

INSECT RESISTANCE MANAGEMENT  
FOR U.S. CORN- AND COTTON-GROWING AREAS



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# WHY PLANT A REFUGE?

Resistance has developed in nature to many pest control tactics. The risk of insect resistance is real, but may be reduced with proper planning.

The best way to preserve the benefits and insect protection of *Bacillus thuringiensis* (*B.t.*) technology is to develop and implement an Insect Resistance Management (IRM) plan.

A key component of any IRM plan is a refuge. A refuge is a block or strip of the same crop that does not contain a *B.t.* technology for controlling targeted insect pests, or the refuge can be included in an EPA approved seed blend product provided by qualified seed producers/conditioners, licensed by Monsanto. The primary purpose of a refuge is to maintain a population of insect pests that are not exposed to *B.t.* proteins. The lack of exposure to *B.t.* proteins allows susceptible insects emerging from the refuge to mate with the rare resistant insects that may emerge from the *B.t.* crop. Susceptibility to *B.t.* technology would then be passed on to their offspring, helping to preserve the long-term effectiveness of *B.t.* technologies. To help reduce the risk of insects developing resistance, the refuge should be planted with a **similar hybrid/variety, as close as possible to, and at the same time as, the crop containing *B.t.* technologies.** With an effective IRM plan in place, growers will continue to benefit from the effective and consistent insect protection and top-yield potential found in crops containing these technologies.

## RETAIN THE RIGHT TO CHOOSE YOUR TECHNOLOGY

The United States Environmental Protection Agency (EPA) mandates a refuge for *B.t.* technology. Insect Resistance Management is a requirement for purchasing and growing insect-protected corn products such as YieldGard VT Rootworm/RR2®, YieldGard® Corn Borer, YieldGard® Corn Borer with Roundup Ready® Corn 2, YieldGard VT Triple®, Genuity® VT Triple PRO®, Genuity® DroughtGard™ Hybrids with VT Triple PRO®, Genuity® VT Double PRO®, Genuity® DroughtGard™ Hybrids with VT Double PRO®, Genuity® SmartStax®, Genuity® SmartStax® RIB Complete® Corn Blend, Genuity® VT Double PRO® RIB Complete® Corn Blend, Genuity® DroughtGard™ Hybrids with VT Double PRO® RIB Complete® Corn Blend, Genuity® VT Triple PRO® RIB Complete® Corn Blend and Genuity® DroughtGard™ Hybrids with VT Triple PRO® RIB Complete® Corn Blend.<sup>1</sup> Insect Resistance Management is also a requirement for purchasing and growing Genuity® Bollgard II® cotton.<sup>2</sup> Continued availability of *B.t.* technologies depends on grower compliance with EPA registration conditions.

## GOOD STEWARDSHIP INCLUDES:

- Reading and signing a Monsanto Technology/Stewardship Agreement (MTSA).
- Complying with all the IRM practices for specific biotech traits as mandated by the EPA, this IRM Grower Guide and the MTSA.
- Complying with any additional stewardship IRM requirements that Monsanto deems appropriate or necessary to implement for proper stewardship or regulatory compliance.
- Using seed containing Monsanto Technologies solely for planting a single commercial crop.
- Selling harvested grain with biotech traits to grain handlers that confirm their acceptance; or using that grain as domestic feed.

## REFUGE REQUIREMENTS

- Plant the refuge at the same time as the *B.t.* technologies.
- Grower mixing of non-*B.t.* seed with *B.t.* technologies is not permitted. However, non-*B.t.* seed can be included in an EPA approved seed blend product, if provided by qualified seed producers/conditioners, licensed by Monsanto.
- To avoid inadvertent mixing of seed in the planting process, be sure to clean all seed out of hoppers when switching from non-*B.t.* seed to traited seed, or vice versa.
- Adjacent and separate refuge fields must be planted and managed by the same grower.
- If *B.t.* corn technologies are planted on rotated ground, then the corn refuge can be planted on either continuous corn ground or on rotated ground.
- If *B.t.* corn technologies are planted on continuous corn ground, then the corn refuge must also be planted on continuous corn ground.

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Growers should monitor their fields and contact their seed dealer or Monsanto at 1-800-768-6387 if performance problems are observed.

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<sup>1</sup>In the Corn-Growing Area only (as shown on page 4), Genuity SmartStax RIB Complete, Genuity VT Double PRO RIB Complete, Genuity DroughtGard Hybrids with VT Double PRO RIB Complete, Genuity VT Triple PRO RIB Complete and Genuity DroughtGard Hybrids with VT Triple PRO RIB Complete do not require a planted, structured refuge, as the refuge seed is included in the seed blend.

<sup>2</sup>In some areas, a natural refuge option is available for Genuity Bollgard II cotton.





### QUESTIONS? WE'RE HERE TO HELP.

Monsanto works to develop and implement IRM programs that strike a balance between available knowledge and practicality, with grower acceptance and implementation of the plan as critical components.

The graphic depictions of refuge configurations in this IRM Grower Guide are offered merely as examples to growers and are not necessarily drawn to scale. As detailed in this Guide, refuge requirements vary by the type of product being planted and the location of planting. Growers must plant the amount of refuge acres for a product that is required for their growing region. Please contact your seed dealer with any questions and/or call 1-800-768-6387.

As a condition of registration of *B.t.* products by the EPA, seed companies are required to conduct IRM compliance assessments during the growing season to ensure grower compliance. Failure to follow IRM guidelines and properly plant a refuge may result in the loss of access to *B.t.* technologies. Please do your part to ensure these technologies are preserved by fully cooperating in refuge management.

If you have questions about seed stewardship or become aware of individuals utilizing biotech traits in a manner other than as noted previously, please call 1-800-768-6387. Letters reporting unauthorized or improper use of biotech traits may be sent to:

Monsanto Stewardship  
800 N. Lindbergh Boulevard E3NA  
St. Louis, MO 63167

Anyone may provide Anonymous or Confidential reports as follows:

**“Anonymous”** reporting occurs when a person reports information to Monsanto in such a way that the identity of the person reporting the information cannot be identified. This kind of reporting includes telephone calls requesting anonymity and unsigned letters.

**“Confidential”** reporting occurs when a person reports information to Monsanto in such a way that the reporting person’s identity is known to Monsanto. Every effort will be made to protect a person’s identity, but it is important to understand that a court may order Monsanto to reveal the identity of people who are “known” to have supplied relevant information.

### INTEGRATED PEST MANAGEMENT

#### Sustainable Agriculture

Monsanto *B.t.* corn and cotton products are highly compatible with the goals of Integrated Pest Management (IPM) and sustainable agriculture. Sustainability of cotton and corn agricultural systems is enhanced when growers follow recommended IPM practices, including cultural and biological control tactics, and appropriate use of pest thresholds and sampling. These latter measures are not only important for non-*B.t.* refuge acres, but are equally important for detecting and controlling non-target pests that exceed established thresholds on *B.t.* crops.

#### Pests Not Controlled

Although *B.t.* cotton will sustain less damage from some of the most troublesome lepidopteran pests, it will not provide control against non-lepidopteran species. Similarly, specific *B.t.* corn products offer control against several of the key lepidopteran and coleopteran insect pests, but will not control all insect pests in corn. Therefore, it is important to understand that, in some cases, severe infestations of target and/or non-target insects may require additional control measures/treatment. Refer to specific products within this guide for further information. **Fields should be scouted regularly, especially during periods of heavy or sustained pest presence.** Consult local IPM monitoring guidelines to identify insects that should be routinely monitored, and for recommended controls and thresholds. When insecticide treatments are required, select products that have the least impact on beneficial insects. Consult your local crop adviser or extension specialist for the most up-to-date information.

