

How to use the Handy Bt Trait Table

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Disclaimer: examples in this slide set are given to demonstrate use of the Bt table, not to endorse any specific company, Bt trait, or hybrid

the Handy Bt Trait Table

- originally a local document, now used nationwide
- it's 'handy' because few sources compare all Bt trait packages in one document

The Handy Bt Trait Table

for U.S. Corn Production

The latest version of this document is always posted at <https://www.texasinsects.org/bt-corn-trait-table.html>
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 Contributor: Pat Porter, Texas A&M University (southern version of the table)

Updated
November
2018

Most corn hybrids planted in the U.S. have transgenic traits for insect management. The Handy Bt Trait Table provides a helpful list of trait names (below) and details of trait packages (over) to make it easier to understand company seed guides, sales materials, and bag tags.

New for 2019

- Recent mergers resulted in name changes for several seed companies. While your local seed rep may have a new business card, the names of trait packages remain the same, listed alphabetically on page 2.
- Bt Resistance* is arguably the most important issue facing growers, extension entomologists, and seed company agronomists. Problems continue to increase in regions where field failures were already found, and new cases of resistance are reported every season. To date, resistance is confirmed to all Bt toxins targeting western corn rootworm, particularly in the central corn belt. In the southern states, corn earworm and fall armyworm resistance is expanding, while Cry1F no longer controls western bean cutworm in the Great Lakes region. These species were once secondary to European corn borer in importance, but now they are of primary concern for many growers. It is critical to be up-to-date on resistance development in your local area so that you know the limitations of the Bt traits you plant.

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

| Trade name for trait | Event | Protein(s) expressed | Primary Insect Targets + Herbicide tolerance |
|------------------------|-------------|---------------------------------|--|
| Agrisure CB/LL | Bt11 | Cry1Ab + PAT | corn borer + glufosinate |
| Agrisure Duracade | 5307 | eCry3.1Ab | rootworm |
| Agrisure GT | GA21 | EPSPS | glufosinate |
| Agrisure RW | MIR604 | mCry3A | rootworm |
| Agrisure Viptera | MIR162 | Vip3A | broad caterpillar control, except for corn borer |
| Enlist | DAS40278 | aad-1 | 2,4-D herbicide detoxification |
| Herculex I (HXI) or CB | TC1507 | Cry1Fa2 + PAT | corn borer + glufosinate |
| Herculex CRW | DAS-59122-7 | Cry34Ab1/Cry35Ab1 + PAT | rootworm + glufosinate |
| (None – part of Qrome) | DP-4114 | Cry1F + Cry34Ab1/Cry35Ab1 + PAT | corn borer + rootworm + glufosinate |
| Roundup Ready 2 | NK603 | EPSPS | glufosinate |
| Yieldgard Corn Borer | MON810 | Cry1Ab | corn borer |
| Yieldgard Rootworm | MON863 | Cry3Bb1 | rootworm |
| Yieldgard VT Pro | MON89034 | Cry1A.105 + Cry2Ab2 | corn borer & several caterpillar species |
| Yieldgard VT Rootworm | MON88017 | Cry3Bb1 + EPSPS | rootworm + glufosinate |

