### ***Planting Refuges, Preserving Technology***

Insect resistance management is a series of production practices that delay or prevent pests from developing resistance to insect-protected hybrids. An important component of a successful management plan is to plant a block of corn that does not control the target pest(s), known as a refuge, near your insect-protected corn hybrids. The refuge sustains a population of susceptible target pests to mate with any rare resistant species that may emerge from these same or nearby corn hybrids.

## Using ECB As An Example - How A Refuge Strategy Can Prevent Or Slow Resistance



- 1 Corn borers emerge and attempt to feed on corn hybrids with Agrisure CB/LL.
- 2 Corn borer larvae ingest proteins from corn hybrids with Agrisure CB/LL and vast majority of borers die within 72 hours.
- 3 A very few rare resistant corn borers may live to mature to moths.
- 4 These rare resistant moths encounter susceptible moths from nearby refuge. When they mate, their offspring remain susceptible to corn hybrids with Agrisure CB/LL.
- 5 These susceptible moths lay eggs and the cycle begins again.

### IRM Compliance Assurance Program

Syngenta Seeds and other industry registrants of trait products that provide insect-protected hybrids have cooperatively developed the EPA-mandated Insect Resistance Management (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 consecutive years will be denied access to hybrids with Agrisure insect-protected traits in the third year.

## **On-Farm Assessments**

To assess compliance, Syngenta Seeds and other seed companies will conduct on-farm IRM assessments of randomly selected customers who purchased hybrids with Agrisure insect-protected traits. Following each on-farm assessment, it will be determined if the grower is in compliance.

## **Responding to Non-Compliance**

All growers found to be out of compliance 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**

Seed companies that sell insect-protected hybrids are required by the EPA to establish a system to collect information about alleged instances of non-compliance with the IRM requirements. Syngenta Seeds has established a toll-free IRM Tips & Complaints phone line, which is 1-866-SYNGENT.

## **Other IRM Tools**

Use the Insect Resistance Management Learning Center (IRMLC) to learn more about IRM. It is a web-based tool developed by the National Corn Growers Association (NCGA) with the support of Syngenta and other leading agricultural biotechnology companies. The IRMLC allows corn growers to access training on several topics, including IRM, Compliance Assurance Program (CAP), Integrated Pest Management (IPM), corn borer and corn rootworm. The IRMLC can be accessed directly at [www.agrisuretraits.com](http://www.agrisuretraits.com) or [www.ncga.com](http://www.ncga.com).

## Agrisure RW vs Agrisure CB/LL Refuge Requirements

Agrisure products containing Agrisure RW require a refuge plan that differs from refuge plans that growers have become accustomed to with corn borer protected corn such as Agrisure CB/LL. The table below highlights the main differences in their requirements:

	Agrisure CB/LL	Agrisure RW
Size of Refuge	A minimum of 20% of total corn acres (50% in cotton growing areas).	Minimum of 20% total corn acres in all areas.
Refuge Distance	Within one-half (1/2) mile of Agrisure CB/LL corn fields	Within or adjacent (e.g., across the road) to Agrisure RW corn fields.
Refuge Insecticide Use	May be applied to refuge only if economic thresholds are reached. Bt based insecticides cannot be used.	Soil applied and seed applied insecticides may be used. Insecticides used to control corn rootworm adults may be used IF Agrisure RW is treated also.

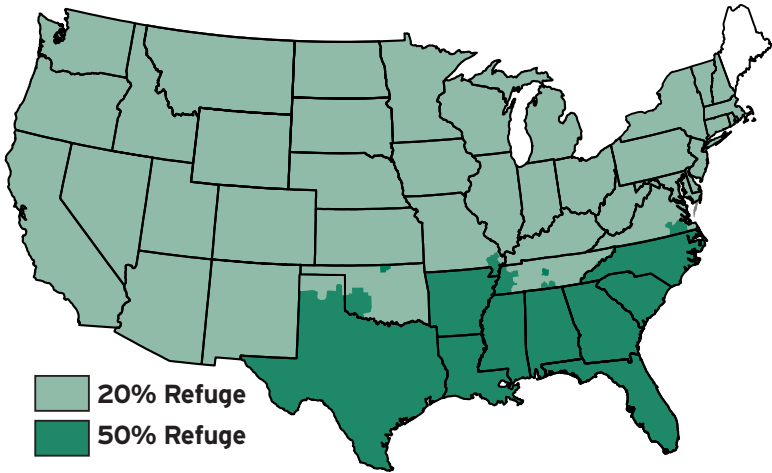
For products that contain stacked insect protection traits (such as Agrisure CB/LL/RW and Agrisure 3000GT) the refuge plan must meet both the requirements of the Agrisure CB/LL and Agrisure RW. (Please refer to the associated trait section for complete refuge requirements.)