#### An IPM Checklist

- Employ appropriate scouting techniques and treatment decisions.
- Select insecticide treatments that have minimal negative impact on beneficial insects; these insects are conserved by *B.t.*-protected crops and can contribute to insect pest control.
- Select cultivars well-adapted to your setting, giving appropriate attention to impact of crop maturity and timing of harvest on pest severity.
- Use recommended cultural control methods to reduce pest overwintering; destroy crop promptly after harvest and use other soil management practices to reduce overwintering insects.

# CORN REFUGE REQUIREMENTS




## STRUCTURED REFUGE TYPES

-  Trait
-  Common Refuge
-  Above Ground Refuge
-  Below Ground Refuge

The refuge configurations depicted here are offered merely as examples to growers and are not necessarily to scale. As detailed in this IRM Grower Guide, refuge requirements vary by the type of product being planted and the location of planting. Growers must plant the amount of refuge acres for a product that is required for their growing area. Please contact your seed dealer with any questions and/or call 1-800-768-6387.


**SINGLE TRAIT**

**1. SINGLE-PEST REFUGE (For Rootworm OR Corn Borer)**  
 A single-pest refuge is a single field that serves solely as a refuge for above ground pests (e.g., corn borer), or below ground pests (e.g., corn rootworm), **but not both**. Each single-trait product requires its **own** individual refuge.

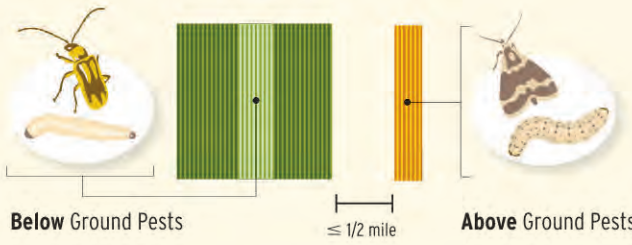


**STACKED TRAITS**

**2. COMMON REFUGE (For Rootworm AND Corn Borer)**  
 A common refuge is a single field that serves as a refuge for both above ground pests (e.g., corn borer) and below ground pests (e.g., corn rootworm) at the same time.



**3. SEPARATE REFUGES (For Rootworm AND Corn Borer)**  
 A separate refuge is an option that requires two fields—one field which is adjacent to or within your *B.t.* field that serves as a refuge for below ground pests (e.g., corn rootworm) and a separate field (up to 1/2 mile away) that serves as a refuge for above ground pests (e.g., corn borer).





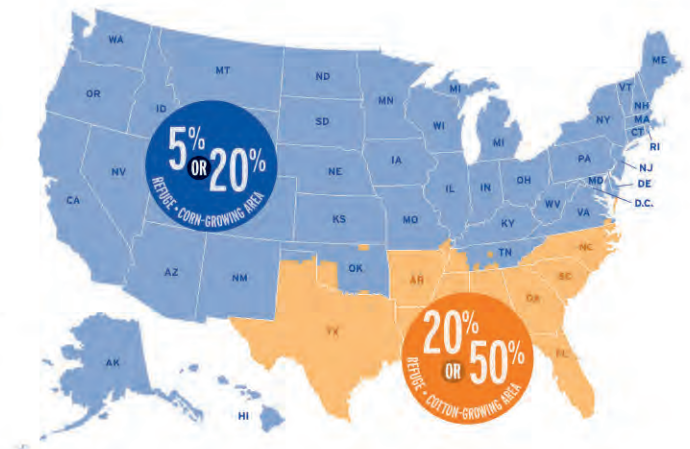
# CORN REFUGE REQUIREMENTS



## STRUCTURED REFUGE

Insect Resistance Management (IRM) requirements vary depending upon the crop you are growing, and the growing area where you are planting the seed.

For corn, use this map to determine your growing area. If you have any questions regarding the IRM requirements for your growing area, you may call 1-800-768-6387 for further information.



To help increase understanding of refuge requirements, Monsanto has developed a bag tag labeling system for its corn products:



The following states and counties are within the **Corn-Growing Area**. The blue circle refuge requirements apply to corn products grown in this area.

- |             |  |  |   |               |
|-------------|--|--|---|---------------|
| Alaska      | Massachusetts  | Oklahoma—all counties except Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman & Washita   | Texas—only the counties of Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts & Sherman                   | Washington    |
| Arizona     | Michigan   | Oregon   | Utah  | West Virginia |
| California  | Minnesota  | Pennsylvania   | Vermont   | Wisconsin     |
| Colorado    | Missouri—all counties except Dunklin, New Madrid, Pemiscot, Scott & Stoddard | Rhode Island   | Virginia—all counties except Dinwiddie, Franklin City, Greenville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey & Sussex | Wyoming       |
| Connecticut | Montana  | South Dakota   |   |               |
| Delaware    | Nebraska   | Tennessee—all counties except Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby & Tipton |   |               |
| Hawaii      | Nevada   |  |   |               |
| Idaho       | New Hampshire  |  |   |               |
| Illinois    | New Jersey   |  |   |               |
| Indiana     | New Mexico   |  |   |               |
| Iowa        | New York   |  |   |               |
| Kansas      | North Dakota   |  |   |               |
| Kentucky    | Ohio   |  |   |               |
| Maine       |  |  |   |               |
| Maryland    |  |  |   |               |



The following states and counties are within the **Cotton-Growing Area**. The orange circle refuge requirements apply to corn products grown in this area.

- |             |   |   |   |  |  |
|-------------|---|---|---|--|--|
| Alabama     | Missouri—only the counties of Dunklin, New Madrid, Pemiscot, Scott & Stoddard | Oklahoma—only the counties of Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman & Washita | Tennessee—only the counties of Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby & Tipton | Texas—all counties except Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts & Sherman | Virginia—only the counties of Dinwiddie, Franklin City, Greenville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey & Sussex |
| Arkansas    | North Carolina  | South Carolina  |   |  |  |
| Florida     |   |   |   |  |  |
| Georgia     |   |   |   |  |  |
| Louisiana   |   |   |   |  |  |
| Mississippi |   |   |   |  |  |



Genuity® SmartStax®, Genuity® VT Double PRO® and Genuity® DroughtGard™ Hybrids with VT Double PRO® are not approved for sale or planting in Maine.

Genuity® VT Triple PRO® RIB Complete® Corn Blend and Genuity® DroughtGard™ Hybrids with VT Triple PRO® RIB Complete® Corn Blend may not yet be registered in all states. Check with your Monsanto representative for the registration status in your state.

Genuity® SmartStax® RIB Complete® Corn Blend, Genuity® VT Double PRO® RIB Complete® Corn Blend, Genuity® DroughtGard™ Hybrids with VT Double PRO® RIB Complete® Corn Blend, Genuity® VT Triple PRO® RIB Complete® and Genuity® DroughtGard™ Hybrids with VT Triple PRO® RIB Complete® require a 20% planted, structured refuge in the Cotton-Growing Area.



# Genuity® SmartStax® RIB Complete® Corn Blend, Genuity® VT Double PRO® RIB Complete® Corn Blend, Genuity® DroughtGard™ Hybrids with VT Double PRO® RIB Complete® Corn Blend



**Genuity® SmartStax® RIB Complete® Corn Blend** contains Cry1A.105, Cry2Ab2, Cry1F, Cry3Bb1, Cry34Ab1 and Cry35Ab1 from *Bacillus thuringiensis* (B.t.) that together control European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, stalk borer, lesser corn stalk borer, sugarcane borer, western bean cutworm, black cutworm, western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Routine applications of insecticides to control these insects are usually unnecessary when corn containing Genuity SmartStax RIB Complete is planted. This hybrid also contains Roundup Ready® 2 Technology and LibertyLink® technology that provide tolerance to in-crop applications of labeled Roundup® agricultural herbicides and Ignite® herbicides, respectively, when applied according to label directions.

