

2014 Pioneer Hi-Bred Seed and Technology Use Agreement

This Seed and Technology Agreement (Agreement) is entered into between you (Recipient) and Pioneer Hi-Bred International, Inc. (Pioneer) and provides Recipient the opportunity to plant proprietary plant varieties and hybrids including but not limited to alfalfa, canola, wheat, corn, soybean, sunflower, sorghum (Seed). The Agreement covers plant varieties which have intellectual property protection, which may include plant variety certificates, confidential information, trade secrets and patents including but not limited to patented germplasm, transgenic traits, native traits, transformation technologies, methods of use of said plants, breeding methods, plants containing the Roundup Ready® gene, the Roundup Ready® Corn 2 gene, the LibertyLink® gene, Herculex® I insect protection trait, Herculex® RW rootworm protection trait, Herculex® XTRA traits, the YieldGard® Corn Borer gene, the Agrisure Viptera® 3110 trait stack, the Agrisure® RW gene, Plenish™, other traits and technologies and/or any combination of these traits and technologies (Technologies). This Agreement is for a Recipient of Seed for planting only as approved by Pioneer. The term of this Agreement, and the license contained herein, shall begin on the date the Agreement is duly entered into and signed by the Recipient. The Agreement will remain in effect until terminated in writing by Recipient or Pioneer, whichever event is earlier. Any termination notice by Recipient must be delivered to Pioneer Hi-Bred, 7100 NW 62nd Avenue, PO Box 1014, Johnston, IA 50131-1014, Attn: TTL Representative. If the Agreement is terminated pursuant to such notice, Recipient's obligations under this Agreement shall survive as to Seed and Technologies previously received. A non-exhaustive list of Seeds and Technologies that are applicable to this Agreement will be maintained at <http://www.pioneer.com/technologyagreement> (Website) which will be updated at least yearly. Continuing to use the Seed and Technologies listed herein, on the Website, or listed on the bag or tag, subject to this Agreement, is an affirmation and an agreement that Recipient is bound by these terms. If Recipient has previously signed a Technology Agreement with Pioneer, this Agreement replaces and terminates any previous agreements.

This Agreement provides Recipient a limited non-exclusive right to plant Pioneer brand Seed and Technologies anywhere in the United States, Subject to and conditioned on compliance with the rights and restrictions set forth in this Agreement as well as the restrictions set forth on the bag and tag accompanying the Seed, which is incorporated by reference into and is part of this Agreement. See bag and tag for important information regarding terms and conditions for using the Seed and Technologies as well as Limitation of Warranty and Arbitration, under state seed laws, where applicable.

BY USING SEED AND TECHNOLOGIES SUPPLIED IN CONNECTION WITH THIS AGREEMENT RECIPIENT IS OBLIGATED, UNDERSTANDS, ACKNOWLEDGES AND AGREES:

- Not to use plants produced from the Seeds and Technologies or their progeny for breeding purposes.
- To not analyze the plants, seeds, or products produced therefrom, or their progeny, produced from or containing the Seed and Technologies, with molecular techniques which include, but are not limited to, any method to determine the content, amount or sequence of the DNA, RNA, or protein, and not to assist anyone in doing same.
- To allow Pioneer, its employees, agents or representatives entry onto the land where the Seed is planted to sample seeds, equipment, bins, storage areas, work areas, and/or plants and any combination thereof to establish compliance with this Agreement and all other agreements between Pioneer and Recipient. Pioneer will attempt to provide oral or written notice prior to entry.
- That the Seed and Technologies include subject matter owned by Pioneer, or licensed from a third party, which are protected under U.S. intellectual property laws which include rights under plant variety certificates, confidential information, trade secrets and patents including but not limited to patented germplasm, transgenic traits, native traits, transformation technologies, methods of use of said plants, breeding methods.
- To use the Seed and Technologies-only in locations where the products have been approved for use by all required governmental agencies. See the appropriate Product Use Guide(s), which is incorporated into and is part of this Agreement, for the applicable Technologies and for more information on their use.
- To comply with certain grain marketing, channeling and stewardship responsibilities required for some of these products due to their regulatory approval status outside of the United States.
- To use the Seed and Technologies only for planting as approved by Pioneer, and agree not to sell, save, replant or otherwise use Seed from that crop for planting for a second or subsequent year.
- To not supply any of the Seed or its progeny and/or any plants, plant parts or components of Seed or progeny to any other person or entity for planting, research, use of molecular techniques, without the prior written consent of Pioneer, and not to save any crop produced from the Seed for replanting, or supply saved Seed to anyone for replanting.
- To comply with all rights and restrictions set forth on the bag and tag accompanying the Seed.
- To implement an Insect Resistance Management (IRM) program as specified in the appropriate Product Use Guide(s), comply with IRM requirements, and cooperate with IRM programs, on-farm IRM compliance assessments and research. The IRM program requires Recipient to plant a corn refuge and follow EPA-mandated use restrictions as outlined in the appropriate Product Use Guide(s). Please refer to the appropriate Product Use Guide(s) for specific details related to these terms including refuge size, refuge distance and management requirements.
- To follow IRM requirements. Failure to follow IRM requirements can result in loss of access to corn borer protected and corn