## Agrisure CB/LL and Agrisure GT/CB/LL Refuge Requirements

Agrisure products containing Agrisure CB/LL (including the stack combination Agrisure GT/CB/LL) require a corn borer refuge plan. A corn borer refuge is a field or area of corn that does not contain Agrisure CB/LL or other trait products for controlling ECB. Each grower planting corn hybrids with Agrisure CB/LL must plant his own refuge. The refuge may be planted in a variety of configurations as illustrated in this stewardship guide. Specific requirements for the corn borer refuge are as follows:

1. A minimum of **20 percent** of field corn acres must be planted to corn hybrids that do not control corn borer (the corn borer refuge may contain corn hybrids that control corn rootworm, such as Agrisure RW). If you plant corn hybrids with Agrisure CB/LL in cotton-growing regions (see p. 8 for map and list of cotton-growing areas), you must plant a minimum of **50 percent** refuge.
2. The corn borer refuge must be placed within one-half mile of corn hybrids with Agrisure CB/LL; however, a one-fourth (1/4) mile distance is preferred.
3. A neighbor's field does not meet the refuge requirement.
4. Refuge Insecticide Treatment requirements:
  - a. Insecticide treatment for controlling European Corn Borer (ECB), corn earworm (CEW) and/or Southwestern Corn Borer (SWCB) may be applied to the refuge if economic thresholds are reached for one or more of these target pests. Contact local or regional professionals, such as your county extension agent, if you have questions regarding the economic threshold of target pests.
  - b. Bt-based microbial insecticides may not be applied to the corn refuges.
5. The corn borer refuge should be planted with a hybrid that is agronomically similar to and managed similar to your corn with Agrisure CB/LL.

## Cotton-Growing\* Regions Required to Plant 50% Refuge Corn



**Alabama** – all counties

**Arkansas** – all counties

**Florida** – all counties

**Georgia** – all counties

**Louisiana** – all counties

**Mississippi** – all counties

**Missouri** – counties of:

Dunklin     Scott  
New Madrid     Stoddard  
Pemiscot

**North Carolina** – all counties

**Oklahoma** – counties of:

Beckham     Jackson  
Caddo     Kay  
Comanche     Kiowa  
Custer     Tillman  
Greer     Washita  
Harmon

**South Carolina** – all counties

**Tennessee** – counties of:

Carroll     Haywood  
Chester     Lake  
Crockett     Lauderdale  
Dyer     Lincoln  
Fayette     Madison  
Franklin     Obion  
Gibson     Rutherford  
Hardeman     Shelby  
Hardin     Tipton

**Texas** – all counties **EXCEPT**:

Carson     Lipscomb  
Dallam     Moore  
Hansford     Ochiltree  
Hartley     Roberts  
Hutchinson     Sherman

(NOTE: these counties are required to plant at least 20% refuge corn)

**Virginia** – counties of:

Dinwiddie     Southampton  
Franklin City     Suffolk City  
Greensville     Surrey  
Isle of Wight     Sussex  
Northampton

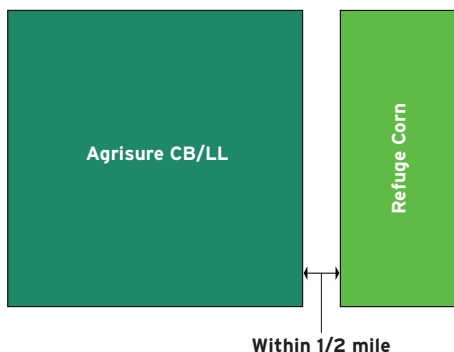
\* Identified by EPA as cotton growing areas.

## Corn Borer Refuge Configurations

### Examples of Refuge Configuration Options

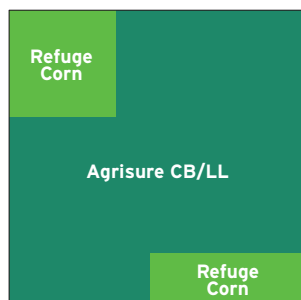
The refuge field is planted to only refuge hybrids and does not contain any corn hybrids with Agrisure CB/LL. In this pattern as well as others, the refuge must account for at least 20 percent of the total corn acres and must be planted within 1/2 mile of the corn hybrids with Agrisure CB/LL.