**Genuity® VT Double PRO® RIB Complete® Corn Blend** contains Cry1A.105 and Cry2Ab2 from *Bacillus thuringiensis* (B.t.) that together control European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, corn earworm, corn stalk borer, and fall armyworm. This product also contains Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled Roundup® agricultural herbicides when applied according to label directions.

**Genuity® DroughtGard™ Hybrids with VT Double PRO® RIB Complete® Corn Blend** have the same IRM requirements as Genuity VT Double PRO RIB Complete.

Genuity SmartStax RIB Complete corn blend and Genuity VT Double PRO RIB Complete corn blend include a refuge that is interspersed within the field by planting a licensed seed-mixture containing 95% Genuity SmartStax or Genuity VT Double PRO mixed with a minimum of 5% non-*B.t.* seed within a single lot of seed. This product satisfies the refuge requirements in all regions other than in the Cotton-Growing Area as defined herein. Routine applications of insecticides to control the insects mentioned in the product description are usually unnecessary when corn containing *B.t.* proteins is planted.

## In the Corn-Growing Area

There are no requirements for a separate structured refuge for Genuity SmartStax RIB Complete and Genuity VT Double PRO RIB Complete corn when planted in the U.S. Corn-Growing Area. The refuge seed of Genuity SmartStax RIB Complete and Genuity VT Double PRO RIB Complete corn is contained in the bag resulting in a refuge configuration that is interspersed within the field. The interspersed refuge can only be used by planting seed corn specifically generated by qualified seed producers/conditioners licensed by Monsanto. The seed producers/conditioners licensed by Monsanto must ensure a minimum of 5% non-*B.t.* refuge seed is included with the Genuity SmartStax and Genuity VT Double PRO seed in each lot of seed corn.

**Genuity SmartStax RIB Complete:** The refuge seed in the seed mixture may not be treated with seed-applied insecticides for corn rootworm control unless the Genuity SmartStax seed in the seed mixture receives the same treatment. Insecticidal treatments labeled for adult corn rootworm control are discouraged during the time of adult corn rootworm emergence.

**Genuity VT Double PRO RIB Complete:** The field may be treated with labeled insecticides to control additional corn pests, including larval or adult lepidopteran pests.

## In the Cotton-Growing Area

Genuity SmartStax RIB Complete and Genuity VT Double PRO RIB Complete seed require the planting of an additional 20% structured refuge (i.e., 20 acres of non-*B.t.* corn for every 80 acres of Genuity RIB Complete corn planted, for a total of 100 acres). The 20% refuge must be planted with corn hybrids that do not contain *B.t.* technologies.

**Treatment (Cotton-Growing Area)**—Insecticide treatments for control of the target pests mentioned in the product description above may be applied only if pest pressure reaches an economic threshold for damage. Sprayable *B.t.* insecticides must not be applied.

**Refuge Planting (Cotton-Growing Area)**—The refuge and the Genuity SmartStax RIB Complete or Genuity VT Double PRO RIB Complete seed should be planted on the same day, or with the shortest window possible between planting dates to help ensure that corn root development is similar among hybrids. The structured refuge may be planted as an in-field or adjacent (e.g., across the road) refuge, or as a separate block that is within 1/2 mile of the Genuity SmartStax RIB Complete or Genuity VT Double PRO RIB Complete field. In-field refuge options include blocks, perimeter strips (i.e., strips around the field), or in-field strips. If perimeter or in-field strips are implemented, the strips must be at least 4 contiguous rows wide. The 20% structured refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides if the population of one or more target lepidopteran pests of Genuity SmartStax RIB Complete or Genuity VT Double PRO RIB Complete in the refuge exceeds economic thresholds. In addition, the 20% structured refuge can be protected from corn rootworm damage by an appropriate seed treatment or soil insecticide; however, insecticides labeled for adult corn rootworm control must be avoided in the refuge during the period of corn rootworm adult emergence. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., extension service agents, crop consultants).

The Cotton-Growing Area requiring the additional 20% refuge consists of the states and counties shown on page 4.





# Genuity® VT Triple PRO® RIB Complete® Corn Blend and Genuity® DroughtGard™ Hybrids with VT Triple PRO® RIB Complete® Corn Blend



Genuity® VT Triple PRO® RIB Complete® Corn Blend contains Cry1A.105, Cry2Ab2 and Cry3Bb1 from *Bacillus thuringiensis* (*B.t.*) that together control European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, corn earworm, fall armyworm, corn stalk borer, western corn rootworm, northern corn rootworm, and Mexican corn rootworm. This hybrid also contains Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled Roundup® agricultural herbicides when applied according to label directions.

Genuity® DroughtGard Hybrids™ with VT Triple PRO® RIB Complete® Corn Blend have the same IRM requirements as Genuity VT Triple PRO RIB Complete.

Genuity VT Triple PRO RIB Complete corn blend includes refuge that is interspersed within the field by planting a licensed seed-mixture containing 90% Genuity VT Triple PRO mixed with a minimum of 10% non-*B.t.* seed within a single lot of seed. This product satisfies the refuge requirements in all areas other than in the Cotton-Growing Area as defined herein.

## In the Corn-Growing Area

There are no requirements for a separate structured refuge for Genuity VT Triple PRO RIB Complete when planted in the U.S. Corn-Growing Area. The refuge seed of Genuity VT Triple PRO RIB Complete corn is contained in the bag, resulting in a refuge configuration that is interspersed within the field. The interspersed refuge can only be used by planting seed corn specifically generated by qualified seed producers/conditioners licensed by Monsanto. The seed producers/conditioners licensed by Monsanto must ensure a minimum of 10% non-*B.t.* refuge seed is included with the Genuity VT Triple PRO seed in each lot of seed corn. The refuge seed in the seed mixture may not be treated with seed-applied insecticides for corn rootworm control unless the Genuity VT Triple PRO seed in the seed mixture receives an equivalent seed treatment for corn rootworm control.

## In the Cotton-Growing Area

Genuity VT Triple PRO RIB Complete requires the planting of an additional 20% structured refuge (i.e., 20 acres of non-*B.t.* corn for every 80 acres of Genuity VT Triple PRO RIB Complete planted).

The refuge and the Genuity VT Triple PRO RIB Complete seed should be planted on the same day or with the shortest window possible between planting dates to help ensure that corn root development is similar among hybrids.

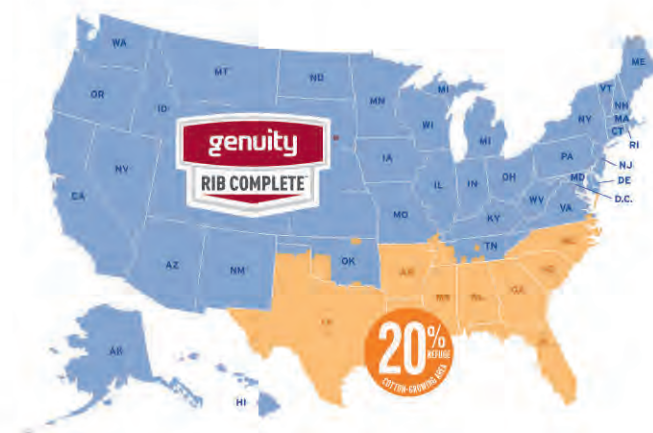
The 20% refuge must be planted with corn hybrids that do not contain *B.t.* technologies. The structured refuge may be planted as an in-field or adjacent (e.g., across the road) refuge. In-field refuge options include blocks, perimeter strips (i.e., strips around the field), or in-field strips. Monsanto does not recommend a separate 1/2 mile refuge option for Genuity VT Triple PRO RIB Complete.

If perimeter or in-field strips are implemented, the strips must be a minimum of 4 contiguous rows wide. The 20% structured refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides

if the population of one or more target pests of Genuity VT Triple PRO RIB Complete in the refuge exceeds economic thresholds. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., Extension Service agents, crop consultants). In addition, refuge can be protected from corn rootworm damage by appropriate seed treatment or soil insecticide.