rootworm protected hybrids for at least one year.

- That Recipient's information such as name, address, and phone number(s), which Pioneer has on file, may be sent to a third party auditor to conduct an IRM compliance assessment.
- To cooperate with the third party conducting an on-farm IRM compliance assessment.
- To provide Pioneer, at Pioneer's request, copies of any records, receipts, or other documents that could be relevant to Recipient's performance of this Agreement, to the extent allowable by law.
- That the IRM requirements set forth in Product Use Guides and referred to in this Technology Agreement supersede the IRM requirements set forth in any previously executed agreement or Product Use Guide.

General Conditions:

- The Recipient's rights may not be transferred to anyone other than a duly authorized agent of the Recipient without written consent of Pioneer. Recipient agrees to notify in writing the person or entity receiving the transferred rights that the Seed planted on the land is subject to this Agreement, and the person or entity receiving the transferred rights must have or obtain their own Agreement. If the Recipient's rights are transferred with Pioneer's consent or by operation of law, this Agreement is binding on the person or entity receiving the transferred rights. Further, if Recipient purchases or leases any new land that has Seed planted on it by a previous owner or possessor, Recipient will accept and continue the obligations of this Agreement.
- If the Recipient intentionally breaches this Agreement, in addition to other penalties, the Recipient's rights under this Agreement will terminate immediately and the Recipient forfeits any right to obtain a license to the Seed and Technologies in the future. Any obligations that arose before termination will continue in effect.
- If Recipient unintentionally breaches any of Recipient's material obligations under this Agreement, Pioneer has the option to terminate the Agreement.
- If any portion of this agreement is found to be unenforceable, the remainder of the agreement will be held valid.

RECIPIENT, BY SIGNATURE ON THIS DOCUMENT, AGREES THAT ALL OTHER PARTIES RELEVANT TO THIS AGREEMENT ARE BOUND BY THIS AGREEMENT, INCLUDING BUT NOT LIMITED TO ANY LAND OWNER, CONTRACTOR, EMPLOYEE, AND/OR AGENT THAT MAY HAVE CONTROL OVER ANY PART OF THE LAND, EQUIPMENT, OR SEED PROVIDED.

If Recipient has any questions about this Agreement, please contact Pioneer at 800-247-6803 and ask for a TTL Representative. For details of the required IRM program and requirements, see the appropriate Product Use Guide(s). A copy is available from Pioneer. Licensed or applicable U.S. patents include: for corn hybrids containing the Roundup Ready gene - 5,554,798; 5,593,874; 5,641,876; 5,717,084; 5,728,925; 6,025,545; 6,083,878; 6,825,400; and RE39,247; for soybeans containing the Roundup Ready gene - 5,717,084; 5,728,925; and RE39,247; for corn hybrids containing YieldGard Corn Borer protection- 5,859,347; 5,424,412; 5,484,956; 5,593,874; and 6,180,774; for corn hybrids containing Herculex I insect protection- 5,510,474; 5,550,318; 6,218,188; and 6,943,282; for corn hybrids containing Herculex RW rootworm protection-5,510,474; 6,083,499; 6,127,180; 6,340,593; 6,548,291; 6,624,145; 6,893,872 and 6,943,282; for corn hybrids containing Herculex XTRA insect protection- 5,510,474; 5,550,318; 6,083,499; 6,127,180; 6,218,188; 6,340,593; 6,548,291; 6,573,240; 6,624,145; 6,737,273; 6,893,872; and 6,943,282. Also see Website (www.pioneer.com/technologyagreement).