#### Separate Fields



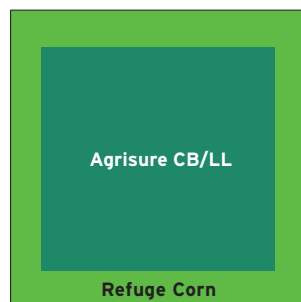
Refuge corn and corn hybrids with Agrisure CB/LL are planted in large blocks in the same field.

#### Blocks



Refuge is planted around the sides of the field. Requires planting a minimum of 4 rows wide (preferably 6 rows) of refuge corn.

#### Perimeter



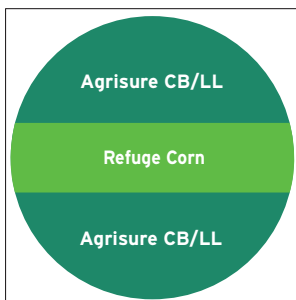
Refuge corn strips must be at least 4 rows (preferably 6 rows) wide.

### Adjacent Multiple Rows



Strip of refuge corn between two areas of corn with Agrisure CB/LL in an irrigated field.

### Block Within Pivot



-  Agrisure CB/LL or Agrisure GT/CB/LL
-  Corn Borer Refuge

## **Agrisure RW and Agrisure GT/RW Refuge Requirements**

Agrisure products containing Agrisure RW (including the stack combination Agrisure GT/RW) require a corn rootworm refuge plan. A corn rootworm refuge is a field or area of corn that does not contain Agrisure RW or other trait products for controlling corn rootworm. Each grower planting corn hybrids with Agrisure RW must plant his own corn rootworm refuge. The corn rootworm refuge may be planted in a variety of configurations as illustrated in this stewardship guide. Specific requirements for the corn rootworm refuge are as follows:

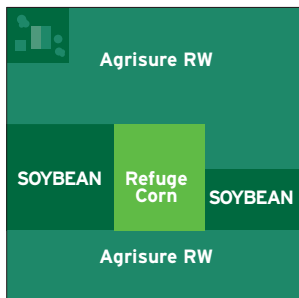
1. A minimum of 20 percent of field corn acres must be planted to corn hybrids that do not control corn rootworm (the corn rootworm refuge may contain corn hybrids that control corn borers, such as Agrisure CB/LL).
2. Corn rootworm refuge planting options include blocks within or adjacent to Agrisure RW corn fields, perimeter strips or in-field strips.
  - a. The corn rootworm refuge must be planted within or immediately adjacent (e.g., across the road) to Agrisure RW corn fields.
  - b. Corn rootworm refuge planted as in-field or perimeter strips must be at least 4 consecutive rows wide, but the preference is for 6 rows.
3. A neighbor's field does not meet the refuge requirement.
4. Refuge Insecticide Treatment Options
  - a. The corn rootworm refuge corn acres can be treated for corn rootworm larvae and other soil pests with a soil-applied or seed-applied insecticide.
  - b. Insecticides labeled for control of corn rootworm adults can be applied to the corn rootworm refuge provided the field with Agrisure RW corn hybrids is treated in a similar manner.
5. The corn rootworm refuge should be planted with a hybrid that is agronomically similar to and managed similar to your corn with Agrisure RW.
6. The corn rootworm refuge should be planted in fields with a similar history as the Agrisure RW.
  - a. If the corn rootworm refuge is planted in a field that is in a crop rotation system, the corn hybrids with Agrisure RW must also be planted in a field that is in a crop rotation system.
  - b. If the corn rootworm refuge is planted on continuous corn, the corn hybrids with Agrisure RW may be planted on either continuous or in a crop rotation system.

## Corn Rootworm Refuge Configurations

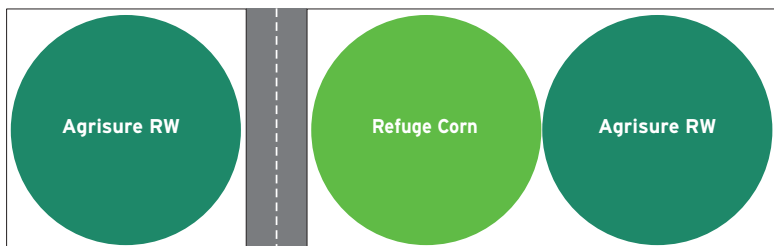
### Examples of Refuge Configuration Options

The refuge field is planted to only refuge hybrids and does not contain any corn hybrids with Agrisure RW. In these patterns the refuge must be planted in either an adjacent field or in fields separated by a road, path or ditch.

