

Pioneer Optimum[®] AcreMax[™] 1

Discussion Guide



May 14, 2010

Q & A on Optimum[®] AcreMax[™] 1



What is Optimum[®] AcreMax[™] 1?

- Optimum[®] AcreMax[™] 1 contains a blend of 90 percent Herculex[®] XTRA and 10 percent Herculex[®] 1.
 - Herculex[®] XTRA provides a single mode of action against corn borer and corn rootworm pests, while Herculex[®] I provides a single mode of action against corn borers.
 - This system relies on a 10 percent blended refuge for a **single mode of action** against corn rootworm only, potentially putting at **risk the durability of the technology** in all products that use it, including Genuity[®] SmartStax[™].

Is Optimum[®] AcreMax[™] 1 new technology?

- No. It utilizes first generation technology with Herculex[®] from Dow AgroSciences that was introduced nine years ago.

Is Optimum[®] AcreMax[™] 1 Refuge-In-A-Bag (RIB)?

- A complete RIB product is a single-bag system that contains **all** the of the required refuge requirements. Pioneer's Optimum[®] AcreMax[™] 1 is a **two-bag system**: interspersed *B.t.* seed in one bag for corn rootworm and a separate bag for corn borer refuge.
 - With Optimum[®] AcreMax[™] 1, farmers will still need to plant a separate **20 percent** structured refuge in the Corn Belt for above-ground pests – this isn't a single-bag solution and does not simplify refuge compliance.

Won't I see a yield loss with 10 percent of my plants unprotected against corn rootworm?

- Pioneer noted in their presentation to the Scientific Advisory Panel in February 2009 that greater than 5 percent blended refuge for corn rootworm could have increased root lodging and yield loss. (Slide 3)
- Pioneer originally requested a blended refuge for corn rootworm of 2%-5%. The EPA registered a 10% blended refuge product.
- A recent University of Illinois study showed nearly half of farmers would NOT be willing to plant a product that had more than five percent non-*B.t.* seed. (Slide 4)

In a Presentation to the EPA Scientific Advisory Panel – Feb., 2009, Pioneer specifically stated:

- *The limits of Rootworm Blended Refuge for Herculex® Xtra*
 - *Limited durability for rootworm refuge blend >5%*
 - *High blend rates would be unacceptable to grower*
 - *Would have increased root lodging*
 - *And, YIELD LOSS in stressful environments*

University of Illinois - Farmer Reaction to >5% Rootworm Refuge Blend

The Bulletin – Establishment of Refuges Critical in Maintaining Durability of *B.t.* Hybrids

University of Illinois Extension, Author: Mike Gray

- Approximately 90% indicated their willingness to use a seed blend that contained non-*B.t.* seed in the 2% to 5% range.
- **However, if the non-*B.t.* seed falls in the 6% to 10% range, interest falls below 60%.**

544 Farmers Surveyed at 2010 Corn & Soybean Classics
The Bulletin No. 2 Article 1/April 9, 2010

Genuity® SmartStax™ – The Most Advanced, All in One Corn Trait



	Genuity® SmartStax™	Herculex® Xtra	Optimum® AcreMax™1
European Corn Borer <i>(Ostrinia nubilalis)</i>	***	*	*
Southwestern Corn Borer <i>(Diatraea graandiosella)</i>	***	*	*
Northern Corn Rootworm <i>(Diabrotica barberi)</i>	**	*	*
Western Corn Rootworm <i>(Diabrotica virgifera virgifera)</i>	**	*	*
Corn Earworm¹ <i>(Helicoverpa zea)</i>	**		
Fall Armyworm <i>(Spodoptera frugiperda)</i>	***	*	*
Western Bean Cutworm <i>(Richia albicosta)</i>	*	*	*
Black Cutworm <i>(Agrotis ipsilon)</i>	*	*	*
Herbicide Tolerance	Roundup Ready® LibertyLink®	Roundup Ready® LibertyLink®	Roundup Ready® LibertyLink®
Refuge (Corn Belt)	5%	20%	10% for below² 20% for above