The Cotton-Growing Area requiring the additional 20% refuge consists of the following states (see map below):

Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Missouri (only the counties of Dunklin, New Madrid, Pemiscot, Scott, and Stoddard), North Carolina, Oklahoma (only the counties of Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman, and Washita), South Carolina, Tennessee (only the counties of Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby, and Tipton), Texas (except the counties of Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts, and Sherman), and Virginia (only the counties of Dinwiddie, Franklin City, Greenville, Isle of Wight, Northampton, Southampton, Suffolk City, Surrey, and Sussex).



Genuity VT Triple PRO RIB Complete may not yet be registered in all states. Check with your Monsanto representative for the registration status in your state.





*This hybrid contains Cry1A.105, Cry2Ab2, Cry1F, Cry3Bb1, Cry34Ab1 and Cry35Ab1 from B.t. that together control European corn borer, southwestern corn borer, southern cornstalk borer, corn earworm, fall armyworm, stalk borer, lesser corn stalk borer, sugarcane borer, western bean cutworm, black cutworm, western corn rootworm, northern corn rootworm, and Mexican corn rootworm. Routine applications of insecticides to control these insects are usually unnecessary when corn containing Genuity® SmartStax® is planted. This hybrid also contains Roundup Ready® 2 Technology and LibertyLink® technology that provide tolerance to in-crop applications of labeled Roundup® agricultural herbicides and Ignite® herbicides, respectively, when applied according to label directions.*

**REFUGE TARGET**

Planting a non-*B.t.* common refuge provides convenience by combining the corn borer and corn rootworm refuges into one effective insect refuge. Planting a common refuge also meets the distance requirement to ensure compliance.

**% NON-*B.T.* REFUGE**

**5%** **Corn-Growing Area:** The refuge area must represent at least 5% of the grower’s corn acres (i.e., 5 acres of non-*B.t.* corn for every 95 acres of Genuity® SmartStax® planted, for a total of 100 acres).

**20%** **Cotton-Growing Area:** The refuge area must represent at least 20% of the grower’s corn acres (i.e., 20 acres of non-*B.t.* corn for every 80 acres of Genuity SmartStax planted, for a total of 100 acres).

**REFUGE PLANTING**

The common refuge must be planted with corn hybrids that do not contain *B.t.* technologies. The refuge can be planted with Roundup Ready® Corn 2 or conventional corn. Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot. The corn refuge and Genuity SmartStax corn should be sown on the same day or with the shortest window possible between planting dates to help ensure that corn development is similar among hybrids. If the Genuity SmartStax corn is planted on rotated ground, then the corn refuge can be planted on either continuous corn ground or on rotated ground. If the Genuity SmartStax corn is planted on continuous corn ground, then the corn refuge must also be planted on continuous corn ground.

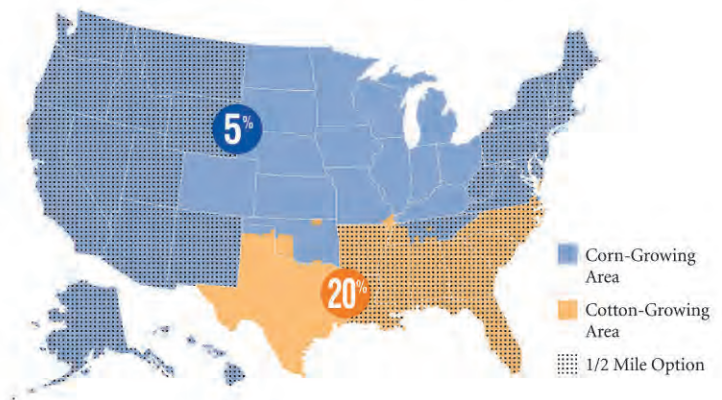
Ensure each *B.t.*-containing product has its own designated refuge.  
**A refuge for Genuity SmartStax corn cannot function as the refuge for another *B.t.* technology.**

**REFUGE LOCATION**

The common refuge can be within or adjacent to the Genuity SmartStax field. If adjacent, it can be separated by a road, path, ditch, etc., but not by another field.

Monsanto recommends planting the corn refuge for Genuity SmartStax as an in-field or adjacent refuge as explained in this IRM Grower Guide. However, if corn rootworms are not significant within a region, the common refuge may also be planted as a separate block that is within 1/2 mile of the Genuity SmartStax field.

This additional option to plant the refuge as a block within 1/2 mile is only available to growers in the following States: AK, AL, AR, AZ, CA, CT, DE, FL, GA, HI, ID, LA, MA, MD, ME, MS, MT, NC, NH, NJ, NM, NV, NY, OR, PA, RI, SC, TN, UT, VA, VT, WA, WV, WY.



**REFUGE CONFIGURATION OPTIONS**

The common refuge must be planted as an in-field or adjacent refuge. It can be planted as a block within or adjacent (e.g., across the road) to the Genuity SmartStax field, perimeter strips (i.e., strips around the field), or in-field strips. Growers should calculate the acres required for refuge and plant the appropriate amount of refuge seed for the configuration option selected. For example, if in the 5% refuge area and choosing to plant in-field strips, calculate how much refuge seed is needed to meet the 5% minimum requirement and fill the refuge planter boxes with that amount. Plant the strips until the 5% minimum refuge seed is completed. Then fill the planter boxes with Genuity SmartStax seed and continue planting the rest of the field.

**SIZE**

If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.

**TREATMENT (follow all pesticide label directions)**

Under typical growing conditions for planted Genuity SmartStax, routine applications of insecticides to control pests are usually unnecessary. However, the common refuge can be protected from lepidopteran damage by use of non-*B.t.* insecticides if the population of one or more target lepidopteran pests in the refuge exceeds economic thresholds. The refuge can also be protected from corn rootworm damage by an appropriate seed treatment or soil insecticide; but insecticides labeled for adult corn rootworm control must be

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avoided in the refuge during the period of corn rootworm adult emergence. Economic thresholds will be determined using methods recommended by local or regional professionals (e.g., extension service agents and crop consultants).

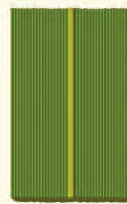
Genuity® SmartStax® contains Roundup Ready® 2 Technology and LibertyLink® herbicide tolerance traits, but your refuge may or may not. Select an appropriate herbicide for your refuge before spraying the refuge, to avoid crop damage.

## 5% REFUGE CONFIGURATIONS

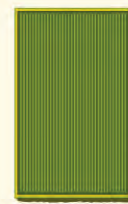
### CORN-GROWING AREA

-  Genuity SmartStax
-  Common Refuge (i.e., Roundup Ready Corn 2 or conventional corn)
-  Designates road, ditch, path, etc.

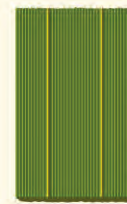
#### Within



Block

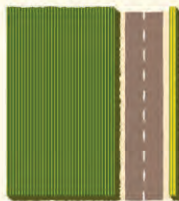


Perimeter

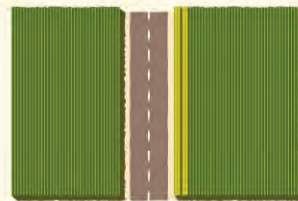


Strips

#### OR Adjacent



Adjacent



Within adjacent field

#### OR 1/2 Mile Option






← ≤ 1/2 mile →

1/2 mile option available in limited areas — see page 7 for details.

## 20% REFUGE CONFIGURATIONS

### COTTON-GROWING AREA

-  Genuity SmartStax
-  Common Refuge (i.e., Roundup Ready Corn 2 or conventional corn)
-  Designates road, ditch, path, etc.