By signing below, Recipient acknowledges that Recipient has read and understands the terms and conditions of this Pioneer Hi-Bred Seed and Technology Agreement and that Recipient agrees to be bound by the terms and conditions contained therein.

Signature: Cynthia Nichols
Recipient Printed Name: Cynthia Nichols
Recipient Organization: The University of Tennessee
Recipient Address: 2621 Morgan Circle, 225 Morgan Hall, Knoxville TN 37996
Date: 2/21/2014

After signing, please scan and email to michelle.roberson@pioneer.com or fax to 515-535-3829, Attention: TTL Representative.

® YieldGard and Roundup Ready are registered trademarks used under license from Monsanto Company. Herculex® insect protection technology by Dow AgroSciences and Pioneer Hi-Bred. ®Herculex is a registered trademark of Dow AgroSciences LLC. ®LibertyLink is a registered trademark of Bayer. Agrisure® and Agrisure Viptera® are registered trademarks 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. The DuPont Oval Logo is a registered trademark of DuPont.
®, TM, SM Trademarks and service marks of Pioneer. ©2012, PHII.





Pioneer Hi-Bred International, Inc.
Emerson Building
7250 N.W. 62nd Ave.
P.O. Box 552
Johnston, IA 50131-0552
(515) 535-3200 Tel

February 6, 2014

Subject: Optimum® Leptra™ Product Stewardship Requirements

Dear Researcher,

Your study includes one or more of the following Pioneer® brand products with Optimum® Leptra™ insect protection for the 2014 growing season: P1319VYHR, P1401VYHR, P1637VYHR, P1794VYHR.

All Optimum Leptra products are fully approved in the United States and Canada. Traits included in these products may or may not be approved in some global markets, therefore the combination of these traits and the grain and certain by-products from these products may not be approved for all markets.

This letter is a reminder of DuPont Pioneer's stewardship requirements for Optimum Leptra products. For crops or other material containing Optimum Leptra products, growers must only sell such crops or material to grain handlers that confirm their acceptance or are using crops in such a way that they do not enter the grain channel. There are several ways that growers can meet this stewardship requirement:

- Grain may be used on farm for feed
- Grain may be delivered locally for feed, as long as grain will be delivered directly to the feeding location and will not be exported for any reason
- Grain may be delivered to an elevator or ethanol plant that does not allow grain or by-products to enter the export chain

Included is a copy of our Optimum Leptra product stewardship guide for your reference. Under Pioneer's Technology Use Agreement, Growers who plant Pioneer brand seed with Optimum Leptra agree to adhere to the stewardship requirements outlined in this guide. If you have any questions regarding product stewardship and Pioneer brand Optimum Leptra products, please contact the Pioneer Principal Investigator.

Have a safe and successful harvest season.



2014 Optimum® Leptra™ Product Stewardship Guide

When DuPont Pioneer introduces a new product, we are in it for the long haul.

Our philosophy of product stewardship means responsible management for 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 Pioneer requires that all growers comply with regulations, Pioneer policies, and crop management strategies specific to the product. Growers that plant Pioneer® brand seed with Optimum® Leptra™ insect protection agree to adhere to the stewardship requirements outlined in this guide.

The following Pioneer brand hybrids available for 2014 planting contain Optimum Leptra insect protection:

P1319VYHR

P1401VYHR

P1637VYHR

P1794VYHR

All Optimum Leptra products are fully approved in the United States and Canada. Traits included in these products may or may not be approved in some global markets, therefore the combination of these traits and the grain and certain by-products from THESE PRODUCTS MAY NOT BE APPROVED for all markets.

For crops or other material containing Optimum Leptra products, growers must only sell such crops or material to grain handlers that confirm their acceptance or using such crops or material in such a way that they do not enter the grain channel. There are several ways that growers can meet this stewardship requirement:

- **Grain may be used on farm for feed**
- **Grain may be delivered locally for feed, as long as grain will be delivered directly to the feeding location and will not be exported for any reason**
- **Grain may be delivered to an elevator or ethanol plant that does not allow grain or by-products to enter the export chain**

Customers are advised to discuss trait acceptance policies with their local grain handler prior to delivering grain containing biotech traits.

