

The Handy Bt Trait Table

for U.S. Corn Production

Updated March 2023

VOID

The most up-to-date version of this table plus related extension materials are free online at:

<https://www.texasinsects.org/bt-corn-trait-table.html>

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The Handy Bt Trait Table provides a helpful list of trait packages to make it easier to understand seed guides, sales materials, and bag tags.

The big change for 2023: The table increased from one to two pages. Companies renamed some of their trait stacks, introduced the dvSnf7 trait (RNAi technology) for rootworm control, or added Enlist 2,4-D/fops herbicide tolerance to existing hybrid packages. Each new combination and name increased the length of the table. Thus, the 2023 version flows over two pages. As a result of the extra space, font size increased in a few columns and a separate column was added for bag tag letter codes.

For those who need it, the table of 'transformation events' (on page 1 of previous versions) has moved online. Also new online: a *checklist of events x stacks*, plus a *list of EPA registration numbers* for the trait packages on the Handy Bt Trait Table. Visit the web link in the header.

I am often asked why older trait packages with limited or no commercial availability remain on the table. This is for historical reference, to interpret previous year's planting records, seed guides, and research results. Also, companies often refer to older trait stack names in current seed guides (e.g. 'AwesomeSeed's new XYZ-Pro is a combination of trait packages A, B, and C'). Thus, the Handy Bt Trait Table is a one-stop shop for both past and present Bt hybrid information.

ABBREVIATIONS in the TRAIT TABLE

Insect Pest Targets

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

Herbicide Tolerance

- GLY glyphosate / Roundup-Ready
- LL glufosinate / Liberty Link
- LL? check the bag tag for LL status
- 2,4D 2,4-D
- fops group 1 'fops'

Refuge

Unless specified as RIB (Refuge In Bag), all other percentages assume separate, structured refuge areas planted in strips, blocks, borders, or whole fields

Version: March 2023

| Trait packages A-Z = former name | Bag tag code | Toxins in package ***** Font type denotes target: caterpillar or rootworm | Marketed to control: | | | | | | | | | | | | Resistance cases for all Bts in package | Refuge, northern states (higher in south) | Herbicide tolerance (? = check the bag tag) | | |
|---|--------------|--|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|--|--|-------------------------|---------|
| | | | B | C | E | F | S | S | T | W | C | R | W | C | | | | | |
| | | | C | E | C | A | S | C | B | W | A | B | R | W | | | | C | W |
| AcreMax | AM | Cry1Ab - Cry1F | x | x | x | x | x | x | x | | | | | | | | CEW FAW WBC | 5% RIB | GLY LL |
| AcreMax1 | AM1 | Cry1F - Cry34Ab1 - Cry35Ab1 | x | | x | x | x | x | x | | | | | | x | | ECB FAW NCR SWCB WBC WCR | 10% RIB 20% ECB | GLY LL |
| AcreMax Leptra | AML | Cry1Ab - Cry1F - Vip3A | x | x | x | x | x | x | x | x | x | | | | | | | 5% RIB | GLY LL |
| AcreMax RW | AMRW | Cry34Ab1 - Cry35Ab1 | | | | | | | | | | | | | x | | NCR WCR | 10% RIB | GLY LL |
| AcreMax TRIsect | AMT | Cry1Ab - Cry1F - mCry3A | x | x | x | x | x | x | x | | | | | | x | | CEW FAW WBC WCR | 10% RIB | GLY LL |
| AcreMax Xtra | AMX | Cry1Ab - Cry1F - Cry34Ab1 - Cry35Ab1 | x | x | x | x | x | x | x | | | | | | x | | CEW FAW NCR WBC WCR | 10% RIB | GLY LL |
| AcreMax Xtreme | AMXT | Cry1Ab - Cry1F - Cry34Ab1 - Cry35Ab1 - mCry3A | x | x | x | x | x | x | x | | | | | | x | | CEW FAW WBC WCR | 5% RIB | GLY LL |
| Agrisure 3000GT | 3000GT | Cry1Ab - mCry3A | | x | x | | | x | x | | | | | | x | | CEW WCR | 20% | GLY LL |
| Agrisure 3010 =Agrisure GT/CB/LL | 3010 | Cry1Ab | | x | x | | | x | x | | | | | | | | CEW | 20% | GLY LL |
| Agrisure Above =Agrisure 3120EZ AA Refuge Renew =Agrisure 3120 | AA | Cry1Ab - Cry1F | x | x | x | x | x | x | x | | | | | | | | CEW FAW WBC | EZ: 5% RIB Renew: 5% | GLY LL? |
| Agrisure Total =Agrisure 3122EZ AT Refuge Renew =Agrisure 3122 | AT | Cry1Ab - Cry1F - Cry34Ab1 - Cry35Ab1 - mCry3A | x | x | x | x | x | x | x | | | | | | x | | CEW FAW WBC WCR | EZ: 5% RIB Renew: 5% | GLY LL? |
| Agrisure Viptera 3110 | 3110 | Cry1Ab - Vip3A | x | x | x | x | x | x | x | x | x | | | | | | | 20% | GLY LL |
| Agrisure Viptera 3111 | 3111 | Cry1Ab - Vip3A - mCry3A | x | x | x | x | x | x | x | x | x | x | | | | | WCR | 20% | GLY LL |