#### Within



Block

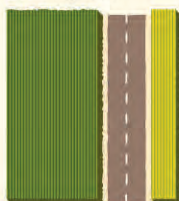


Perimeter



Strips

#### OR Adjacent



Adjacent



Within adjacent field

#### OR 1/2 Mile Option



← ≤ 1/2 mile →

1/2 mile option available in limited areas — see page 7 for details.



# Genuity® VT Triple PRO® Genuity® DroughtGard™ Hybrids with VT Triple PRO®



Genuity® VT Triple PRO® contains Cry1A.105, Cry2Ab2 and Cry3Bb1 from *B.t.* that together control European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, corn earworm, fall armyworm, corn stalk borer, western corn rootworm, northern corn rootworm, and Mexican corn rootworm. This hybrid also contains Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled Roundup® agricultural herbicides when applied according to label directions.

Genuity® DroughtGard™ Hybrids with VT Triple PRO® have the same IRM requirements as Genuity VT Triple PRO.

## REFUGE TARGET

Serves as a refuge for both corn borer and corn rootworm. The common refuge offers convenience by combining the corn borer and corn rootworm refuges into one effective corn refuge.

## % NON-*B. T.* REFUGE

**20% 20% Both Corn- and Cotton-Growing Areas:** The refuge area must represent at least 20% of the grower's corn acres (i.e., 20 acres of non-*B.t.* corn for every 80 acres of Genuity VT Triple PRO for a total of 100 acres).

## REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain *B.t.* technologies. The refuge can be planted with Roundup Ready® Corn 2 or with conventional corn. Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.

## REFUGE LOCATION

The refuge can be within or adjacent to the Genuity VT Triple PRO field. If adjacent, it can be separated by a road, path, ditch, etc., but not by another field. If you have questions, please contact Monsanto at 1-800-768-6387.

## REFUGE CONFIGURATION OPTIONS

The refuge can be planted as a block, strips within the field or as a perimeter around the field.

## SIZE

If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.




## TREATMENT (follow all pesticide label directions)

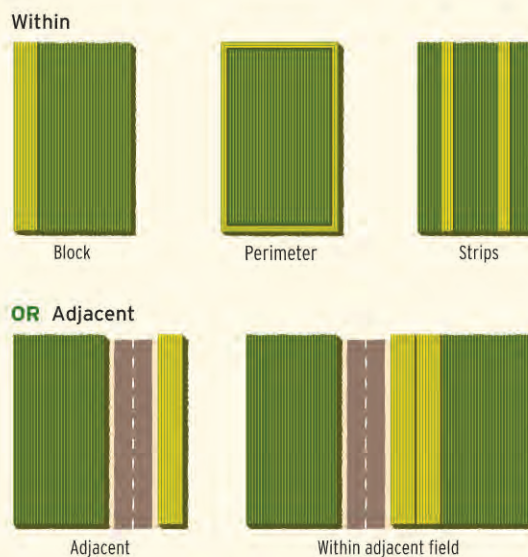
The common refuge can be treated with a soil-applied, seed-applied or foliar-applied insecticide to control rootworm larvae and other soil pests.

The refuge can also be treated with a non-*B.t.* foliar-applied insecticide for control of late-season pests (i.e., corn borer), if pest pressure reaches an economic threshold for damage. However, if rootworm adults are present at the time of foliar application, then the Genuity VT Triple PRO field must be treated in a similar manner.

## COMMON REFUGE CONFIGURATIONS

Plant at least the minimum required 20% non-*B.t.* common (corn rootworm and corn borer) refuge **within or adjacent to** each Genuity VT Triple PRO corn field. Can be separated by a road, path, ditch, etc., but not by another field. Monsanto does not recommend a separate 1/2 mile refuge option for Genuity VT Triple PRO.

-  Genuity VT Triple PRO
-  Common Refuge (i.e., Roundup Ready Corn 2 or conventional corn)
-  Designates road, ditch, path, etc.





# Genuity® VT Double PRO®, Genuity® DroughtGard™ Hybrids with VT Double PRO®, YieldGard® Corn Borer, YieldGard® Corn Borer with Roundup Ready® Corn 2



Genuity® VT Double PRO® contains Cry1A.105 and Cry2Ab2 from *B.t.* that together control European corn borer, southwestern corn borer, sugarcane borer, southern cornstalk borer, corn earworm, corn stalk borer, and fall armyworm. This hybrid also contains Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled Roundup® agricultural herbicides when applied according to label directions.

Genuity® DroughtGard™ Hybrids with VT Double PRO® have the same IRM requirements as Genuity VT Double PRO.

YieldGard® Corn Borer contains Cry1Ab from *B.t.* which controls European corn borer, southwestern corn borer and sugarcane borer. YieldGard Corn Borer with Roundup Ready Corn 2 contains the Roundup Ready Corn 2 trait (NK603) that provides tolerance to in-crop applications of labeled Roundup agricultural herbicides when applied according to label directions.

## REFUGE TARGET

Serves as a refuge for European corn borer, southwestern corn borer and sugarcane borer. The refuge on each farm may be arranged in a number of configurations, offering the flexibility to easily incorporate an effective corn refuge into any farm operation.

## % NON-B.T. REFUGE

The refuge area must represent the following % of the grower's total corn acres (products shown above plus refuge acres equals total corn acres):

	Genuity VT Double PRO	YieldGard Corn Borer or YieldGard Corn Borer with Roundup Ready Corn 2
Corn-Growing Area	5%	20%
Cotton-Growing Area	20%	50%

## REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain *B.t.* technologies. The refuge can be planted with Roundup Ready® Corn 2 or with conventional corn. Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.

## REFUGE LOCATION

The refuge can be within, adjacent to or within 1/2 mile from the Genuity VT Double PRO, YieldGard Corn Borer or YieldGard Corn Borer with Roundup Ready Corn 2 field.

## REFUGE CONFIGURATION OPTIONS

Refuge can be planted as a block, strips within the field, a perimeter around the field or a separate block within 1/2 mile of the *B.t.* field.

## SIZE





If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.

## TREATMENT (follow all pesticide label directions)

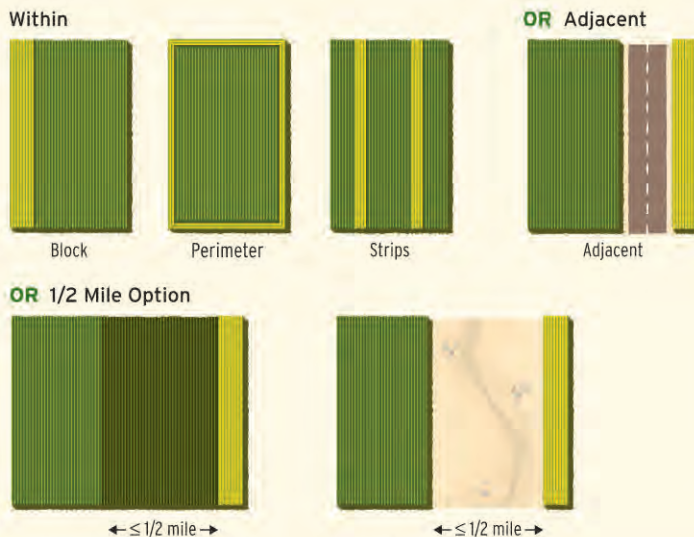
The refuge can be treated with a non-*B.t.* foliar-applied insecticide for control of late-season pests (i.e., corn borer), if pest pressure reaches an economic threshold for damage. Sprayable *B.t.* insecticides must not be applied to the refuge corn.

## REFUGE CONFIGURATIONS

Plant at least the minimum required\* non-*B.t.* refuge **within, adjacent to or as a separate block within 1/2 mile** of each *B.t.* corn field.