Abbreviations used in the Trait Table

Herbicide traits

GT *glufosinate tolerant*

LL Liberty Link - *glufosinate-tolerant*

RR2 Roundup Ready 2, *glufosinate-tolerant*

Insect targets

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

Page 1 - Table of Events

= gene(s) inserted to create GMO corn hybrids

| Trade name for trait | Event | Protein(s) expressed | Primary Insect Targets + <i>Herbicide tolerance</i> |
|------------------------|-------------|---------------------------------|---|
| Agrisure CB/LL | Bt11 | Cry1Ab + PAT | corn borer + <i>glufosinate</i> |
| Agrisure Duracade | 5307 | eCry3.1Ab | rootworm |
| Agrisure GT | GA21 | EPSPS | <i>glyphosate</i> |
| Agrisure RW | MIR604 | mCry3A | rootworm |
| Agrisure Viptera | MIR162 | Vip3A | broad caterpillar control, except for corn borer |
| Enlist | DAS40278 | <i>aad-1</i> | <i>2,4-D herbicide detoxification</i> |
| Herculex I (HXI) or CB | TC1507 | Cry1Fa2 + PAT | corn borer + <i>glufosinate</i> |
| Herculex CRW | DAS-59122-7 | Cry34Ab1/Cry35Ab1 + PAT | rootworm + <i>glufosinate</i> |
| (None – part of Qrome) | DP-4114 | Cry1F + Cry34Ab1/Cry35Ab1 + PAT | corn borer + rootworm + <i>glufosinate</i> |
| Roundup Ready 2 | NK603 | EPSPS | <i>glyphosate</i> |
| Yieldgard Corn Borer | MON810 | Cry1Ab | corn borer |
| Yieldgard Rootworm | MON863 | Cry3Bb1 | rootworm |
| Yieldgard VT Pro | MON89034 | Cry1A.105 + Cry2Ab2 | corn borer & several caterpillar species |
| Yieldgard VT Rootworm | MON88017 | Cry3Bb1 + EPSPS | rootworm + <i>glyphosate</i> |

common name of the event

type of Bt in the GMO plant

insects controlled by the toxin

Page 1 - Abbreviations used in the Trait Table

Insect targets

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

**some insect may only occur in the north or south*

Herbicide traits

GT *glyphosate tolerant*

LL *Liberty Link - glufosinate-tolerant*

RR2 *Roundup Ready 2, glyphosate-tolerant*

Page 2 - the Trait Table

Grouped by trait package
- commercial names for combinations of events

- trait packages are listed alphabetically
- remaining columns provide info on the Bts in the trait package

The Handy Bt Trait Table for U.S. Corn Production, updated November 2018

| Trait packages in alphabetical order (acronym) | Bt protein(s) in the trait package | Marketed for control of: | | | | | | | | | | | Insects resistant to the combination of Bt proteins in the trait package | Herbicide trait | | Non-Bt Refuge % (cornbelt) |
|--|-------------------------------------|--------------------------|---|---|---|---|---|---|---|---|---|---|--|-----------------|----------------------|----------------------------|
| | | B | C | E | F | S | S | W | T | W | C | R | | GT | LL | |
| | | W | W | B | W | B | C | B | A | B | W | C | | W | RR2 | |
| 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 | 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 | | | CRW | x | x | 20% |
| Agrisure 3120 E-Z Refuge | Cry1Ab Cry1F | x | | x | x | x | x | x | | | | | FAW WBC | x | | 5% in bag |
| Agrisure 3122 EZ Refuge | Cry1Ab Cry1F mCry3A Cry34/35Ab1 | x | | x | x | x | x | x | | | | x | FAW WBC CRW | x | See bag tag for code | 5% in bag |
| Agrisure Viptera 3220 E-Z Refuge | Cry1Ab Cry1F Vip3A | x | x | x | x | x | x | x | x | | | | | x | | 5% in bag |
| Agrisure Viptera 3330 E-Z Refuge | Cry1Ab Vip3A Cry1A.105 + Cry2Ab2 | x | x | x | x | x | x | x | x | | | | | x | E20 NO | 5% in bag |
| Agrisure Duracade 5122 E-Z Refuge | Cry1Ab Cry1F mCry3A eCry3.1Ab | x | | x | x | x | x | x | | | | x | FAW WBC CRW | x | E21 | 5% in bag |
| Agrisure Duracade 5222 E-Z Refuge | Cry1Ab Cry1F Vip3A mCry3A eCry3.1Ab | x | x | x | x | x | x | x | x | x | | | CRW | x | YES | 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 | 5% |
| Powercore ^a | Cry1A.105 Cry2Ab2 | x | x | x | x | x | x | x | | | | | CEW WBC | x | x | ^a 5% |
| Powercore Refuge Advanced ^b | Cry1F | | | | | | | | | | | | | | | ^b 5% in bag |
| QRONE (Q) | Cry1Ab Cry1F mCry3A Cry34/35Ab1 | x | | x | x | x | x | x | | | | x | FAW WBC CRW | x | x | 5% in bag |
| SmartStax ^a | Cry1A.105 Cry2Ab2 | x | x | x | x | x | x | x | | | | x | CEW WBC CRW | x | x | ^a 5% |
| SmartStax Refuge Advanced ^b | Cry1F Cry3Bb1 | | | | | | | | | | | | | | | ^b 5% in bag |
| SmartStax RIB Complete ^a | Cry34/35Ab1 | | | | | | | | | | | | | | | |
| Trecepta ^a | Cry1A.105 Cry2Ab2 | x | x | x | x | x | x | x | x | | | | | x | | ^a 5% |
| Trecepta RIB Complete ^b | Vip3A | | | | | | | | | | | | | | | ^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 | Cry1A.105 Cry2Ab2 | | | x | x | x | x | x | | | | | CEW | x | | ^a 5% |
| VT Double PRO RIB Complete ^b | | | | | | | | | | | | | | | | ^b 5% in bag |
| VT Triple PRO ^a | Cry1A.105 Cry2Ab2 | | | x | x | x | x | x | | | | x | CEW CRW | x | | ^a 20% |
| VT Triple PRO RIB Complete ^a | Cry3Bb1 | | | | | | | | | | | | | | | ^a 10% in bag |
| Yieldgard Corn Borer (YGCB) | Cry1Ab | | | x | | | | x | | | | | | x | | 20% |
| Yieldgard Rootworm (YGRW) | Cry3Bb1 | | | | | | | | | | | x | CRW | x | | 20% |
| Yieldgard VT Triple | Cry1Ab Cry3Bb1 | | | x | | | | x | x | | | x | CRW | x | | 20% |

