CORN PRODUCT USE GUIDE

U.S. Edition

SmartStax® trait technology
PowerCore® trait technology
Herculex® Insect Protection
Enlist™ corn trait
Refuge Advanced® technology
This Corn Product Use Guide (Guide) sets forth the requirements for growing corn hybrids with Bacillus thuringiensis (Bt) traits, including SmartStax® trait technology, PowerCore® trait technology, Herculex® I Insect Protection and Herculex XTRA Insect Protection. It is important that you read this Guide thoroughly and follow the Insect Resistance Management (IRM) practices contained herein.

Insect Protection Technologies From Dow AgroSciences

<table>
<thead>
<tr>
<th>Above-ground Pests</th>
<th>SmartStax®¹</th>
<th>PowerCore®¹</th>
<th>Herculex® I</th>
<th>Herculex XTRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Corn Borer</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Southwestern Corn Borer¹</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Sugarcane Borer</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Corn Earworm²</td>
<td>Control¹</td>
<td>Control¹</td>
<td>Suppression</td>
<td>Suppression</td>
</tr>
<tr>
<td>Fall Armyworm²</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Southern Corn Stalk Borer</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Lesser Cornstalk Borer</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Black Cutworm</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Below-ground Pests</th>
<th>Separate Refuge (Corn Belt)</th>
<th>Separate Refuge (Cotton Belt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Corn Rootworm¹</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Mexican Corn Rootworm</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>Northern Corn Rootworm</td>
<td>Control</td>
<td>Control</td>
</tr>
</tbody>
</table>

¹Routine applications of insecticides to control the indicated insects are usually unnecessary when hybrids with SmartStax® trait technology or PowerCore® trait technology are planted.
²For these pests, decreased efficacy of some Bt traits has been reported under certain circumstances. Please consult with your sales representative, agronomist or university Extension specialist to understand and plan to use best management practices (BMPs) for your area. Visit www.traitstewardship.com for more information.
³Cry1A.105 and Cry2Av2 from Bt controls or suppresses corn earworm.

TECHNOLOGY USE AGREEMENT
You must have a valid, executed Technology Use Agreement on file with Dow AgroSciences to legally obtain, plant and grow hybrids that contain Bt technology from Dow AgroSciences. Failure to comply with the terms of the Technology Use Agreement or this Guide, including any refuge requirements, can result in losing the privilege to grow Bt corn. You must communicate all applicable terms, conditions and restrictions on your corn to all persons and entities possessing or taking an interest in your corn crop and/or the grain therefrom. A Technology Use Agreement may be signed electronically online at www.agcelerate.com. For additional information, visit www.traitstewardship.com, call 877-4-TRAITS (877-487-2487) or contact your seed provider. Signing a Technology Use Agreement with Dow AgroSciences entitles you access to the most current Product Use Guide and other periodic updates relating to Bt corn. If you are growing Enlist™ corn, it is important that you also read and follow the Enlist Product Use Guide for additional requirements specific to the Enlist weed control system.

INSECT RESISTANCE MANAGEMENT (IRM)
The U.S. Environmental Protection Agency (EPA) requires that a refuge consisting of non-Bt corn be planted within or adjacent to each Bt cornfield. Select states or select products may offer the option to plant refuge up to a half-mile from the Bt field. A refuge provides an area where insects susceptible to the Bt proteins can survive to mate with any rare resistant individuals that may survive, passing Bt-susceptibility on to the next generation. A non-Bt refuge planted within each Bt cornfield provides an effective refuge for corn borers and corn rootworms (CRWs) while ensuring the distance requirement is met. Dow AgroSciences, the EPA and university experts agree that refuges help prevent or delay development of resistance to the Bt trait in target pest populations. SmartStax® Refuge Advanced® and PowerCore® Refuge Advanced products contain a minimum 5 percent non-Bt seed and satisfy the refuge requirements for the Corn Belt. Separate refuge is required for all SmartStax Refuge Advanced and PowerCore Refuge Advanced products planted in the Cotton Belt.

If you observe unexpected target pest feeding damage to fields planted with corn containing SmartStax® trait technology, PowerCore® trait technology or Herculex® Insect Protection, you should immediately contact your seed provider, sales representative or Dow AgroSciences at 877-4-TRAITS (877-487-2487).
The cotton-growing region consists of the following states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi (only Dunklin, New Madrid, Pemiscot, Scott and Stoddard counties), North Carolina, Oklahoma (only Beckham, Caddo, Comanche, Custer, Greer, Harmon, Jackson, Kay, Kiowa, Tillman and Washita counties), South Carolina, Tennessee (only Carroll, Chester, Crockett, Dyer, Fayette, Franklin, Gibson, Hardeman, Hardin, Haywood, Lake, Lauderdale, Lincoln, Madison, Obion, Rutherford, Shelby and Tipton counties), Texas (except Carson, Dallam, Hansford, Hartley, Hutchinson, Lipscomb, Moore, Ochiltree, Roberts and Sherman counties) and Virginia (only Dinwiddie, Franklin City, Greensville, Isle of Wight, Northampton, Southampton, Suffolk City, Surry and Sussex counties).

