Handy Bt Trait Table eVOIDion

November 2010	**Chris DiFonzo, Michigan State University and Eileen Cullen, University of Wisconsin**	**Pictures:** Iowa State Image Gallery (Marlin Rice) and Chris DiFonzo

With the increase in the number of traits stacked into individual transgenic corn hybrids, there is also more potential confusion at the time of seed purchase. This year and next, there is the potential for still greater confusion with the approval of several new product lines and trait combinations with modified refuge requirements. This is the first time in corn that different products from different seed companies can have different refuges. Growers purchasing Bt seed sign an agreement to plant and maintain a certain amount of refuge corn, so it is important to understand which products have reduced refuge and, more importantly, which do not.
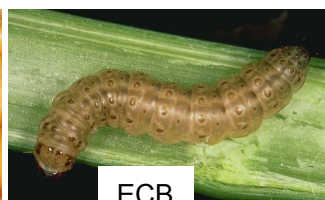
With the increasing complexity comes the risk of ordering unnecessary traits, forgetting what hybrids were ordered back in the fall, forgetting which seed lot was planted where, planting an incorrect refuge, and expecting too much (or something different) from a particular trait. To add another wrinkle, the price of seed has steadily risen over the last few years - $300 or more per bag is not unheard of for transgenic hybrids with seed treatments. Planting the right stack for a particular farm, with the correct refuge, becomes even more important. The table on the second page of this handout summarizes the products and traits currently available, along with the spectrum of control and suppression. The table also lists refuge requirements and location. In previous seasons, the requirement for Bt corn in the Midwest was a 20% 'structured' refuge for both European corn borer and corn rootworm. As highlighted in the table, several products are now approved for either a reduced refuge or a Refuge-In-Bag (RIB), where the seed company mixes non-Bt seed in with the transgenic corn prior to bagging.

Insect targets listed in the table

BCW   black cutworm
CEW   corn earworm
CRW   corn rootworm
ECB   European corn borer
FAW   fall armyworm
SB   stalk borer
WBC   western bean cutworm

WBC

ECB

BCW

CRW

SB

Herbicide traits listed in the table

GT   glyphosate tolerant
LL   Liberty Link or glufosinate tolerant
RR2 Roundup Ready or glyphosate tolerant

Trait Group [Current November 2010]	Bt protein	Insects **controlled** or *suppressed*	Herbicide tolerant?	Refuge % & location
VOID		Agrisure [Syngenta + Mycogen/DowAgro]		
Agrisure CB/LL	Cry1Ab	**ECB** *CEW, FAW, SB*	LL	20% - ½ mile
Agrisure GT/CB/LL	Cry1Ab	**ECB** *CEW, FAW, SB*	GT, LL	20% - ½ mile
Agrisure RW	mCry3A	**CRW**	--	20% - adjacent
Agrisure GT/RW	mCry3A	**CRW**	GT	20% - adjacent
Agrisure CB/LL/RW	Cry1Ab mCry3A	**CRW, ECB** *CEW, FAW, SB*	LL	20% - adjacent
Agrisure 3000GT	Cry1Ab mCry3A	**CRW, ECB** *CEW, FAW, SB*	GT, LL	20% - adjacent
Agrisure Viptera 3110	Cry1Ab Vip3A	**BCW, CEW, ECB, FAW, WBC** *SB*	GT, LL	20% - ½ mile
Agrisure Viptera 3111	Cry1Ab mCry3A Vip3A	**BCW, CEW, CRW, ECB,FAW, WBC** *SB*	GT, LL	20% - adjacent
		Herculex [Mycogen/ DowAgro]		
Herculex 1	Cry1F	**BCW, ECB, FAW,WBC** *CEW*	LL, RR2	20% - ½ mile
Herculex RW	Cry34/35Ab1	**CRW**	LL	20% - adjacent
Herculex XTRA	Cry1F Cry34/35Ab1	**BCW, CRW, ECB, FAW, WBC** *CEW*	LL RR2 (some)	20% - adjacent
		Optimum [DuPont /Pioneer]		
Optimum AcreMax1	Cry1F Cry34/35Ab1	**BCW, CRW, ECB, FAW, WBC** *CEW*	LL, RR2	10% in the bag (CRW) **plus** 20% - ½ mile (ECB)
Optimum AcreMax RW	Cry34/35Ab1	**CRW**	RR2	10% (non-Bt seed) in the bag
Optimum Intrasect Insect protection	Cry1F Cry1Ab	**ECB, WBC, BCW, FAW** *CEW, SB*	LL, RR2	5% - ½ mile
		Yieldgard [Monsanto]		
YieldGard CB (YGCB)	Cry1Ab	**ECB** *CEW, FAW, SB*	--	20% - ½ mile
YieldGard RW (YGRW)	Cry3Bb1	**CRW**	--	20% - adjacent
YieldGard Plus	Cry1Ab Cry3Bb1	**CRW, ECB** *CEW, FAW, SB*	YGPlus w/RR2	20% - adjacent
YieldGard VT Rootworm	Cry3Bb1	**CRW**	RR2	20% - adjacent
YieldGard VT Triple (VT3)	Cry1Ab Cry3Bb1	**CRW, ECB** *CEW, FAW, SB*	RR2	20% - adjacent
		Genuity [Monsanto or Monsanto + Mycogen/DowAgro]		
Genuity VT Double Pro (VT2P)	Cry1A.105 Cry2Ab2	**CEW, ECB, FAW**	RR2	5% - ½ mile
Genuity VT Triple Pro (VT3P)	Cry1A.105 Cry2Ab2 Cry3Bb1	**CEW, CRW, ECB, FAW**	RR2	20% - adjacent
SmartStax or Genuity SmartStax (GENSS)	Cry1A.105 Cry2Ab2 Cry1F Cry34/35Ab1 Cry3Bb1	**BCW, CEW, CRW, ECB, FAW, WBC**	RR2, LL	5% - adjacent