Trait packages are a bit like insecticide names

| <u>chemical</u> <u>formula</u> | <u>active</u> <u>ingredient</u> | <u>Trade</u> <u>name</u> | <u>specific</u> <u>formulations</u> |
|---|------------------------------------|-----------------------------|--|
| $C_{23}H_{22}ClF_3O_2$ | bifenthrin | Brigade | Brigade 2EC Brigade WSB |
| $C_9H_{11}Cl_3NO_3PS$ | chlorpyrifos | Lorsban | Lorsban 15G Lorsban Adv. |
| combination product: bifenthrin + chlorpyrifos | | Hero | Hero Hero EW |

| <u>Bt</u> <u>event</u> | <u>Bt</u> <u>protein</u> | <u>Trait</u> <u>package</u> | <u>specific</u> <u>hybrids</u> <u>(many)</u> |
|--|-----------------------------|--------------------------------|--|
| TC1505 | Cry1F | Herculex 1 | P1498EHR |
| DAS-59122-7 | Cry34/35Ab1 | Herculex RW | P0448 AMRW |
| combination products: Cry1F + Cry34/35Ab1 | | AcreMax1 Herculex Xtra | P0905EXR P0533EXR |

**Trait packages in
alphabetical order
(acronym)**

AcreMax (AM)

AcreMax CRW (AMRW)

AcreMax1 (AM1)

AcreMax Leptra (AML)

AcreMax TRIssect
(AMT)

AcreMax Xtra
(AMX)

AcreMax Xtreme
(AMXT)

Agrisure 3010 and 3010A

Agrisure 3000GT and 3011A

Column 1:

Official names of the
trait packages and
their **(acronyms)**

- used in seed guides,
company materials,
bag tags, field signs

| Bt protein(s) in the trait package |
|------------------------------------|
| Cry1Ab Cry1F |
| Cry34/35Ab1 |
| Cry1F Cry34/35Ab1 |
| Cry1Ab Cry1F Vip3A |
| Cry1Ab Cry1F mCry3A |
| Cry1Ab Cry1F Cry34/35Ab1 |
| Cry1Ab Cry1F mCry3A Cry34/35Ab1 |
| Cry1Ab |
| Cry1Ab mCry3A |