#### Adjacent Fields

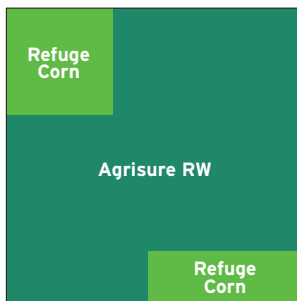


#### Separated By a Road



Refuge corn and corn hybrids with Agrisure RW are planted in large blocks in the same field.

#### Blocks



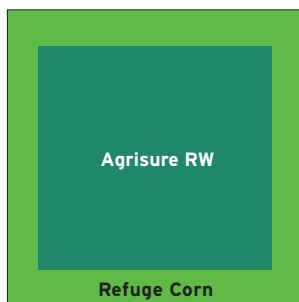
Refuge corn strips must be at least 4 rows (preferably 6 rows) wide.



### Adjacent Multiple Rows



Refuge is planted around the sides of the field. Requires planting a minimum of 4 rows wide (preferably 6 rows) of refuge corn.

### Perimeter



-  Agrisure RW or Agrisure GT/RW
-  Corn Rootworm Refuge

# Agrisure CB/LL/RW and Agrisure 3000GT Refuge Requirements

Agrisure products containing the stacked insect protection traits Agrisure CB/LL and Agrisure RW require a refuge plan. Two refuge options are available to growers planting corn hybrids with Agrisure CB/LL/RW (including the stack combination Agrisure 3000GT). The first option, planting a block of corn that serves as a refuge for both corn borers and corn rootworms, is referred to as a *common refuge*.

The second option available to growers requires planting a *separate refuge* for corn borers **and** a *separate refuge* for corn rootworms.

## Common Refuge Planting Requirements

A *common refuge* is a field or area of corn that does not contain Agrisure CB/LL/RW or other trait products for controlling corn borers and/or corn rootworms. Each grower planting corn hybrids with Agrisure CB/LL/RW must plant his own refuge. The refuge may be planted in a variety of configurations as illustrated in this stewardship guide.

Specific requirements for the *common refuge* are as follows:

1. A minimum of 20 percent of field corn acres must be planted to corn hybrids that do not control corn borer and/or corn rootworm. If you plant corn hybrids with Agrisure CB/LL/RW in cotton-growing regions, you must plant a minimum of 50 percent refuge (see p. 8 for map and list of cotton growing areas).
2. *Common Refuge* planting options include blocks adjacent to Agrisure CB/LL/RW corn fields, perimeter strips or in-field strips.
  - a. The *common refuge* must be planted within or immediately adjacent (e.g., across the road) to Agrisure CB/LL/RW corn fields.
  - b. *Common refuge* planted as in-field or perimeter strips must be at least 4 consecutive rows wide, but the preference is for 6 rows.
3. A neighbor's field does not meet the refuge requirement.
4. *Common Refuge* Insecticide Treatment requirements:
  - a. Insecticide treatment for controlling European Corn Borer (ECB), corn earworm (CEW) and/or Southwestern Corn Borer (SWCB) may be applied to the refuge if economic thresholds are reached for one or more of these target pests. Contact local or regional professionals, such as your county extension agent, if you have questions regarding the economic threshold of target pests.
  - b. Bt-based microbial insecticides may not be applied to the corn refuges.
  - c. The *common refuge* corn acres can be treated for corn rootworm larvae and other soil pests with a soil-applied or seed-applied insecticide.

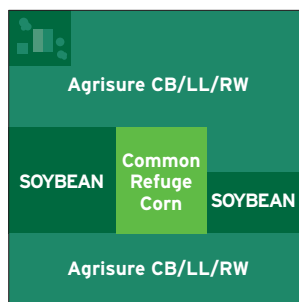
- d. Insecticides labeled for control of corn rootworm adults can be applied to the *common refuge* provided the field with Agrisure CB/LL/RW hybrids is treated in a similar manner.
5. The *common refuge* should be planted with a hybrid that is agronomically similar to and managed similarly to your corn with Agrisure CB/LL/RW.
  6. The *common refuge* should be planted in fields with a similar history as the Agrisure CB/LL/RW.
    - a. If the *common refuge* is planted in a field that is in a crop rotation system, the corn hybrids with Agrisure CB/LL/RW must also be planted in a field that is in a crop rotation system.
    - b. If the *common refuge* is planted on continuous corn, the corn hybrids with Agrisure CB/LL/RW may be planted on either continuous or in a crop rotation system.