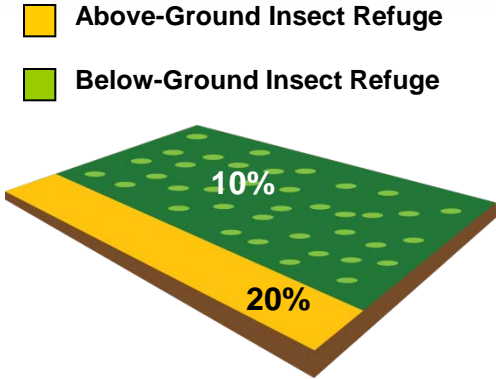
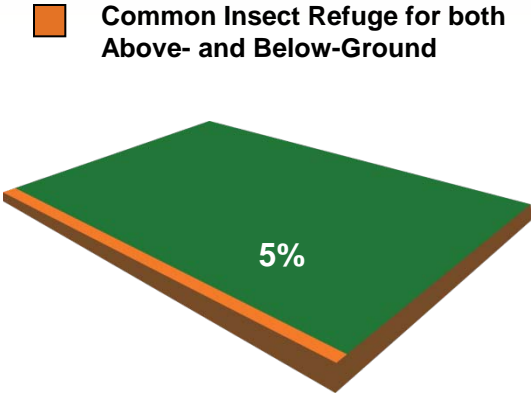
* Mode of Action for Control

¹Pioneer claims control of Corn Earworm on the OAM1 label, MON and DAS data suggests suppression only . The Herculex® 1 label claims suppression only.

²Refuge for OAM1 is partially in the bag

Comparing Refuge Requirements

	Genuity® SmartStax™	Optimum® AcreMax™ 1
Estimated Launch Date	2010	2011
Above-Ground Insect Refuge –% of Field	5%	20%
Below-Ground Insect Refuge –% of Field	5%	10%
Total Refuge Required (in Corn Belt)	5%	20% External Refuge + 10% In Field Refuge





What are Monsanto's Plans for RIB Testing?

2010 Genuity® SmartStax™ RIB Trial Objectives

- **Internal: Demonstrate whole farm yield advantage of Genuity® SmartStax™ and Genuity® SmartStax™ RIB**
 - **50+ Locations** with Territory Agronomists, Learning Centers and Universal Training Sites comparing Genuity® SmartStax™, Genuity® SmartStax™ RIB against the Pioneer Herculex® Xtra and Herculex® 1 systems
 - Broadly testing Genuity® SmartStax™, Genuity® SmartStax™ RIB and Roundup Ready® Corn 2 entries in PCM4 (formerly FACT) testing program **500+ locations**
 - Technology Development - Genuity® SmartStax™ RIB trials in areas with known pressure from CRW, SWCB, CEW, FAW and SCB—**60 large plot locations**
 - Genuity® SmartStax™ RIB with Academics—Established with northern academics on trap crops to generate 3rd party support of Genuity® SmartStax™ RIB root protection and yield—**Univ. of IL, ISU, Univ. of MN, Univ. of NE, Monmouth Agronomy Farm**
- **External: Whole Farm trials with farmers in all Midwest corn states (300+ trials)***
 - 15-20 acres of adapted, new genetics as Genuity® SmartStax™ RIB to PCM4 cooperating growers
 - Plus 40-60 acre whole field Genuity® SmartStax™ RIB trials (2 in IL, 2 in IA and 1 in IN)

**separate 5% refuge is still required*

Optimum[®] AcreMax[™]1 Summary

- **Two Bag System – Still need 20% refuge for above ground pests**
- **Risk - 10% of Plants Vulnerable to Corn Rootworm**
- **Spectrum - No Corn Earworm Protection**
- **BE – No Savings with Biotechnology Endorsement**
- **Old Technology – Herculex[®] 1 and Herculex[®] Xtra**
- **Single Mode Product – EPA Estimates 45% Less Durable than a 20% block refuge**
- **Time Limited Registration – Expires September 30, 2010**

	Genuity[®] SmartStax[™]	Optimum[®] AcreMax[™]1¹
Above Ground Refuge	5%	20%
Below Ground Refuge	5%	10%

¹Below Ground refuge is in bag

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B.t. products may not yet be registered in all states. Check with your Monsanto representative for the registration status in your state.

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	<p>Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements.</p>
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