### Refuge Size and Distance by Region

<table>
<thead>
<tr>
<th>Growing Region</th>
<th>Refuge Icon</th>
<th>Refuge Size Requirement (Corn Belt)</th>
<th>Refuge Distance Requirement</th>
<th>Refuge Icon</th>
<th>Refuge Size Requirement (Cotton Belt)</th>
<th>Refuge Distance Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn Belt — Separate Refuge</td>
<td>SmartStax® Refuge Advanced®</td>
<td>0%</td>
<td>None</td>
<td>Not for sale or planting in cotton region.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PowerCore® Refuge Advanced</td>
<td>0%</td>
<td>None</td>
<td>20%</td>
<td>Within, adjacent or up to a half-mile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SmartStax</td>
<td>5%</td>
<td>Within or adjacent</td>
<td>20%</td>
<td>Within or adjacent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PowerCore</td>
<td>5%</td>
<td>Within, adjacent or up to a half-mile</td>
<td>20%</td>
<td>Within, adjacent or up to a half-mile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Herculex® I Insect Protection</td>
<td>20%</td>
<td>Within, adjacent or up to a half-mile</td>
<td>50%</td>
<td>Within, adjacent or up to a half-mile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Herculex XTRA Insect Protection</td>
<td>20%</td>
<td>Within or adjacent</td>
<td>50%</td>
<td>Within or adjacent</td>
<td></td>
</tr>
</tbody>
</table>

5% equals 5 acres of non-Bt corn for every 95 acres of Bt corn planted
20% equals 20 acres of non-Bt corn for every 80 acres of Bt corn planted
50% equals 50 acres of non-Bt corn for every 50 acres of Bt corn planted

### Half-mile Option — Select States Only

<table>
<thead>
<tr>
<th>Growing Region</th>
<th>Refuge Icon</th>
<th>Refuge Size Requirement (Corn Belt)</th>
<th>Refuge Distance Requirement</th>
<th>Refuge Icon</th>
<th>Refuge Size Requirement (Cotton Belt)</th>
<th>Refuge Distance Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SmartStax®</td>
<td>5%</td>
<td>Within, adjacent or up to a half-mile (Half-mile option only available in below states)</td>
<td>20%</td>
<td>Within, adjacent or up to a half-mile (Half-mile option only available in below states)</td>
<td></td>
</tr>
</tbody>
</table>

The additional option to plant a common refuge up to a half-mile from a SmartStax® cornfield is only available to growers in the following states where western, northern and Mexican corn rootworms are not significant: AK, AL, AR, AZ, CA, CT, DE, FL, GA, HI, ID, IA, IL, IN, KS, LA, MA, MD, MS, MT, NC, NH, NJ, NM, NY, OH, OR, PA, RI, TN, TX, UT, VA, WA, WV and WY.
REFUGE PLANTING

The refuge must be planted with corn hybrids that do not contain Bt technologies for the control of corn borer or CRW. The refuge can be planted with herbicide-tolerant or conventional corn. The refuge and Bt corn should be sown on the same day or within the shortest window possible between planting dates to ensure corn development is similar among varieties. Growers are encouraged to plant the CRW refuge in the same location each year to maintain CRW populations that are expected to extend the durability of the Bt technology.

For SmartStax® trait technology and Herculex® XTRA Insect Protection, if the refuge is planted on rotated ground, then the Bt corn also must be planted on rotated ground. If the refuge is planted on land used continuously for corn, the Bt field may be planted on either continuous or rotated land. This option is encouraged where western corn rootworm rotation-resistant biotype (soybean variant) may be present.

Ensure you plant sufficient refuge to meet the size requirement for each of your Bt corn products and fields. The National Corn Growers Association’s (NCGA’s) Refuge Calculator (www.irmcalculator.com) can assist in calculating total refuge required for your Bt corn.