## Corn Borer/Rootworm *Common Refuge* Configurations

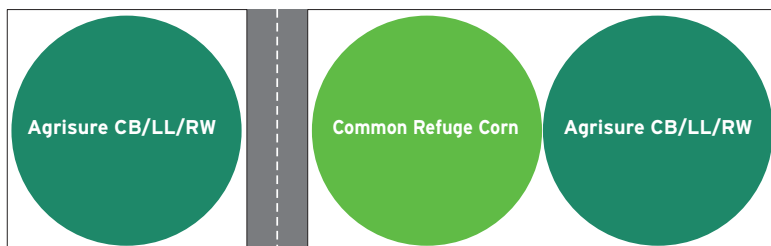
### Examples of Refuge Configuration Options

The refuge field is planted to only refuge hybrids and does not contain any corn hybrids with Agrisure CB/LL/RW or other trait products for controlling corn borers and/or corn rootworms. In these patterns the refuge must be planted in either an adjacent field or in fields separated by a road, path or ditch.

#### Adjacent Fields



#### Separated By a Road

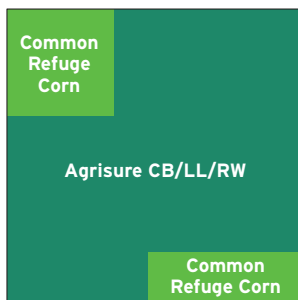


 Agrisure CB/LL/RW or Agrisure 3000GT

 Common Refuge

Refuge corn and corn hybrids with Agrisure CB/LL/RW are planted in large blocks in the same field.

### Blocks



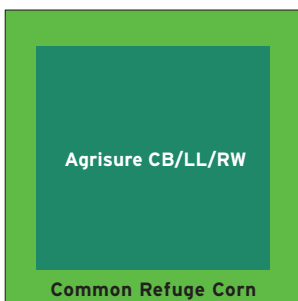
Refuge corn strips must be at least 4 rows (preferably 6 rows) wide.

### Adjacent Multiple Rows



Refuge is planted around the sides of the field. Requires planting a minimum of 4 rows wide (preferably 6 rows) of refuge corn.

### Perimeter



-  Agrisure CB/LL/RW or Agrisure 3000GT
-  Common Refuge

## **Separate Refuge Planting Requirements**

This option requires planting a *separate refuge* for corn borers **and** a *separate refuge* for corn rootworms.

- A *separate corn borer refuge* is a field or area of corn that does not contain Agrisure CB/LL/RW or other trait products for controlling ECB.
- A *separate corn rootworm refuge* is a field or area of corn that does not contain Agrisure CB/LL/RW or other trait products for controlling rootworm.

### *Separate Corn Borer Refuge\**

1. A minimum of 20 percent of field corn acres must be planted to corn hybrids that do not control corn borer (the corn borer refuge may contain corn hybrids with Agrisure GT or conventional hybrids). If you plant corn hybrids with Agrisure CB/LL/RW in cotton-growing regions\*, you must plant a minimum of 50 percent refuge.
2. The corn borer refuge must be placed within one-half mile of corn hybrids with Agrisure CB/LL/RW; however, a one-fourth (1/4) mile distance is preferred.
3. The corn borer refuge corn acres may be treated with a non-Bt foliar insecticide for corn borer if economic thresholds are met.\*

### *Separate Corn Rootworm Refuge\*\**

1. A minimum of 20 percent of field corn acres must be planted to corn hybrids that do not control corn rootworm (the corn rootworm refuge may contain corn hybrids that control corn borers, such as Agrisure CB/LL).

\*Please refer to the section Agrisure CB/LL Refuge Requirements beginning on page 7 for more detailed information, including specific requirements for cotton-growing areas.

\*\* Please refer to the section Agrisure RW Refuge Requirements beginning on page 11 for more detailed information.