Crop or Material Handling Stewardship Statement

Pioneer is a member of Excellence Through Stewardship® (ETS). Pioneer products are commercialized in accordance with ETS Product Launch Stewardship Guidance and in compliance with the Pioneer 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. Excellence Through Stewardship® is a registered trademark of the Biotechnology Industry Organization.

Insect Resistance Management Grower Guide (IRM Grower Guide)

Optimum[®] Leptra[™][^] Insect Protection

(HX1, YGCB, AVBL, LL, RR2)

Insect Resistance Management (IRM) Requirements

IMPORTANT: READ PRIOR TO PLANTING



WHAT IS OPTIMUM[®] LEPTRA[™] TECHNOLOGY? Pioneer[®] brand hybrids containing Optimum[®] Leptra[™] Insect Protection provide protection against corn earworm, European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer and sugarcane borer.

NOTE: YOU MUST HAVE A SIGNED PIONEER HI-BRED TECHNOLOGY USE AGREEMENT ON FILE AND AGREE TO ITS TERMS IN ORDER TO USE PIONEER OPTIMUM LEPTRA INSECT PROTECTION HYBRIDS.

REFUGE PERCENTAGE

NON-COTTON GROWING AREAS: On each farm, plant up to 95% of the corn acres with Optimum Leptra 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 Leptra 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 Leptra 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.

DISTANCE REQUIREMENT: Plant the corn borer refuge within, adjacent to, or near the fields that contain Optimum Leptra Insect Protection hybrids. The refuge must be placed within 1/2 mile of Optimum Leptra Insect Protection fields. 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 target 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.

SALES AND PLANTING RESTRICTIONS

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

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

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

PRODUCT USE STATEMENT: This seed contains the Herculex[®] I Insect Protection gene which produces a *Bacillus thuringiensis* (*Bt*) Cry1F protein, the YIELDGARD[®] Corn Borer gene which produces a *Bt* Cry1Ab protein, and the Agrisure Viptera[®] gene which produces a *Vip3Aa20* protein. These proteins provide protection against corn earworm, European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean

cutworm, lesser corn stalk borer, southern corn stalk borer and sugarcane borer. These proteins and the genetic material necessary for their production in corn are registered under EPA Reg. No. 29964-19.

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

^ EXPORT APPROVAL NOTICE: This product is fully approved in the United States and Canada. Traits included in these products may or may not be approved in key global markets; therefore, the combination of these traits and the grain and certain by-products from THESE PRODUCTS MAY NOT BE APPROVED for all markets. For questions about specific countries please contact your Sales Representative or refer to www.pioneer.com/stewardship. Customers are advised to discuss trait acceptance policies with their local grain handler prior to delivering grain containing biotech traits.

PATENT STATEMENT: The Herculex I Insect Resistance technology incorporated into these seeds is protected under U.S. patent numbers: 5,550,318; 6,218,188; 6,573,240; 6,737,273 and 6,943,282. The purchase of these seeds includes a limited license to produce a single corn crop in the United States. 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 under U.S. patent numbers: 5,593,874; 5,859,347; and 6,180,774 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 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 U.S. patent numbers: 5,990,383 and 8,232,456 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, 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.



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[®], the YieldGard Corn Borer Design and Roundup Ready[®] are registered trademarks used under license from Monsanto Company.

Agrisure[®] and Agrisure Viptera[®] are registered trademarks 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.

Liberty[®], LibertyLink[®] and the Water Droplet Design are trademarks of Bayer.

All products are trademarks of their manufacturers.

The DuPont Oval Logo is a registered trademark of DuPont.

PIONEER[®] brand products are provided subject to the terms and conditions of purchase which are part of the labeling and purchase documents. [®], [™], SM Trademarks and service marks of Pioneer. © 2014 PHIL 13-3232A

**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 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.

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 a Grower / 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.

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



Planting Refuges, Preserving Technology

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.

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

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 <http://www.ncga.com/ncga-insect-resistance-management-learning-center>.

Individuals holding a Certified Crop Advisor (CCA) certificate or are a member of the American Society of Farm Managers and Rural Appraisers can earn continuing education unit (CEU) credits by viewing these courses and taking assessments. The American Society of Agronomy ICCA program has granted one (1.0) CCA-CEU in Pest Management for each course. The American Society of Farm Managers and Rural Appraisers (ASFMRA) has granted one (1.0) CEU for each course.