-  Genuity VT Double PRO, YieldGard Corn Borer, or YieldGard Corn Borer with Roundup Ready Corn 2
-  Soybeans
-  Refuge (i.e., Roundup Ready Corn 2 or conventional corn)
-  Designates road, ditch, path, etc.

\*For Genuity VT Double PRO, the minimum refuge is 5% in the Corn-Growing Area and 20% in the Cotton-Growing Area. For YieldGard Corn Borer or YieldGard Corn Borer with Roundup Ready Corn 2, the minimum refuge is 20% in the Corn-Growing Area and 50% in the Cotton-Growing Area.



As an example, the images above represent 20% refuge requirements.





## COMMON REFUGE OPTION

See **SEPARATE REFUGE OPTION** on page 12.

YieldGard VT Triple® contains Cry1Ab and Cry3Bb1 from B.t. that together control European corn borer, southwestern corn borer and sugarcane borer as well as excellent protection against western corn rootworm, northern corn rootworm, and Mexican corn rootworm. This hybrid also contains Roundup Ready® 2 Technology that provides tolerance to in-crop applications of labeled Roundup® agricultural herbicides when applied according to label directions.

### REFUGE TARGET

Serves as a refuge for both corn borer and corn rootworm. The common refuge option offers flexibility by combining the corn borer and corn rootworm refuges into one effective corn refuge.

### % NON-B.T. REFUGE

**20%** **Corn-Growing Area:** The refuge area must represent at least 20% of the grower's corn acres (i.e., 20 acres of non-B.t. corn for every 80 acres of YieldGard VT Triple, for a total of 100 acres).

**50%** **Cotton-Growing Area:** The refuge area must represent at least 50% of the grower's corn acres (i.e., 50 acres of non-B.t. corn for every 50 acres of YieldGard VT Triple, for a total of 100 acres).

### REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain B.t. technologies. The refuge can be planted with Roundup Ready® Corn 2 or with conventional corn. Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.

### REFUGE LOCATION

The refuge can be within or adjacent to the B.t. field. If adjacent, it can be separated by a road, path, ditch, etc., but not by another field.

### REFUGE CONFIGURATION OPTIONS

Refuge can be planted as a block, strips within the field or as a perimeter around the field.

### SIZE

If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.




### TREATMENT (follow all pesticide label directions)

The common refuge can be treated with a soil-applied, seed-applied or foliar-applied insecticide to control rootworm larvae and other soil pests.

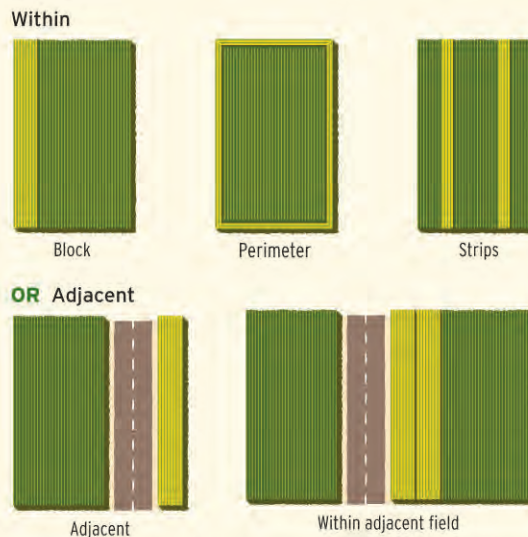
The refuge can also be treated with a non-B.t. foliar insecticide for control of late-season pests (i.e., corn borer), if pest pressure reaches an economic threshold for damage. However, if rootworm adults are present at the time of foliar application, then the B.t. field must be treated in a similar manner.

## COMMON REFUGE CONFIGURATIONS

Plant at least the minimum required\* non-B.t. common (corn rootworm and corn borer) refuge **within or adjacent to** each B.t. corn field. Can be separated by a road, path, ditch, etc., but not by another field.

-  YieldGard VT Triple®
-  Refuge (i.e., Roundup Ready Corn 2 or conventional corn)
-  Designates road, ditch, path, etc.

\*Minimum refuge for YieldGard VT Triple is 20% in the Corn-Growing Area and 50% in the Cotton-Growing Area.



As an example, the images above represent 20% refuge requirements.



## SEPARATE REFUGE OPTION – Requires 2 Separate Fields

### Field 1: Refuge Target—CORN ROOTWORM

Adjacent or within, serves as a refuge for corn rootworm.

# AND

### Field 2: Refuge Target—CORN BORER

Planted separately within 1/2 mile, serves as a refuge for corn borer.

#### % NON-B.T. REFUGE

**20%** **20%** **Both Corn- and Cotton-Growing Areas:** The corn rootworm refuge area must represent at least 20% of the grower's corn acres (i.e., 20 acres of corn rootworm refuge for every 80 acres of YieldGard VT Triple®).

#### REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain *B.t.* technology for control of western, northern and Mexican corn rootworm. The refuge can be planted with *B.t.* hybrids that control corn borer, such as Genuity® VT Double PRO® and YieldGard® Corn Borer protected hybrids. Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.

#### REFUGE LOCATION

The corn rootworm refuge must be within or adjacent to the *B.t.* field. If adjacent, it can be separated by a road, path, ditch, etc., but not by another field.

#### SIZE

If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.

#### TREATMENT (follow all pesticide label directions)

The corn rootworm refuge can be treated with a soil-applied, seed-applied or foliar-applied insecticide to control rootworm larvae and other soil pests.

Since a separate refuge allows Genuity VT Double PRO or YieldGard Corn Borer protected hybrids as the corn rootworm refuge, it is unlikely that late-season foliar insecticide applications will be required for other insect pests. However, if late-season foliar insecticide applications are necessary for control of other corn insect pests that have reached economic threshold, and if rootworm adults are present at the time of application, then the *B.t.* field must be treated in a similar manner.

#### % NON-B.T. REFUGE

**20%** **Corn-Growing Area:** The corn borer refuge area must represent at least 20% of the grower's total corn acres (i.e., 20 acres of corn borer refuge corn for every 80 acres of YieldGard VT Triple, YieldGard Corn Borer with Roundup Ready® Corn 2, and YieldGard Corn Borer, plus refuge acres).

**50%** **Cotton-Growing Area:** The corn borer refuge area must represent at least 50% of the grower's total corn acres (YieldGard VT Triple, YieldGard Corn Borer with Roundup Ready Corn 2, and YieldGard Corn Borer, plus refuge acres).

#### REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain *B.t.* technology for control of above or below ground insect pests (i.e., Roundup Ready Corn 2 or conventional corn). Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.

#### REFUGE LOCATION

Plant a corn borer refuge within 1/2 mile of each YieldGard VT Triple corn field.

#### SIZE

If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.

#### TREATMENT (follow all pesticide label directions)




The corn borer refuge can be treated with a soil-applied, seed-applied or foliar-applied insecticide to control corn rootworm larvae and other soil pests, or a non-*B.t.* foliar-applied insecticide for corn borer control if pest pressure reaches an economic threshold.

## SEPARATE REFUGE CONFIGURATIONS

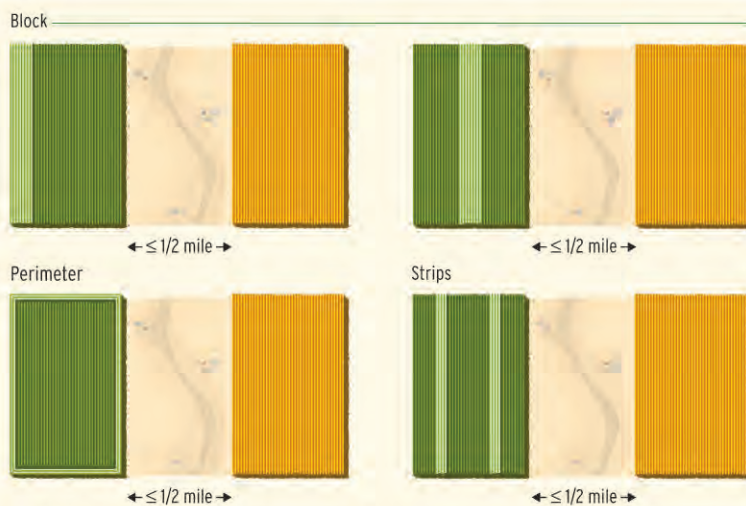
**CORN ROOTWORM** Plant at least the minimum required 20% corn rootworm refuge within or adjacent to the YieldGard VT Triple corn field.