2. Corn rootworm refuge planting options include blocks adjacent to Agrisure CB/LL/RW corn fields, perimeter strips or in-field strips.
  - a. The corn rootworm refuge must be planted within or immediately adjacent (e.g., across the road) to Agrisure CB/LL/RW corn fields.
  - b. Corn rootworm refuge planted as in-field or perimeter strips must be at least 4 consecutive rows wide, but the preference is for 6 rows.
3. The corn rootworm refuge corn acres can be treated for corn rootworm larvae and other soil pests with a soil-applied or seed-applied insecticide. They may also be treated with a non-Bt foliar insecticide for late season pests; however, if corn rootworm adults are present, the field with Agrisure CB/LL/RW must be treated in a similar manner.\*\*

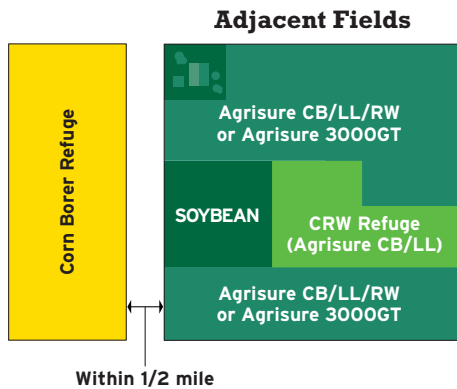
\*\* Please refer to the section Agrisure RW Refuge Requirements beginning on page 11 for more detailed information.

## Corn Borer/Rootworm *Separate Refuge* Configurations

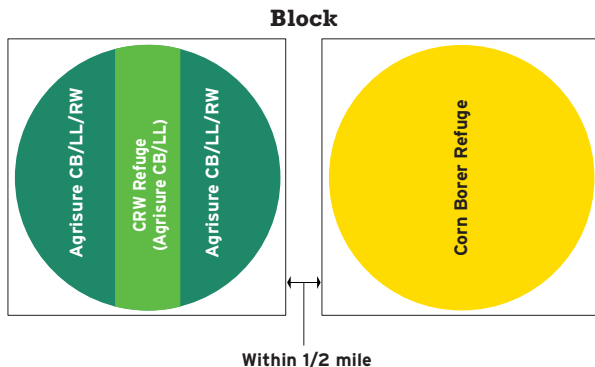
### Examples of Refuge Configuration Options

- Agrisure CB/LL is planted as the refuge for corn rootworm
- The refuge field for corn borer is planted within 1/2 mile of the fields with Agrisure CB/LL/RW

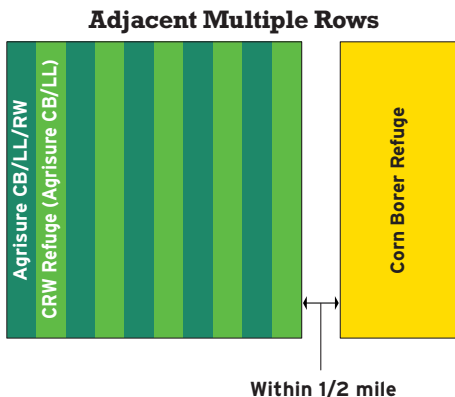
The refuge field for corn rootworm is adjacent to or separated by a road, path or ditch.



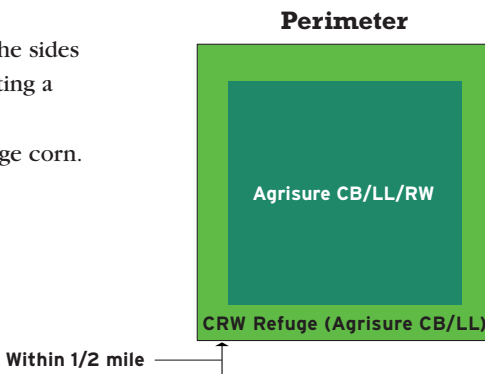
Refuge corn for corn rootworm planted in large block in the same field.



Refuge corn strips for corn rootworm must be at least 4 rows (preferably 6 rows) wide.



Refuge is planted around the sides of the field. Requires planting a minimum of 4 rows wide (preferably 6 rows) of refuge corn.



- Agrisure CB/LL/RW or Agrisure 3000GT
- Corn Rootworm Refuge (Agrisure CB/LL)
- Corn Borer Refuge

## Grain Marketing with Biotech Corn Traits

All biotech corn trait events must be approved by the U.S. Department of Agriculture and the U.S. Food and Drug Administration before hybrids containing them can be planted. Pesticidal events also require approval of the U.S. Environmental Protection Agency. In addition, grain harvested from U.S.-approved hybrids can only be exported to nations that have authorized the event. It is the responsibility of the trait provider to obtain authorization, which is usually provided on a trait-by-trait basis. Hence many combinations of traits (stacks) require separate authorizations.