| Trait package = former name | Bag tag code | Toxins in package ***** Font type denotes target: caterpillar or rootworm | Marketed to control: | | | | | | | | | | | Resistance cases for all Bts in package | Refuge, northern states (higher in south) | Herbicide tolerance (? = check the bag tag) |
|--|--------------|--|----------------------|-------------|-------------|-------------|--------|-------------|------------------|-------------|-------------|-------------|---|---|--|--|
| | | | B C W | C E W | E C B | F A W | S B | S C B | S W C B | T A W | W B C | C R W | | | | |
| Duracade =Agrisure 5122EZ D Refuge Renew =Agrisure 5122 | D | Cry1Ab - Cry1F - eCry3.1Ab - mCry3A | x | x | x | x | x | x | x | x | | | x | CEW FAW WBC WCR | EZ: 5% RIB Renew: 5% | GLY LL? |
| Duracade Viptera =Agrisure 5222EZ DV Refuge Renew =Agrisure 5222 | DV | Cry1Ab - Cry1F - Vip3A - eCry3.1Ab - mCry3A | x | x | x | x | x | x | x | x | x | x | x | WCR | EZ: 5% RIB Renew: 5% | GLY LL? |
| Duracade Viptera Z3 =Agrsr 5332EZ DVZ Refuge Renew =Agrisure 5332 | DVZ | Cry1Ab - Cry1A.105 - Cry2Ab2 - Vip3A - eCry3.1Ab - mCry3A | x | x | x | x | x | x | x | x | x | x | x | WCR | EZ: 5% RIB Renew: 5% | GLY LL? |
| Herculex I | HXI | Cry1F | x | | x | x | x | x | x | x | | | | ECB FAW SWCB WBC | 20% | GLY LL |
| Herculex RW | HXRW | Cry34Ab1 - Cry35Ab1 | | | | | | | | | | | x | NCR WCR | 20% | GLY LL |
| Herculex XTRA | HXX | Cry1F - Cry34Ab1 - Cry35Ab1 | x | | x | x | x | x | x | x | | | x | ECB FAW NCR SWCB WBC WCR | 20% | GLY LL |
| Intrasect | YHR | Cry1Ab - Cry1F | x | x | x | x | x | x | x | | | | | CEW FAW WBC | 5% | GLY LL |
| Intrasect TRIsect | CYHR | Cry1Ab - Cry1F - mCry3A | x | x | x | x | x | x | x | | | | x | CEW FAW WBC WCR | 20% | GLY LL |
| Intrasect Xtra | YXR | Cry1Ab - Cry1F - Cry34Ab1 - Cry35Ab1 | x | x | x | x | x | x | x | | | | x | CEW FAW NCR WBC WCR | 20% | GLY LL |
| Intrasect Xtreme | CYXR | Cry1Ab - Cry1F - Cry34Ab1 - Cry35Ab1 - mCry3A | x | x | x | x | x | x | x | | | | x | CEW FAW WBC WCR | 5% | GLY LL |
| Leptra | VYHR | Cry1Ab - Cry1F - Vip3A | x | x | x | x | x | x | x | x | x | | | | 5% | GLY LL |
| Powercore | PW | Cry1A.105 - Cry2Ab2 - Cry1F | x | x | x | x | x | x | x | | | | | CEW WBC | 5% | GLY LL |
| Powercore Refuge Adv. | PWRA | Cry1A.105 - Cry2Ab2 - Cry1F | x | x | x | x | x | x | x | | | | | CEW WBC | 5% RIB | GLY LL |
| Powercore Enlist Refuge Adv. | PWE | Cry1A.105 - Cry2Ab2 - Cry1F | x | x | x | x | x | x | x | | | | | CEW WBC | 5% RIB | GLY LL 2,4-D fops |
| QROME | Q | Cry1Ab - Cry1F - Cry34Ab1 - Cry35Ab1 - mCry3A | x | x | x | x | x | x | x | | | | x | CEW FAW WBC WCR | 5% RIB | GLY LL |
| SmartStax & Genuity SmartStax | SS SX | Cry1A.105 - Cry2Ab2 - Cry1F - Cry3Bb1 - Cry34Ab1 - Cry35Ab1 | x | x | x | x | x | x | x | | | | x | CEW NCR WBC WCR | 5% | GLY LL |
