The Handy Bt Trait Table

for U.S. Corn Production

Updated December 2017

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Most corn hybrids planted in the U.S. have one or more transgenic traits for insect management. These traits can increase flexibility and profitability for producers, but can also cause confusion because of varying spectrum of control or refuge requirements. The Handy Bt Trait Table provides a helpful list of trait names (below) and details of trait packages (next page) to make it easier to understand company seed guides, sales materials, and bag tags.

New for 2018

- ✓ Trait packages are now alphabetized, instead of grouped by seed company.
- ✓ To make the trait table easier to read, the "Marketed for" and "Herbicide trait" columns were redesigned to replace letter abbreviations for insect names and herbicides with a simple 'X'.
- ✓ In 2017, we added a column listing insect x Bt combinations with documented field-failures, confirmed resistance, or cross-resistance in published lab assays &/or field research. For 2018, this column has the same format, but is relabeled "Resistance to a Bt protein in the trait package has developed in:". This column is intended to alert producers and consultants to potential management problems and encourage field scouting. Growers should check with local extension educators and seed dealers to determine the status of Bt resistance in their local area. Citations for cases of resistance are posted at the web site in the header of this bulletin.
- ✓ Note that based on strong evidence from lab assays and the field, companies removed western bean cutworm control from the Cry1F Bt protein (i.e., the Herculex trait). Only hybrids with the Vip3A Bt protein provide reliable control of this insect. For all other hybrid packages, western bean cutworm infestations should be managed using a combination of scouting and spraying at threshold.

Field corn 'events' (transformations of one or more genes) and their Trade Names

Trade name for trait	Event	Protein(s) expressed	Insect Target + *Herbicide Activity*
Agrisure CB/LL	Bt11	Cry1Ab + *PAT*	corn borer + *glufosinate tolerance*
Agrisure Duracade	5307	eCry3.1Ab	rootworm
Agrisure GT	GA21	*EPSPS*	*glyphosate tolerance*
Agrisure RW	MIR604	mCry3A	rootworm
Agrisure Viptera	MIR162	Vip3A	broad Lep control (but not corn borer)
Herculex I (HXI) or CB	TC1507	Cry1Fa2 + *PAT*	corn borer + *glufosinate tolerance*
Herculex CRW	DAS-59122-7	Cry34Ab1/Cry35Ab1 + *PAT*	rootworm + *glufosinate tolerance*
(None – part of Qrome)	DP-4114	Cry1F + Cry34Ab1/Cry35Ab1 + *PAT*	corn borer+rootworm+*glufosinate tol.*
Roundup Ready 2	NK603	*EPSPS*	*glyphosate tolerance*
Yieldgard Corn Borer	MON810	Cry1Ab	corn borer
Yieldgard Rootworm	MON863	Cry3Bb1	rootworm
Yieldgard VT Pro	MON89034	Cry1A.105 + Cry2Ab2	Lepidopteran control
Yieldgard VT Rootworm RR	MON88017	Cry3Bb1 + *EPSPS*	rootworm + *glyphosate tolerance*

Abbreviations used in the Trait Table

Herbicide traits

GT *glyphosate tolerant*
LL Liberty Link - *glufosinate-tolerant*
RR2 Roundup Ready 2, *glyphosate-tolerant*

Insect targets

BCW black cutworm
CEW corn earworm
CRW corn rootworm
ECB European corn borer
FAW fall armyworm
SB stalk borer
SCB sugarcane borer
SWCB southwestern corn borer
TAW true armyworm
WBC western bean cutworm

