

## 2015 *Bt* Corn Products for the Southeastern United States

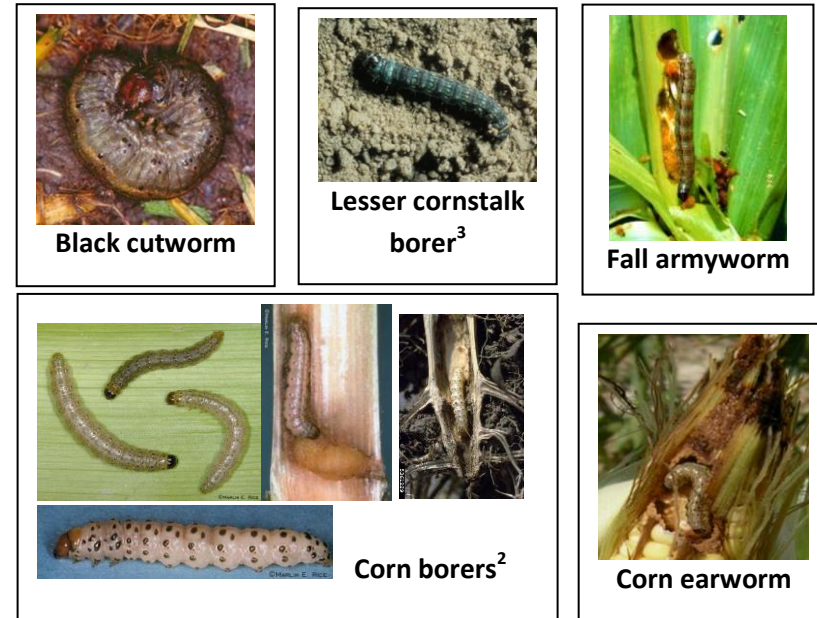
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Most corn hybrids now contain several transgenic traits for insect control and herbicide tolerance. Currently all transgenic insect control traits are various proteins derived from the bacterium called *Bacillus thuringiensis* (*Bt*). *Bt* corn traits can be divided into two categories, those that target above ground caterpillar (lepidopteran) pests such as corn borers, and those that target below ground or soil inhabiting corn rootworms. The table on the next page summarizes the currently available *Bt* corn products for the southern region. The table lists the specific *Bt* proteins and events, herbicide resistance traits, and relative efficacy of traits for controlling specific target insect pests.

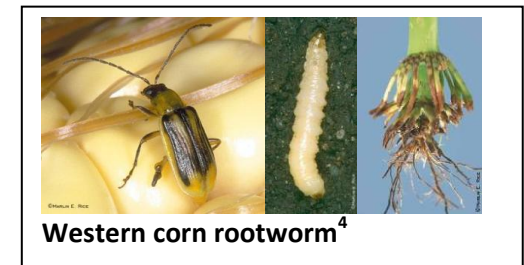
Insecticide resistance management (IRM) is required for all *Bt* traits in corn and includes structured refuge of non-*Bt* corn. Refuge requirements are different for the northern corn-belt and the southern cotton-growing areas of the United States. Refuge requirements also differ among hybrids with one or more *Bt* traits. Single above-ground trait products require a 50% non-*Bt* refuge. Most multiple above-ground trait products require a 20% non-*Bt* corn refuge. Details concerning the placement and arrangement of refuges also vary among *Bt* corn products.<sup>5</sup> The table lists the size of the non-*Bt* corn refuge. Seed bag tags will have details about product IRM requirements, refuge amount and refuge placement options.

**Herbicide Traits**      GT, Glyphosate tolerant  
                                  LL, Liberty Link (glufosinate tolerant)  
                                  RR2, Roundup Ready 2 (glyphosate tolerant)

## Target Above-Ground Insect Pests



## Target Below-Ground (in soil) Insect Pest



Footnotes:

<sup>2</sup>European corn borer, Southwestern corn borer, sugarcane borer, and others. <sup>3</sup>Lepidopteran *Bt* traits do not specifically list lesser cornstalk borer (LCB) as a target pest. <sup>4</sup>*Bt* rootworm traits target the western corn rootworm larvae, which occurs in areas such as north Alabama and north Georgia. These traits are not effective against southern corn rootworm.

Originally published in Alabama Cooperative Extension System Corn IPM Guide, a chapter of the Alabama Pesticide Handbook ( <http://www.aces.edu/pubs/docs/A/ANR-500-A>). Based on input from the Southern Corn Insect Working Group who meet at the Annual Meeting of the Southeastern Branch, Entomological Society of America. Format adapted from Univ. of Wisconsin Extension and Michigan State Field Crops Entomology Program CDD #028 by Chris DiFonzo and Eileen Cullen. We thank Marlin Rice, Xinzhi Ni, John All, and Frank Peairs for use of their photos. Published by the University of Georgia and the Alabama Cooperative Extension System (Alabama A&M University and Auburn University), equal opportunity educators and employers. Products and trade names are for illustrative purposes only, and their use does not imply endorsement by these organizations.