REFUGE LOCATION AND CONFIGURATION OPTIONS

The structured refuge may be planted as an in-field refuge or an adjacent (e.g., across the road) refuge. Refuge required for Herculex I Insect Protection and PowerCore® trait technology as well as SmartStax in states where CRWS are not significant (see list on Refuge Requirements page) also may be planted as a separate block that is within a half-mile of the Bt field. In-field refuge options include blocks, perimeter strips (i.e., strips around the field) or in-field strips. In-field blocks or strips must be at least four consecutive rows wide. Seed mixtures of Bt and non-Bt corn (other than the mixture provided as Refuge Advanced®) are not permitted. When switching between Bt hybrids and the seed to be planted in the refuge, planter hoppers should be cleaned out to avoid inadvertent mixing of seed. Growers should calculate the acres required for refuge and plant the appropriate amount of refuge seed for the configuration option selected. For example, in choosing to plant in-field strips, a grower must calculate how much refuge seed is needed to meet the minimum refuge requirement and fill the refuge planter boxes with that amount. Strips should be planted until the minimum refuge seed is completely used. The remainder of the field can then be planted with Bt seed in all planter boxes.

Common refuge options

<table>
<thead>
<tr>
<th>Field Edge</th>
<th>Compact Block</th>
<th>Headland</th>
<th>Across Field</th>
<th>Splitting Planter</th>
<th>Perimeter</th>
<th>Adjacent Field</th>
</tr>
</thead>
</table>

Additional refuge options for Herculex® I Insect Protection, PowerCore® and SmartStax® (select states only for SmartStax)

Half-mile

Separate refuge option for Herculex® XTRA Insect Protection

When planting Herculex® XTRA Insect Protection, separate refuges may be independently planted for corn borers and corn rootworms, respectively. For example, a refuge can be planted for corn borers that contains a trait providing corn rootworm protection but not corn borer protection, while a second refuge is planted for corn rootworms that could contain a trait for corn borer protection but not corn rootworm protection.

Illustrations are not a representation of refuge size requirements. Please see “Refuge Size and Distance by Region” section for minimum refuge requirements by product and region.
CORN ROOTWORM BEST MANAGEMENT PRACTICES

Follow recommended Integrated Pest Management (IPM) practices, including multi-year crop rotation strategy, cultural control, scouting and appropriate use of pest control. For fields with a history of, or at risk for, large populations of CRW, such as those planted to continuous corn, the following best management practices are recommended.

- **Rotate Crops:** Crop rotation to a non-host crop such as soybeans (or an alternative crop) helps lower the CRW pressure and break the pest cycle.

- **Multiple Modes of Action:** Planting corn hybrids with pyramided CRW traits (such as SmartStax® trait technology) versus single CRW-trait hybrid, helps improve CRW control. Consider using a non-CRW Bt corn (such as PowerCore® trait technology) or non-Bt corn in some years.

- **Scout Fields:** Scout for CRW larvae and adult beetles to determine economic pressure and evaluate appropriate control measures.

- **Insecticide Use:** The application of an insecticide to the soil surface, in furrows and/or incorporated into the soil (referred to as “insecticide,” “soil insecticide” or “SAI”) is not recommended for control of CRW in Bt-treated corn products except under limited circumstances and in consultation with Extension, crop consultants or other local experts. SAIs should not be necessary for CRW control with pyramided CRW trait Bt corn products such as SmartStax.

- **See www.traitstewardship.com or www.ncga.com/cornrootworm for additional information on CRW refuge requirements and best management practices.**

REFUGE PEST MANAGEMENT TREATMENT OPTIONS

Refuge acres provide an area where Bt-susceptible insects can feed and breed with potentially resistant insects of the same type, thus helping to ensure resistance does not occur. Growers are strongly encouraged to scout refuge areas for all pest damage and apply insecticides only if the economic threshold for one or more pests (lepidopteran, as well as other pests) is exceeded, in accordance with the following refuge pest management requirements.

Corn borer refuge

Insecticide treatments for control of European corn borer, southwestern corn borer, corn earworm and other lepidopteran target pests listed in this Guide may be applied only if economic thresholds are reached for one or more of these target pests. Consult your local or regional professionals (e.g., Extension service agents, crop consultants) to determine economic thresholds. Microbial Bt insecticides must not be applied to the refuge.

Corn rootworm refuge

Soil-applied insecticides or seed treatments may be used to provide CRW protection in the refuge. Aerial insecticides may be used in the refuge for control of CRW adults; however, the same treatment also must be applied at the same time to the CRW-protected Bt corn.

To control pests other than adult CRWs in the refuge, an insecticide labeled for CRW control can be used on the refuge portion only if no adult CRWs are present or if the same treatment is applied to the CRW-protected Bt corn at the same time.

HERBICIDE TOLERANCE

Some Bt corn hybrids are available with the Enlist®, Roundup Ready® or LibertyLink® herbicide tolerance traits, making them tolerant to over-the-top applications of Enlist Duo® herbicide (Enlist), glyphosate (Roundup Ready) or glufosinate-ammonium (LibertyLink) herbicides.