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Trait packages in alphabetical order (acronym)	Bt protein(s) in the trait package	Marketed for control of:										Resistance to a Bt protein in the trait package has developed in: *	Herbicide trait		Non-Bt Refuge % (cornbelt)
		BCW	CEW	ECB	FAW	SB	SCB	SWCB	TAW	WBC	CRW		GT RR2	LL	
AcreMax (AM)	Cry1Ab Cry1F	x		x	x	x	x	x				FAW WBC	x	x	5% in bag
AcreMax CRW (AMRW)	Cry34/35Ab1										x	CRW	x	x	10% in bag
AcreMax1 (AM1)	Cry1F Cry34/35Ab1	x		x	x	x	x	x			x	FAW SWCB WBC CRW	x	x	10% in bag 20% ECB
AcreMax Leptra (AML)	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x			x	x	5% in bag
AcreMax TRIsect (AMT)	Cry1Ab Cry1F mCry3A	x		x	x	x	x	x			x	FAW WBC CRW	x	x	10% in bag
AcreMax Xtra (AMX)	Cry1Ab Cry1F Cry34/35Ab1	x		x	x	x	x	x			x	FAW WBC CRW	x	x	10% in bag
AcreMax Xtreme (AMXT)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x			x	FAW WBC CRW	x	x	5% in bag
Agrisure 3010 and 3010A	Cry1Ab			x			x	x					x	x	20%
Agrisure 3000GT and 3011A	Cry1Ab mCry3A			x			x	x			x	CRW	x	x	20%
Agrisure Viptera 3110	Cry1Ab Vip3A	x	x	x	x	x	x	x	x	x			x	x	20%
Agrisure Viptera 3111	Cry1Ab Vip3A mCry3A	x	x	x	x	x	x	x	x	x	x	CRW	x	x	20%
Agrisure 3120 EZ Refuge	Cry1Ab Cry1F	x		x	x	x	x	x				FAW WBC	Depends on hybrid; see bag for code EZ0 (GT) or EZ1 (GT LL)		5% in bag
Agrisure 3122 EZ Refuge	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x			x	FAW WBC CRW			5% in bag
Agrisure Viptera 3220 EZ Refuge	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x					5% in bag
Agrisure Duracade 5122 EZ Refuge	Cry1Ab Cry1F mCry3A eCry3.1Ab	x		x	x	x	x	x			x	FAW WBC CRW			5% in bag
Agrisure Duracade 5222 EZ Refuge	Cry1Ab Cry1F Vip3A mCry3A eCry3.1Ab	x	x	x	x	x	x	x	x	x	x	CRW			5% in bag
Herculex I (HXI)	Cry1F	x		x	x	x	x	x				FAW SWCB WBC	x	x	20%
Herculex RW (HXRW)	Cry34/35Ab1										x	CRW	x	x	20%
Herculex XTRA (HXX)	Cry1F Cry34/35Ab1	x		x	x	x	x	x			x	FAW SWCB WBC CRW	x	x	20%
Intrasect (YHR)	Cry1Ab Cry1F	x		x	x	x	x	x				FAW WBC	x	x	5%
Intrasect TRIsect (CYHR)	Cry1Ab Cry1F mCry3A	x		x	x	x	x	x			x	FAW WBC CRW	x	x	20%
Intrasect Xtra (YXR)	Cry1Ab Cry1F Cry34/35Ab1	x		x	x	x	x	x			x	FAW WBC CRW	x	x	20%
Intrasect Xtreme (CYXR)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x			x	FAW WBC CRW	x	x	5%
Leptra (VYHR)	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x			x	x	5%
Powercore [a] Powercore Refuge Advanced [b]	Cry1A.105 Cry2Ab2 Cry1F	x	x	x	x	x	x	x				CEW WBC	x	x	[a] 5% [b] 5% in bag
QROME (Q)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x			x	FAW WBC CRW	x	x	5% in bag
SmartStax [a] Smartstax Refuge Advanced [b] SmartStax RIB Complete [b]	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW WBC CRW	x	x	[a] 5% [b] 5% in bag
Trecepta [a] Trecepta RIB Complete [b]	Cry1A.105 Cry2Ab2 Vip3A	x	x	x	x	x	x	x	x	x			x		[a] 5% [b] 5% in bag
TRIsect (CHR)	Cry1F mCry3A	x		x	x	x	x	x			x	FAW SWCB WBC CRW	x	x	20%
VT Double PRO [a] VT Double PRO RIB Complete[b]	Cry1A.105 Cry2Ab2		x	x	x	x	x	x				CEW	x		[a] 5% [b] 5% in bag
VT Triple PRO [c] VT Triple PRO RIB Complete [d]	Cry1A.105 Cry2Ab2 Cry3Bb1		x	x	x	x	x	x			x	CEW CRW	x		[c] 20% [d] 10% in bag
Yieldgard Corn Borer (YGCB)	Cry1Ab			x			x	x				SWCB	x		20%
Yieldgard Rootworm (YGRW)	Cry3Bb1										x	CRW	x		20%
Yieldgard VT Triple	Cry1Ab Cry3Bb1			x			x	x			x	SWCB CRW	x		20%

**Check with local extension educators and seed dealers to determine the status of Bt resistance in your particular region.*