AND

**CORN BORER** Plant at least the minimum required\* non-*B.t.* corn borer refuge within 1/2 mile of each *B.t.* corn field.

-  YieldGard VT Triple
-  Corn Rootworm Refuge (i.e., Genuity VT Double PRO or YieldGard Corn Borer protected hybrids)
-  Corn Borer Refuge (i.e., Roundup Ready Corn 2 or conventional corn)

\*Minimum refuge for YieldGard VT Triple is 20% in the Corn-Growing Area and 50% in the Cotton-Growing Area.



As an example, the images above represent the refuge requirements for the Cotton-Growing Area.





This hybrid contains the active ingredient Cry3Bb1 from *B.t.* which provides effective and consistent protection against western corn rootworm, northern corn rootworm, and Mexican corn rootworm. This hybrid contains Roundup Ready® 2 Technology that provides crop safety for in-crop applications of labeled Roundup® agricultural herbicides when applied according to label directions.

### REFUGE TARGET

Serves as a refuge for western, northern and Mexican corn rootworm. The refuge on each farm may be arranged in a number of configurations, offering the flexibility to easily incorporate an effective corn refuge into the farm operation.

### % NON-*B.t.* REFUGE

**20% 20%** **Both Corn- and Cotton-Growing Areas:** The refuge area must represent at least 20% of the grower's corn acres (i.e., 20 acres of non-*B.t.* corn for every 80 acres of YieldGard VT Rootworm/RR2®, for a total of 100 acres).

### REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain *B.t.* technologies for corn rootworm management. Popcorn can be used as a refuge option, but sweet corn and/or silage corn cannot.

### REFUGE LOCATION

The refuge can be within or adjacent to the *B.t.* field. If adjacent, it can be separated by a road, path, ditch, etc., but not by another field.

### REFUGE CONFIGURATION OPTIONS

The refuge can be planted as a block, strips within the field or as a perimeter around the field.

### SIZE

If perimeter or strips are used for the refuge, they must be at least 4 (four) contiguous rows wide.




### TREATMENT (follow all pesticide label directions)

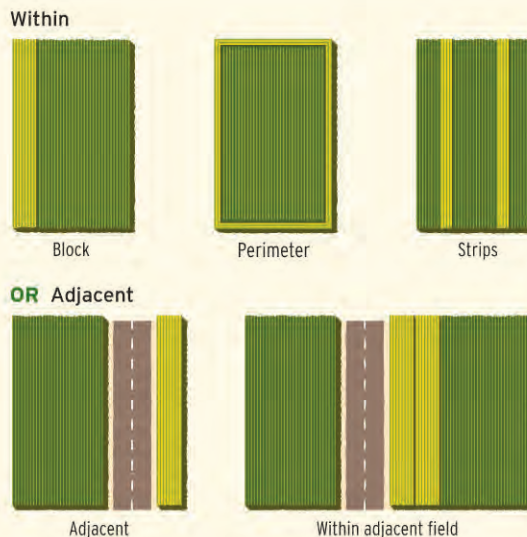
The refuge can be treated with a soil-applied, seed-applied or foliar-applied insecticide to control rootworm larvae and other soil pests.

The refuge can also be treated with a non-*B.t.* foliar insecticide for control of late-season pests (i.e., corn borer), if pest pressure reaches an economic threshold for damage. However, if rootworm adults are present at the time of foliar application, then the *B.t.* field must be treated in a similar manner.

## REFUGE CONFIGURATIONS

Plant at least the minimum required 20% corn rootworm refuge **within or adjacent to** each YieldGard VT Rootworm/RR2® field. Can be separated by a road, path, ditch, etc., but not by another field.

-  YieldGard VT Rootworm/RR2
-  Refuge (i.e., Genuity® VT Double PRO®, YieldGard® Corn Borer protected hybrids, Roundup Ready Corn 2 or conventional corn)
-  Designates road, ditch, path, etc.











## EMBEDDED REFUGE

### SIZE

Monsanto recommends that embedded block refuges be at least 150 feet wide.

### REFUGE LOCATION

The corresponding refuge must be within 1/2 mile.

### REFUGE CONFIGURATION OPTIONS

**Option A**—For fields less than 1/2 mile in length and width: The refuge cotton may be embedded as a continuous block at one edge of the field or at the field perimeter. Cotton growers who choose this option must plant at least 5 (five) acres of non-*B.t.* cotton (refuge cotton) for every 95 acres of Genuity Bollgard II cotton (total of 100 acres).

**Option B**—For fields greater than 1/2 mile in length and/or width: The refuge cotton may be embedded as continuous blocks within the Genuity Bollgard II cotton field and/or perimeter. Plant the refuge in more than one location as needed to comply with the 1/2 mile distance requirement. Cotton growers who choose this option must plant at least 5 (five) acres of non-*B.t.* cotton (refuge cotton) for every 95 acres of Genuity Bollgard II cotton (total of 100 acres).

**Option C**—Single-row, in-field refuge: Due to the unique biology of pink bollworm, and a scarcity of tobacco budworm and cotton bollworm, in some regions, growers may mix individual rows of non-*B.t.* cotton with Genuity Bollgard II cotton. Plant at least one single non-*B.t.* cotton row for every 6 (six) to 10 (ten) rows of

Genuity Bollgard II cotton. This will result in interspersed rows of non-*B.t.* cotton across a Genuity Bollgard II cotton field.

Monsanto cautions growers against using this option in regions that have a history of significant cotton bollworm or tobacco budworm damage. **Check with a qualified expert, including your seed company, crop advisors and/or extension specialists.**

### REFUGE PLANTING

The variety of cotton planted in the refuge must be comparable, especially in the maturity date, to the Genuity Bollgard II cotton for which it serves as refuge. The refuge must be managed similarly to Genuity Bollgard II cotton (example: planting time, use of fertilizers, weed control, irrigation, terminations, and management of other pests).

### TREATMENT (follow all pesticide label directions)



**Prior to squaring\***—The refuge may be treated with any insecticide labeled for cotton, including those to control foliage-feeding caterpillars.

**After squaring**—The refuge may not be treated with any insecticide or pheromone labeled for the control of tobacco budworm, cotton bollworm or pink bollworm, or with sterile pink bollworm.

**Throughout season**—In addition to the above, the refuge and/or Genuity Bollgard II may be treated with labeled insecticides for control of pests other than lepidopteran targets of Genuity Bollgard II cotton.

\*From emergence and prior to squaring, the refuge may be treated with acephate or methyl parathion at approved rates (typically equal to or less than 0.5 pounds of active ingredient per acre) which will not control tobacco budworm or the cotton bollworm, but may control other pests. Follow all pesticide label directions.

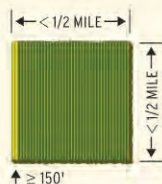
## EMBEDDED REFUGE

 Genuity Bollgard II  Refuge

### OPTION A

Fields **less than** 1/2 mile in length and width:

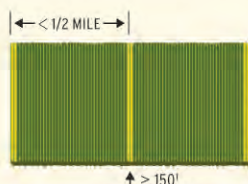
- Plant at least 5 acres of non-*B.t.* cotton for every 95 acres of Genuity Bollgard II cotton.
- Locate refuge within the field.
- Monsanto recommends each refuge be at least 150 feet wide.