**Bt Corn Products for the Southeastern United States, version 2015**

Product Trade Name (Abbreviation)	Bt protein(s)	Amount of Insect Control <sup>1</sup>						Herbicide tolerance <sup>5</sup>	Refuge Require- ment in the South <sup>6</sup>	Event(s)	
		Corn Earworm (ear)	Fall army- worm (whorl)	Corn Borers <sup>2</sup> (stalk)	Black Cutworm (seed- ling)	LCB <sup>3</sup> (seed -ling)	Corn Root- worm (roots) <sup>4</sup>				
		-----Above-ground -----						In soil			
<b>Agrisure Products</b>											
Agrisure 3011	Cry1Ab mCry3A	F	G	E	P	G	F-G	GT LL	50%,	Bt11, MIR604, GA21	
Agrisure Viptera 3110	Vip3Aa20 Cry1Ab	E	E	E	G	G	--	GT LL	20%	MIR162, Bt11, GA21	
Agrisure Viptera 3111	Vip3Aa20 Cry1Ab mCry3A	E	E	E	G	G	F-G	GT LL	20%	MIR162, Bt11, MIR604, GA21	
Agrisure Viptera 3220	Vip3Aa20 Cry1Ab Cry1F	E	E	E	VG	VG	--	GT LL	20%	MIR162, Bt11, TC1507, GA21	
<b>Herculex and Optimum Products</b>											
Herculex I (HX1)	Cry1F	P	VG	E	G	G	--	LL	50%	TC1507	
Herculex XTRA (HXX)	Cry1F Cry34Ab1/Cry35Ab1	P	VG	E	G	G	E	LL	50%	TC1507, DAS-59122-7	
Optimum Intrasect (YHR)	Cry1F Cry1Ab	F-G	VG	E	VG	VG	--	LL RR2	20%	TC1507, MON810	
Optimum Intrasect XTRA (YXR)	Cry1F Cry1Ab Cry34Ab1/Cry35Ab1	F-G	VG	E	VG	VG	E	LL RR2	20%	TC1507, MON810, DAS-59122-7	
Optimum Leptra	Cry1F Cry1Ab Vip3Aa20	E	E	E	VG	VG	--	LL RR2	20%	TC1507, MON810 MIR162	
<b>YieldGard Products</b>											
YieldGard Corn Borer (YGCB)	Cry1Ab	F	G	E	P	G	--	--	50%	MON810	
YieldGard VT Triple (VT3)	Cry1Ab Cry3Bb1	F	G	E	P	G	VG	RR2	50%	MON810, MON88017	
<b>Genuity/SmartStax Products</b>											
Genuity VT Double PRO (GENVT2P)	Cry1A.105 Cry2Ab2	G-VG	E	E	P	VG	--	RR2	20%	MON89034, NK603	
Genuity VT Triple PRO (GENVT3P)	Cry1A.105 Cry2Ab2 Cry3Bb1	G-VG	E	E	P	VG	VG	RR2	20%	MON89034, MON88017	
SmartStax (SSX, Dow) or Genuity SmartStax (GENSS, Monsanto)	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34Ab1/Cry35Ab1	VG	E	E	G	VG	E	LL RR2	20%	MON89034, TC1507, MON88017, DAS-59122-7	
POWERCORE (Dow)	Cry1A.105 Cry2Ab2 Cry1F	VG	E	E	G	VG	--	LL RR2	20%	MON89034, TC1507	

1 E = excellent, VG = very good, G = good, F = fair, P = poor. Excellent usually means better than 95 percent control. Poor means less than about 30% control 2 Southwestern corn borer, European corn borer, and sugarcane borer, and others. 3 Lepidopteran Bt traits do not specifically list lesser cornstalk borer (LCB) as a target pest. 4 Bt rootworm traits target western corn rootworm larvae (CRW), which occurs in areas such as north Alabama and north Georgia. These traits are not effective against southern corn rootworm.5 GT = Glyphosate tolerant; LL= Liberty Link (glufosinate tolerant); RR2= Roundup Ready 2 (glyphosate tolerant). 6See product Insect Resistance Management (IRM) documentation from the seed companies for more details. 7Resistance to Cry1F has been reported in some areas of the Southeast. Adapted from D. Buntin and K. Flanders, 2014, Bt Corn Products for the Southeastern United States. Based on input from the Southern Corn Insect Working Group and the Southern Row Crop Insects Group.