Verify the weed control system before making over-the-top herbicide applications. Always read and follow label directions. Use of a herbicide over-the-top of a corn hybrid that does not contain the tolerance trait for the herbicide will cause crop damage.

REFUGE CALCULATOR

The NCGA, in collaboration with the industry, has developed a web-based calculator to help growers calculate the minimum refuge requirements for each of the Bt corn products on their farms. This calculator can be accessed at www.irmcalculator.com.

Refer to this diagram for the examples below.

\[ \text{Total Corn Acres} \times \text{Percent of Required Refuge} = \text{Refuge Acres} \]

\[ \text{Refuge Acres} - \text{Bt Acres} = \text{Refuge Corn Acres} \]

*Includes all corn acres that are in-field or adjacent to each other and will be allocated to the Bt product and its associated refuge.

**The WRONG Way to Calculate**

Example shown is for a 20% refuge product.

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

Example: 160 \times 20\% = 32

This is NOT the correct minimum refuge size.

**The CORRECT Way to Calculate**

Example shown is for a 20% refuge product.

START with the TOTAL number of corn acres you want to plant in an area.

Example: A 200 \times 20\% = 40

This is your minimum REFUGE ACRES.

Next, subtract your refuge acres from your total corn acres.

Example: 200 - 40 = 160

This is your minimum Bt ACRES.

For additional information on how to calculate your required refuge acres, refer to the National Corn Growers Association IRM Refuge Calculator at www.irmcalculator.com.
These steps include: maintaining a non-corn buffer between seed can only be Any grain or material produced from Bt seed can only be exported to or used in, processed in or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotechnology traits across boundaries into nations where import is not permitted. Talk to your grain handler or purchaser in advance to facilitate appropriate crop and grain or material handling and marketing.

For further information about your crop or grain marketing options, contact Dow AgroSciences at 877-4-TRAITS (877-487-2487). Information regarding the regulatory and market status of agricultural biotechnology products can be found at: www.biotradestatus.com.

**RESTRICTED LOCATIONS**
Puerto Rico: Herculex® Insect Protection is not available for sale, distribution or commercial use in Puerto Rico.

**COEXISTENCE**
Corn is a naturally cross-pollinated crop, and a small amount of corn pollen movement to nearby fields is common. Growers can take steps to reduce the occurrence and extent of undesired pollen movement.

These steps include: maintaining a non-corn buffer between Bt cornfields and non-Bt cornfields; not growing Bt corn upwind (based on the prevailing wind directions) of non-Bt cornfields; and discussing your cropping plans with your neighbors in advance.

In addition, planting the IRM refuge as non-Bt corn in border/headland blocks may reduce the possibility that Bt corn pollen will reach non-Bt corn outside the field.

**IRM COMPLIANCE ASSURANCE PROGRAM**
The EPA and the Agricultural Biotechnology Stewardship Technical Committee (ABSTC) have instituted the IRM Compliance Assurance Program to verify compliance with IRM requirements detailed in this Guide. An IRM compliance assurance program requires all registrants of Bt corn products (including Dow AgroSciences) to evaluate growers’ adherence to the IRM requirements and verify that those growers who do not adhere to the IRM requirements are brought back into compliance or are denied access to their Bt corn hybrids.

**IRM TIPS LINE**
Bt corn seed companies are required by the EPA to establish a system to collect information about alleged instances of noncompliance with IRM requirements. If you have a tip or complaint, please call the Dow AgroSciences toll-free IRM Tips & Complaints phone line at 877-4-TRAITS (877-487-2487).

Always consult your trait provider’s technical guides before planting or go to http://ncga.adayana.com for more information. Please direct any questions about this Guide or Bt products to your seed provider or to Dow AgroSciences at: 877-4-TRAITS (877-487-2487).

By opening this bag or planting this seed, you acknowledge and agree, personally and on behalf of the individual or entity that purchased this seed ("Grower"), to be bound by the terms and conditions of the following documents in effect at the time of planting of this seed: (i) the Dow AgroSciences Technology Use Agreement, and (ii) the Corn Product Use Guide, including the Insect Resistance Management (IRM) requirements detailed therein. Both of these documents are available at www.traitstewardship.com. In consideration of the foregoing, Dow AgroSciences grants to the Grower the limited license to produce only a single commercial crop in the United States under the terms and conditions set forth in the Dow AgroSciences Technology Use Agreement in effect at the time of planting of this seed. Carefully review this Guide, the Technology Use Agreement and the seed bag and tag language for important limitation of warranty information.