### OPTION B

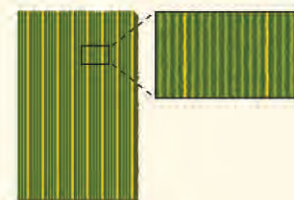
Fields **greater than** 1/2 mile in length and/or width:

- Plant at least 5 acres of non-*B.t.* cotton for every 95 acres of Genuity Bollgard II cotton.
- Plant the refuge in more than one location to ensure compliance with distance requirements.
- Monsanto recommends each refuge be at least 150 feet wide.



### OPTION C

- Plant one single refuge row for every 6 (six) to 10 *B.t.* rows.
- Interspersing single row refuge is not recommended for regions with a history of significant cotton bollworm or tobacco budworm damage.







## 5% EXTERNAL UNSPRAYED REFUGE

Cotton growers who choose this option must plant at least 5 (five) acres of non-*B.t.* cotton (refuge cotton) for every 95 acres of Genuity® Bollgard II® cotton (total of 100 acres).

### SIZE

The size of the refuge must be at least 150 feet wide.

### REFUGE LOCATION

Ensure that a non-*B.t.* cotton refuge is maintained within at least 1/2 linear mile (preferably adjacent, or within 1/4 mile or closer) of the Genuity Bollgard II cotton fields.

In cases where placement of the refuge within 1/4 mile of the Genuity Bollgard II cotton is in conflict with the state seed production regulations, the grower must plant the refuge as close to the Genuity Bollgard II cotton as permitted.

### REFUGE CONFIGURATION OPTIONS

The refuge can be planted as a separate block, or as an adjacent block of a field.

### REFUGE PLANTING

The variety of cotton planted in the refuge must be comparable, especially in the maturity date, to the Genuity Bollgard II cotton for which it serves as refuge. The refuge must be managed similarly to Genuity Bollgard II cotton (example: planting time, use of fertilizers, weed control, irrigation, terminations, and management of other pests).

### TREATMENT (follow all pesticide label directions)

**Prior to squaring\***—The refuge may be treated with any insecticide labeled for cotton, including those to control foliage-feeding caterpillars.

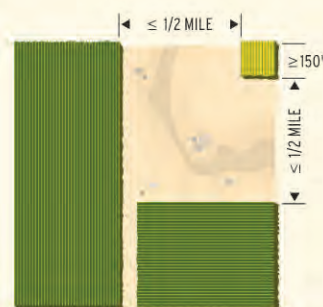
**After squaring**—The refuge may not be treated with any insecticide or pheromone labeled for the control of tobacco budworm, cotton bollworm or pink bollworm, or with sterile pink bollworm.

**Throughout season**—In addition to the above, the refuge and/or Genuity Bollgard II cotton may be treated with labeled insecticides for control of pests other than lepidopteran targets of Genuity Bollgard II cotton.



\*From emergence and prior to squaring, the refuge may be treated with acephate or methyl parathion at approved rates (typically equal to or less than 0.5 pounds of active ingredient per acre) which will not control tobacco budworm or the cotton bollworm, but may control other pests. Follow all pesticide label directions.

## 5% EXTERNAL UNSPRAYED REFUGE

- Plant at least 5 acres of non-*B.t.* cotton for every 95 acres of Genuity Bollgard II cotton.
- The external unsprayed refuge **must be at least 150 feet wide**.
- All associated Genuity Bollgard II cotton fields **must be within 1/2 mile** (preferably adjacent to or within 1/4 mile or closer), field border to field border of the unsprayed refuge.



5% External Unsprayed Option

-  Genuity Bollgard II
-  Refuge





## 20% EXTERNAL SPRAYED REFUGE

Cotton growers who choose this option must plant at least 20 acres of non-*B.t.* cotton (refuge cotton) for every 80 acres of Genuity® Bollgard II® cotton (total of 100 acres).

### SIZE

The size of the refuge must be at least 150 feet wide.

### REFUGE LOCATION

Ensure that a non-*B.t.* cotton refuge is maintained within at least one linear mile (preferably within 1/2 mile or closer) of the Genuity Bollgard II cotton fields.

### REFUGE CONFIGURATION OPTIONS

Refuge can be planted as separate fields, as a block within a field, or at the perimeter of a field.

### REFUGE PLANTING

The variety of cotton planted in the refuge must be comparable, especially in the maturity date, to the Genuity Bollgard II cotton for which it serves as refuge. The refuge must be managed similarly to Genuity Bollgard II cotton (example: planting time, use of fertilizers, weed control, irrigation, terminations, and management of other pests).

### TREATMENT (follow all pesticide label requirements)

At any time during the season, the refuge and/or Genuity Bollgard II cotton may be treated with any labeled insecticide (excluding foliar *B.t.* products) including pheromone. In addition, this area may be treated with sterile pink bollworm.

## 20% EXTERNAL SPRAYED REFUGE

- Plant at least 20 acres of non-*B.t.* cotton for every 80 acres of Genuity Bollgard II cotton.
- The external sprayed refuge **must be at least 150 feet wide.**
- This external sprayed refuge may be treated **with any insecticide** (excluding foliar *B.t.* products).
- All associated Genuity Bollgard II cotton fields **must be within one linear mile** (preferably within 1/2 mile or closer), field border to field border of the sprayed refuge.



20% External Sprayed Option

■ Genuity Bollgard II

■ Refuge





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**IMPORTANT IRM INFORMATION: RIB Complete™** corn does not require the planting of a structured refuge **except** in the Cotton-Growing Area where corn earworm is a significant pest. **Genuity® SmartStax® RIB Complete®, Genuity® VT Double PRO® RIB Complete® and Genuity® VT Triple PRO® RIB Complete®** corn are blended seed corn products. See the IRM Grower Guide for additional information. Always read and follow IRM requirements.

**The Genuity® DroughtGard™ Hybrids trait has been deregulated by the U.S. Department of Agriculture.** Import approvals in key corn export markets with functioning regulatory systems are in progress. For 2013, DroughtGard™ Hybrids will be commercially available in the western great plains area to growers who have signed and agree to follow the Genuity DroughtGard Hybrids Stewardship Agreement. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted.

**Attention:** The U.S. EPA has prohibited the sale, distribution, and planting of seed containing the MON 863 Event, which includes the following Monsanto products: YieldGard® Rootworm, YieldGard Rootworm with Roundup Ready® Corn 2, YieldGard Plus® and YieldGard Plus with Roundup Ready Corn 2. Any remaining inventory of seed containing the MON 863 Event must be handled in accordance with legal and regulatory requirements (non-treated seed can be sold as grain, and treated seed must be disposed of properly). It is a violation of federal law to sell or distribute an unregistered pesticide.

**ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup Ready® crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup® brand agricultural herbicides. Roundup® brand agricultural herbicides will kill crops that are not tolerant to glyphosate. Bollgard II®, DroughtGard™, Genuity and Design®, Genuity®, Monsanto and Vine Design®, Respect the Refuge and Cotton Design®, RIB Complete and Design®, RIB Complete®, Roundup Ready 2 Technology and Design®, Roundup Ready 2 Yield®, Roundup Ready®, Roundup®, SmartStax and Design®, SmartStax®, Transorb and Design®, VT Double PRO®, VT Triple PRO®, YieldGard Corn Borer and Design®, YieldGard VT Rootworm/RR2®, YieldGard VT Triple®, YieldGard VT®, and YieldGard® are trademarks of Monsanto Technology LLC. Ignite® and LibertyLink® and the Water Droplet Design® are registered trademarks of Bayer. Herculex® is a registered trademark of Dow AgroSciences LLC. Respect the Refuge and Corn Design® and Respect the Refuge® are registered trademarks of National Corn Growers Association. All other trademarks are the property of their respective owners.

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