Column 2

Bt proteins expressed in each trait package

- can compare among hybrids, determine which have the same Bt protein
- this is important for **resistance management**

Marketed for control of:

| | C | E | F | S | S | W | T | W | C |
|---|---|---|---|---|---|---|---|---|---|
| B | | | | | | | | | |
| C | | | | | | | | | |
| W | | | | | | | | | |
| X | | X | X | X | X | X | | | |
| | | | | | | | | | X |
| X | | X | X | X | X | X | | | X |
| X | X | X | X | X | X | X | X | X | |
| X | | X | X | X | X | X | | | X |
| X | | X | X | X | X | X | | | X |
| | | X | | | X | X | | | |
| | | X | | | X | X | | | X |

Column 3

insect targets controlled by the Bts, as claimed by the companies



Insects resistant to the combination of Bt proteins in the trait package

FAW WBC

CRW

FAW SWCB WBC
CRW

FAW WBC CRW

FAW WBC CRW

FAW WBC CRW

CRW

Column 4

Information on Bt resistance

- lists insects which are resistant to all of the Bts in the trait package, documented in lab assays or field studies
- resistance citations posted online with the Bt trait table



- resistance may be local, regional, or widespread
- check w/ local extension or seed dealer



western
corn
rootworm

examples:



western
bean
cutworm

Resistant to:

- Cry3Bb1 (YieldGard rootworm)
- mCry3A (Agrisure RW)
- Cry34/35Ab1 (Herculex RW)

Where?

- states in the central Plains
- isolated fields elsewhere

Resistant to:

- Cry1F
(Herculex 1)

Where?

- everywhere

Herbicide trait

Column 5

Herbicide tolerance

- Important if LL is not part of package

GT
RR2 LL

X X

X X

examples of single herbicide packages



| | | | | | | | | | | | | | | | |
|--------------------------------------|--|---|---|---|---|---|---|---|---|---|---|----------------|---|----------------------------------|------------|
| Agrisure 3120 E-Z Refuge | Cry1Ab Cry1F | x | | x | x | x | x | x | | | | FAW WBC | x | See bag tag for code | |
| Agrisure 3122 EZ Refuge | Cry1Ab Cry1F mCry3A Cry34/35Ab1 | x | | x | x | x | x | x | | | x | FAW WBC CRW | x | | |
| Agrisure Viptera 3220 E-Z Refuge | Cry1Ab Cry1F Vip3A | x | x | x | x | x | x | x | x | x | | | x | | |
| Agrisure Viptera 3330 E-Z Refuge | Cry1Ab Vip3A Cry1A.105 + Cry2Ab2 | x | x | x | x | x | x | x | x | x | | | x | | EZ0 NO |
| Agrisure Duracade 5122 E-Z Refuge | Cry1Ab Cry1F mCry3A eCry3.1Ab | x | | x | x | x | x | x | | | x | FAW WBC CRW | x | | EZ1 YES |
| Agrisure Duracade 5222 E-Z Refuge | Cry1Ab Cry1F Vip3A mCry3A eCry3.1Ab | x | x | x | x | x | x | x | x | x | x | CRW | x | | |

| | | | | | | | | | | | | | | |
|------------------------------------|-------------------|---|---|---|---|---|---|---|---|--|--|--|---|--|
| Trecepta ^a | Cry1A.105 Cry2Ab2 | x | x | x | x | x | x | x | x | | | | x | |
| Trecepta RIB Complete ^b | Vip3A | | | | | | | | | | | | | |



Column 6

Refuge requirement

- most but not all hybrids are now RIB, Refuge In the Bag
- Note this refuge is for the **corn belt** % refuge is higher in southern cotton-growing areas

Non-Bt
Refuge %
(cornbelt)

5% in bag

10% in bag

10% in bag
20% ECB

5% in bag

10% in bag

10% in bag

5% in bag

20%

20%

PLANT YOUR REFUGE.