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 Agrisure CB/LL corn acres* (50% in cotton growing areas).	Minimum of 20% of Agrisure RW 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 the refuge plan must meet both the requirements of the corn borer trait(s) and Agrisure RW. (Please refer to the associated trait section for complete refuge requirements.)

** If planting additional seed technologies, follow trait provider refuge requirements.*

Agrisure RW Requirements

Agrisure products containing Agrisure RW (including stack combinations) 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 or her 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 Agrisure RW 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).
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 trait.
 - 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.

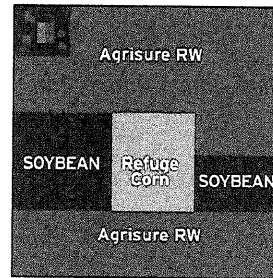
** If planting additional seed technologies, follow trait provider refuge requirements.*

Corn Rootworm Refuge Configurations

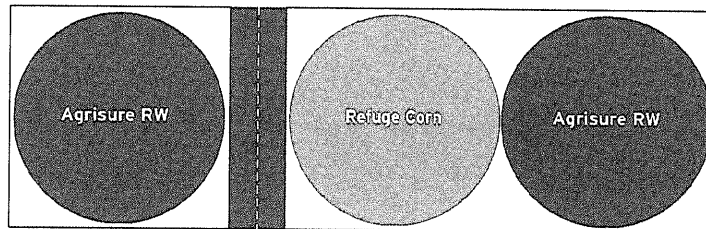
Examples of Refuge Configuration Options

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

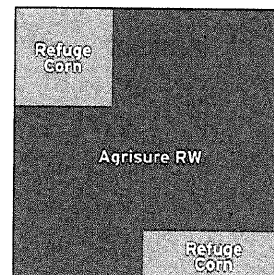


Separated By a Road



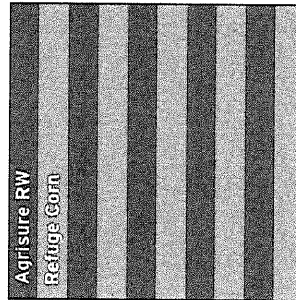
Refuge corn and corn hybrids with Agrisure RW are planted in large blocks in the same field.

Blocks



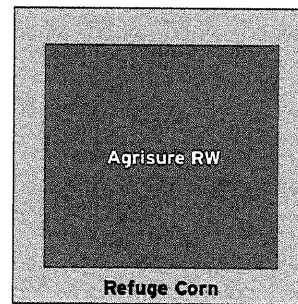
Refuge corn strips must be at least 4 rows (preferably 6 rows) wide.



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

Separate Refuge Planting Requirements

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

- A separate corn rootworm refuge is a field or area of corn that does not contain trait products for controlling rootworm.

Separate Corn Rootworm Refuge

1. A minimum of 20 percent of Agrisure RW 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).
2. Corn rootworm refuge planting options include blocks 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. The corn rootworm refuge corn acres can be treated for corn root-worm 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 RW must be treated in a similar manner.

** If planting additional seed technologies, follow trait provider refuge requirements.*

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.

Please reference NCGA “Know Before You Grow” website for current approval information.

Pollen Movement

Cross pollination is a normal phenomenon in corn production. While most pollen produced by plants in a field remains within or very near that field, it will move into neighboring fields. Because a certain amount of adventitious pollen movement will occur, the achievement of 100% purity of seed or grain in any corn production system is essentially impossible. 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 within a field is more than enough to pollinate the silks of the plants in that field. The high concentration of in-field pollen reduces the chance of cross-pollination from neighboring fields. Furthermore, once pollination has occurred within the field, the silks can no longer receive other pollen grains.
- 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 same span of time.
- Proximity of fields. Studies have shown that most pollen contamination occurs

in fields located downwind within 30 feet from another, with most contamination taking place within the first several rows of the field. To combat this, many white and waxy corn contracts require the grower to remove the outside 12 rows to greatly reduce adventitious pollen contaminated grain.

- 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 over the 5 to 20 days of pollen shed.
- Set-up of given fields. The size and orientation of the neighboring fields influence how they are affected by wind during the pollination period.