- Japan, currently the largest importer of U.S. grain, has granted several approvals for grain containing biotech corn traits in recent years, including GA21, Bt11 and MIR 604.
- European Union (EU) customers have significantly curtailed imports of whole grain to reduce the risk of importing corn containing unapproved biotech traits.
  - o Currently, the primary U.S. corn shipped to the EU is corn gluten feed, a by-product from the corn wet-milling process.
  - o Recently, the EU has approved processed feed containing many of the commercial traits sold in the U.S. market.
  - o Exports of distiller's dry grain with solubles (DDGS), the co-product of dry-mill ethanol production, are beginning to find markets in the EU.
- To minimize the risk of grain with unapproved biotech traits entering the EU market, the U.S. corn seed industry developed a comprehensive program that educates and informs corn growers and grain handlers on the proper handling of harvested grain from hybrids containing these corn events.



- o The Market Choices® logo is used on seed packaging and marketing materials to communicate to growers that grain harvested from these products is not approved in the EU.
- o Growers must find a market for this grain that will not ship this grain or its processed products to the EU.

## Agrisure Traits Status<sup>+</sup>

	U.S. Approval	EU Food Approval	EU Processed Feed Approval	Japan Approval
	Yes	Yes	Yes	Yes
	Yes	No**	No**	Pending
	Yes	Yes*	Yes*	Yes
	Yes	No**	No**	Yes
	Yes	No**	No**	Pending
	Yes	No**	No**	Yes
	Yes	No**	No**	Yes

\* This event does not have whole grain import approval in the EU.

\*\* Grain harvested from corn hybrids containing these traits is not fully approved for grain export to the European Union. The grain must be directed away from export channels that supply the EU. For more information on your grain market options, contact your seed supplier.

+ The above chart is current as of November 2007. For the most recent regulatory update status, visit [www.agrisuretraits.com](http://www.agrisuretraits.com).

## **Agrisure CB/LL**

Grain from Agrisure CB/LL hybrids is fully approved in the United States, Canada, Japan and Europe, and has no grain marketing or grain channeling restrictions.

## **Agrisure GT**

Grain from hybrids with Agrisure GT is fully approved in the United States, Canada and Japan. Whole grain from hybrids with Agrisure GT is not yet approved for human food and animal feed in the EU. Currently, Syngenta is working closely with the EU regulatory authorities to secure approvals for Agrisure GT and stacks with other Agrisure corn traits. In the interim, grain from hybrids with Agrisure GT must be marketed under the Market Choices program.

For 2008, the EU will accept corn gluten, corn gluten feed and distillers dry grain with soluble (DDGS) produced from grain harvested from hybrids containing Agrisure GT. Since these are the primary corn products shipped to the EU, growers have a variety of grain marketing options available to them. We recommend growers talk with their grain buyers about these options.

### **Appropriate markets for corn harvested with Agrisure GT include:**

- On-farm feeding
- Domestic feed lots
- Grain handlers, feed mills, and dry grind ethanol plants that have agreed to accept grain awaiting EU approval

The American Seed Trade Association (ASTA) web site at [www.amseed.org](http://www.amseed.org) provides a list of grain handlers (Grain Handlers' Database) and their positions on accepting corn traits not yet approved by the EU. This information can also be obtained by calling 1-866-SYNGENT.

## **Agrisure GT/CB/LL, Agrisure RW, Agrisure GT/RW, Agrisure CB/LL/RW and Agrisure 3000GT**

Grain harvested from corn hybrids containing Agrisure GT/CB/LL, Agrisure RW, Agrisure GT/RW, Agrisure CB/LL/RW and Agrisure 3000GT are fully approved for food and feed use in the United States and Japan. Corn hybrids with these traits will be sold under the Market Choices program ([www.amseed.org](http://www.amseed.org)) which asks growers not to deliver grain to facilities that will be supplying the EU.

### **Market Choices**

Grain harvested from products that bear this mark is fully approved for food and feed use in the United States and Japan, but is not approved in the European Union. You must find a market for this crop that will not ship this grain or its processed products to Europe. Appropriate markets for this grain include: domestic feed use or grain handlers that specifically agree to accept this grain and handle it appropriately. For more information on your grain market options, go to the American Seed Trade Association's website at [www.amseed.org](http://www.amseed.org) or call your seed supplier.