Practical uses of the Trait Table

Seed selection: comparing hybrids in long lists

2015-2016

PIONEER® BRAND PRODUCTS FOR FOOD CORN PROCESSING



This is the North America **Yellow Food Corn (YFC)** and **White Food Corn (WH)** list of Pioneer® brand products. DuPont Pioneer began developing superior food-grade corn hybrids over fifty years ago. ALL Pioneer food-grade products are characterized for traits that food processors demand, such as kernel texture, color, size, and ear rot diseases (Fusarium, Gibberella, Diplodia). Please check with your local authorized Pioneer sales professional for availability of specific products from this list in your local area.

FOOD-GRADE YELLOW (YFC) AND HARD TEXTURED PRODUCTS

| Pioneer® Hybrid/Brand™ | Technology Segment | CRM | Pioneer® Hybrid/Brand™ | Technology Segment | CRM | Pioneer® Hybrid/Brand™ | Technology Segment | CRM | Pioneer® Hybrid/Brand™ | Technology Segment | CRM |
|------------------------|--------------------|-----|------------------------|--------------------|-----------|------------------------|--------------------|-----------------|------------------------|--------------------|-----|
| 38M58 | HX1,LL,RR2 | 94 | 33W80 | RR2 | 111 | P1443AM™* | AM,LL,RR2 | 114 | P1751AM™** | AMT,LL,RR2 | 117 |
| P0297AM1™ | AM1,LL,RR2 | 102 | 33W88AM1™ | AM1,LL,RR2 | | P1443YHR* | YGCB,HX1,LL,RR2 | | P1751AM™** | AM,LL,RR2 | |
| P0297AMXT™ | AMXT,LL,RR2 | | P1105* | | P1456HR | HX1,LL,RR2 | 114 | 32B34 | HX1,LL,RR2 | 118 | |
| P0297AMX™ | AMX,LL,RR2 | | P1105AM™ | AM,LL,RR2 | P1498 | | 114 | P1883AM™ | AM,LL,RR2 | 118 | |
| P0302CHR | RW,HX1,LL,RR2 | 103 | P1105AMX™ | AMX,LL,RR2 | P1498AM1™ | AM1,LL,RR2 | | P1883R | RR2 | | |
| P0407AMXT™ | AMXT,LL,RR2 | 104 | P1105R | RR2 | P1498AM™ | AM,LL,RR2 | | P1883YHR | YGCB,HX1,LL,RR2 | | |
| P0448 | | 104 | P1105YHR | YGCB,HX1,LL,RR2 | P1498CHR | RW,HX1,LL,RR2 | | 114 | 31G65 | RR2 | 119 |
| P0448AM1™ | AM1,LL,RR2 | | P1168AMX™ | AMX,LL,RR2 | 111 | P1498HR | | HX1,LL,RR2 | 31G70 | HXX,LL,RR2 | |
| P0448AMRW™ | AMRW,LL,RR2 | | P1184 | | 111 | P1498R | | RR2 | 31G71 | HX1,LL,RR2 | |
| P0448AMX™ | AMX,LL,RR2 | | P1184AM1™ | AM1,LL,RR2 | | P1498YHR | | YGCB,HX1,LL,RR2 | 31N26 | RR2 | |
| P0448HR | HX1,LL,RR2 | | P1184AMRW™ | AMRW,LL,RR2 | 32T16 | | | 115 | 31N27 | | 119 |
| P0448R | RR2 | | P1184AM™ | AM,LL,RR2 | 33D42 | RW,HX1,LL,RR2 | | | P1916YHR* | YGCB,HX1,LL,RR2 | |
| 35F37 | RR2 | | P1184R | RR2 | 33D47 | RR2 | | | P1944HR | HX1,LL,RR2 | 119 |
| 35F38 | | | P1184YHR | YGCB,HX1,LL,RR2 | 33D49 | HX1,LL,RR2 | P2160YHR* | YGCB,HX1,LL,RR2 | 121 | | |