| SmartStax Enlist | SSE | Same as SmartStax | x | x | x | x | x | x | x | | | | x | CEW NCR WBC WCR | 5% | GLY LL 2,4-D fops |
| SmartStax Enlist Refuge Adv. | | Same as SmartStax | x | x | x | x | x | x | x | | | | x | CEW NCR WBC WCR | 5% RIB | GLY LL 2,4-D fops |
| SmartStax Refuge Adv. or SmartsStax RIB Complete | SXRA | Same as SmartStax | x | x | x | x | x | x | x | | | | x | CEW NCR WBC WCR | 5% RIB | GLY LL |
| SmartStax PRO | | Cry1A.105 - Cry2Ab2 - Cry1F - Cry3Bb1 - Cry34Ab1 - Cry35Ab1 - dvSnf7 | x | x | x | x | x | x | x | | | | x | CEW WBC | 5% | GLY LL |
| SmartStax PRO Enlist | | Same as SmartStax Pro | x | x | x | x | x | x | x | | | | x | CEW WBC | 5% | GLY LL 2,4-D fops |
| SmartStax PRO Enlist Refuge Advanced | | Same as SmartStax Pro | x | x | x | x | x | x | x | | | | x | CEW WBC | 5% RIB | GLY LL 2,4-D fops |
| SmartStax PRO Refuge Adv. RIB Complete, or w/RNAi Tech | SSPro | Same as SmartStax Pro | x | x | x | x | x | x | x | | | | x | CEW WBC | 5% RIB | GLY LL |
| Trecepta RIB Complete | TRERIB | Cry1A.105 - Cry2Ab2 - Vip3A | x | x | x | x | x | x | x | x | x | | | | 5% RIB | GLY |
| TRIssect | CHR | Cry1F - mCry3A | x | | x | x | x | x | x | | | | x | ECB FAW SWCB WBC WCR | 20% | GLY LL |
| Viptera =Agrisure 3220EZ Vip Refuge Renew =Agrisure 3220 | V | Cry1Ab - Cry1F - Vip3A | x | x | x | x | x | x | x | x | x | | | | EZ: 5% RIB Renew: 5% | GLY LL? |
| Viptera Z3 =Agrisure 3330EZ VZ Refuge Renew =Agrisure 3330 | VZ | Cry1Ab - Cry1A.105 - Cry2Ab2 - Vip3A | x | x | x | x | x | x | x | x | x | | | | EZ: 5% RIB Renew: 5% | GLY LL? |
| Vorceed Enlist | V | Cry1A.105 - Cry2Ab2 - Cry1F - Cry3Bb1 - Cry34Ab1 - Cry35Ab1 - dvSnf7 | x | x | x | x | x | x | x | | | | x | CEW NCR WBC | 5% RIB | GLY LL 2,4-D fops |
| VT Double PRO | VT2P | Cry1A.105 - Cry2Ab2 | | x | x | x | x | x | x | | | | | CEW | 5% | GLY |
| VT2 PRO RIB Complete | VT2PRIB | Cry1A.105 - Cry2Ab2 | | x | x | x | x | x | x | | | | | CEW | 5% RIB | GLY |
| VT Triple PRO | VT3P | Cry1A.105 - Cry2Ab2 - Cry3Bb1 | | x | x | x | x | x | x | | | | x | CEW NCR WCR | 20% | GLY |
| VT3 PRO RIB Complete | VT3PRIB | Cry1A.105 - Cry2Ab2 - Cry3Bb1 | | x | x | x | x | x | x | | | | x | CEW NCR WCR | 10% RIB | GLY |
| VT4 PRO w/RNAi Tech. Expected 2024 | VT4PRO | Cry1A.105 - Cry2Ab2 - Vip3A - Cry3Bb1 - dvSnf7 | x | x | x | x | x | x | x | x | x | | | | 5% RIB | GLY |
| YieldGard Corn Borer | YGCB | Cry1Ab | | x | x | | | | x | x | | | | CEW | 20% | GLY |
| YieldGard Rootworm | YGRW | Cry3Bb1 | | | | | | | | | | | x | NCR WCR | 20% | GLY |
| YieldGard VT Triple | VT3 | Cry1Ab - Cry3Bb1 | | x | x | | | | x | x | | | x | CEW NCR WCR | 20% | GLY |