Market Choices® is a registered certification mark used under license from ASTA. Know Before You Grow™ is an information service provided by the National Corn Growers Association at [www.ncga.com](http://www.ncga.com).

## Pollen Movement

A normal occurrence in corn production is cross-pollination, the movement of a very small amount of pollen between neighboring fields. It is not possible to achieve 100% purity of seed or grain in any corn production system and a certain amount of adventitious pollen movement will occur. As some fields may carry genetically improved traits, it is important to understand the conditions and factors that influence the amount of pollen movement. We encourage you to consider these factors and talk with your neighbors to understand each other's cropping intentions. If neighboring cornfields are food-grade, hybrid-seed or specialty export production, please contact your seed company rep to develop an approved isolation correction plan.

- **Pollen load in a given field.** The amount of pollen produced is in most cases enough to pollinate the silks of the plants in that field. Once pollination has occurred, the silks will no longer receive other pollen grains. The in-field pollen competition cuts down greatly on the chance of cross-pollination in neighboring fields.
- **Overlap of pollination period between neighboring fields.** Corn silks are only receptive to pollen for a period of 5 to 20 days. The timing is affected by factors such as weather, planting period and maturity of hybrids. In order for any cross-pollination to occur, competing pollen must be present during this period of time.
- **Proximity of fields.** Studies have shown that most cross-pollination occurs between fields located within 30 feet downwind from another, with most taking place within the first several rows of the field. To combat this, many contracts for growers of white and waxy corn require them to remove the outside 12 rows to ensure the removal of impurities from cross-pollination.
- **Distance traveled by pollen.** Environmental factors such as wind direction and speed, temperature and humidity all affect how far pollen will travel, and will vary by the day.
- **Set-up of given fields.** The size and orientation of the neighboring fields influence how they are affected by wind during the pollination period.

## **Identity Preserved Production**

Identity Preserved (IP) corn is intended for specific markets, such as seed corn, waxy, high oil, high amylase, high lysine, organic and non-genetically enhanced corn. It is up to growers to ensure the identity of their crops through IP certification and therefore receive the benefit for specifying its purity.

By choosing to certify their crops as IP, it is the responsibility of growers to implement any means necessary in order to meet such standards.

The industry has created a set of guidelines that is intended to manage IP-production needs. Such practices include crop isolation, the management of pollen flow and crop mixing, buffer rows and planned differences in planting schedules. The extra measures taken to ensure IP crops are often accompanied by slight increases in production costs, while growers are often rewarded with higher prices for the goods sold.

## Weed Resistance Management

The effect of herbicide resistance should factor into your weed management decisions. Over-use of any weed control technology opens the door to weed population shifts and/or herbicide resistance. That's why it's important to rotate or use multiple herbicide modes of action in any weed control system. By including a weed resistance management program, you can ensure the continued benefits of all corn technologies.

At Syngenta, we take great pride in being proactive to protect your crop production investments. In addition to providing you with a wide array of seed and herbicide technologies, Syngenta also provides straightforward recommendations against the development of resistant weeds. These recommendations were developed with input from leading weed science experts in the U.S. and around the world. These recommendations include:

- Diversify glyphosate-dependent weed control programs with alternative herbicides or cultural practices.
- In glyphosate-tolerant corn and soybean systems, do not use more than two applications of a glyphosate-based herbicide over a two-year period. Diversify with alternative herbicides and cultural practices.
- Use alternative burndown or residual herbicides in glyphosate-tolerant crops likely to require more than one application of glyphosate.
- Rotate glyphosate-tolerant crops with conventional crops to manage weed resistant volunteers.
- Use the full label rate of glyphosate and tank mix partner to minimize weed escapes.
- Monitor treated weed populations for any loss of field efficacy.

Contact your local extension specialist, certified crop advisor and/or manufacturer for herbicide-resistant recommendations for specific crops and resistant weed biotypes.

**Agrisure®**  
**CB/LL**



**LIBERTY**  
**LINK**

**Agrisure®**  
**CB/LL/RW**



**LIBERTY**  
**LINK**

**Agrisure®**  
**GT**

**Agrisure®**  
**GT/CB/LL**



**LIBERTY**  
**LINK**

**Agrisure®**  
**3000GT**



**LIBERTY**  
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**Agrisure®**  
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**Agrisure®**  
**RW**

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[www.agrisuretraits.com](http://www.agrisuretraits.com)

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