



# RECOMMENDED REFUGE CHOICES

DiFonzo & Cullen's Handy Bt Trait table Current April 1, 2012	Bt protein(s)	Insects controlled ( <b>bold</b> ) or suppressed ( <i>italics</i> ) Above-ground-----In soil	Herbicide tolerant?	Refuge %, location in the MIDWEST	
<b>Agrisure products</b>					
Agrisure CB/LL	Cry1Ab	<b>ECB</b> <i>CEW FAW SB</i>	---	LL 20% within ½ mile	
Agrisure GT/CB/LL	Cry1Ab	<b>ECB</b> <i>CEW FAW SB</i>	---	GT LL 20% within ½ mile	
Agrisure RW	mCry3A	---	<b>CRW</b>	---	20% in field/adjacent
Agrisure GT/RW	mCry3A	---	<b>CRW</b>	GT	20% in field/adjacent
Agrisure CB/LL/RW	Cry1Ab mCry3A	<b>ECB</b> <i>CEW FAW SB</i>	<b>CRW</b>	LL	20% in field/adjacent
Agrisure 3000GT	Cry1Ab mCry3A	<b>ECB</b> <i>CEW FAW SB</i>	<b>CRW</b>	GT LL	20% in field/adjacent
Agrisure Viptera 3110	Cry1Ab Vip3A	<b>BCW CEW</b> <b>ECB FAW WBC SB</b>	---	GT LL	20% within ½ mile
Agrisure Viptera 3111	Cry1Ab mCry3A Vip3A	<b>BCW CEW</b> <b>ECB FAW WBC SB</b>	<b>CRW</b>	GT LL	20% in field/adjacent
Agrisure 3122 Refuge Renew	Cry1Ab Cry1F mCry3A Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	<b>CRW</b>	GT LL	5% in field/adjacent
Agrisure Viptera 3220	Cry1Ab Cry1F Vip3A	<b>BCW CEW</b> <b>ECB FAW WBC SB</b>	---	GT LL	5% within ½ mile
<b>Herculex products</b>					
Herculex 1 (HX1)	Cry1F	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	---	LL RR2 (some)	20% within ½ mile
Herculex RW (HXRW)	Cry34/35Ab1	---	<b>CRW</b>	LL RR2 (some)	20% in field/adjacent
Herculex XTRA (HXX)	Cry1F Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW</i>	<b>CRW</b>	LL RR2 (some)	20% in field/adjacent
<b>Optimum products</b>					
Optimum® TR sect	Cry1F mCry3A	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	<b>CRW</b>	LL RR2	20% in field/adjacent
Optimum® Intrasect	Cry1F Cry1Ab	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	---	LL RR2	5% within ½ mile
Optimum® Intrasect Xtra	Cry1F Cry1Ab Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	<b>CRW</b>	LL RR2	20% in field/adjacent
Optimum® Intrasect Xtreme	Cry1F Cry1Ab mCry3A Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	<b>CRW</b>	LL RR2	5% in field/adjacent
Optimum® (AM-R) AcreMax	Cry1F Cry1Ab	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	---	RR2	5% <i>in the bag</i>
Optimum® (AMRW-R) AcreMax Rootworm	Cry34/35Ab1	---	<b>CRW</b>	RR2	10% <i>in the bag</i>
Optimum® (AM1) AcreMax1	Cry1F Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW</i>	<b>CRW</b>	LL RR2	10% <i>in the bag</i> (CRW) & 20% - ½ mile (ECB)
Optimum® (AMX-R) AcreMax Xtra	Cry1F Cry1Ab Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	<b>CRW</b>	RR2	10% <i>in the bag</i>
Optimum® (AMXT-R) AcreMax Xtreme	Cry1F Cry1Ab mCry3A Cry34/35Ab1	<b>BCW ECB FAW WBC</b> <i>CEW SB</i>	<b>CRW</b>	RR2	5% <i>in the bag</i>
<b>Genuity / SmartStax products</b>					
Genuity VT Double PRO (VT2P)	Cry1A.105 Cry2Ab2	<b>CEW ECB FAW</b>	---	RR2	5% within ½ mile
Genuity VT Double PRO Complete	Cry1A.105 Cry2Ab2	<b>CEW ECB FAW</b>	---	RR2	5% <i>in the bag</i>
Genuity VT Triple PRO (VT3P)	Cry1A.105 Cry2Ab2 Cry3Bb1	<b>CEW ECB FAW</b>	<b>CRW</b>	RR2	20% in field/adjacent
SmartStax (Dow) or Genuity SmartStax (Monsanto)	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34/35Ab1	<b>BCW CEW</b> <b>ECB FAW WBC</b>	<b>CRW</b>	LL RR2	5% in field/adjacent
Genuity SmartStax RIB Complete	Same as Smartstax	<b>BCW CEW ECB FAW</b> <b>WBC</b>	<b>CRW</b>	LL RR2	5% <i>in the bag</i>
REFUGE ADVANCED Powered by SmartStax	Same as Smartstax	<b>BCW CEW</b> <b>ECB FAW WBC</b>	<b>CRW</b>	LL RR2	5% <i>in the bag</i>

Chart was compiled by Entomologists Eileen Cullen from the University of Wisconsin and Chris DiFonzo from Michigan State University.



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### Key

BCW - black cutworm  
CEW - corn rootworm  
CRW - corn rootworm  
ECB - European corn borer  
FAW - fall army worm

SB - stalk borer  
WBC - western bean cutworm  
GT - glyphosate tolerant  
LL - LibertyLink or glufosinate tolerant  
RR2 - Roundup Ready 2