YGCB Yieldgard corn borer
 HX1 Herculex 1
 LL RR2 Liberty Link & Roundup Ready

HX1 Herculex 1
 LL RR2 Liberty Link & Roundup Ready

Understanding an invoice: what seed was ordered and/ or delivered

AMXT hybrids = AcreMax Xtreme

- pyramids for Leps, CRW
- 5% RIB
- LL and RR2

R hybrid

- non-Bt refuge for CHR hybrids
- it is only Roundup Ready

CHR hybrids = TRIsect

- single Bts for Leps, CRW
- 20% structured refuge
- LL and RR2

AMT hybrids = AcreMax TRIsect

- pyramid for Leps, single Bt for CRW
- 10% RIB
- LL and RR2

| Product | Segment | Sub-Product Description |
|----------------------------|---------------|-------------------------|
| P1311AMXT | AMXT/LL/RR2 | NW84 MR 40 H IST V RA |
| P1311AMXT | AMXT/LL/RR2 | NW61 PDR 50 H IST V R |
| P1311AMXT | AMXT/LL/RR2 | NW01 PDR 80 H IST V R |
| P1602R | RR2 | NW01 PDR 80 H IST V R |
| P1690CHR | RW/HX1/LL/RR2 | NW62 PDF 50 H IST V R |
| P1690CHR | RW/HX1/LL/RR2 | NW01 PDR 80 H IST V R |
| P1751AMT | AMT/LL/RR2 | NW81 PDR 40 H IST V R |
| P1751AMT | AMT/LL/RR2 | NW61 PDR 50 H IST V R |
| P1751AMT | AMT/LL/RR2 | NW01 PDR 80 H IST V R |
| Corn Total | | |
| Gross Invoice Value | | |

DKC46-61RIB BRAND (GENSS)

RELATIVE MATURITY: OVERALL -96

GROWING DEGREE UNITS MID-POLLINATION: 1240

BLACK LAYER: 2350

LOT NO. 762PTK7JX

ORIGIN GERM DATE TESTED

VARIETY A1020470: 94.00 % MI 95% 01/12

VARIETY A1023398: 5.00 % IL 95% 11/11

INERT MATTER: 0.40 %

WEED SEED: 0.00 %

OTHER CROP SEED: 0.60 %

NOXIOUS WEEDS/LB: NONE SUGGESTED PLATE:

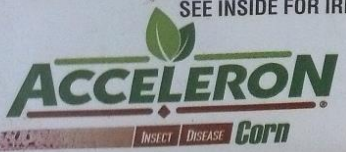
KIND: FIELD CORN JD B7

TRTMT: WAIH1 CIH C7

The seed in this container consists of the two identified field corn varieties. It is a Mixture under the state laws of AL, AK, AZ, CT, DE, FL, GA, ID, IL, KS, LA, KY, MA, MD, MS, NC, NE, NJ, NV, NY, OK, OR, TN, UT, WV and WI, and a Blend under the state laws of IN, HI, MI, MN, ND, OH, PA and WA. This is a product of MONSANTO's research program offering unique genetic characteristics for specific grower needs and protected by U.S. patent(s) : PENDING.



SEE INSIDE FOR IRM INFORMATION



A250

Understanding bag-tags

SmartStax tag

- this hybrid is a pyramid of Bts for both LepS and CRW
- It controls most LepS, but NOT western bean cutworm
- 'RIB Complete' means the 5% refuge is in the bag



Understanding signs at field days, in demonstration plots or along the roadside

Agrisure 3220 trait package

- a pyramid of Bts for leps
Cry1Ab + Cry1F + Vip3A
- 5% refuge in the bag

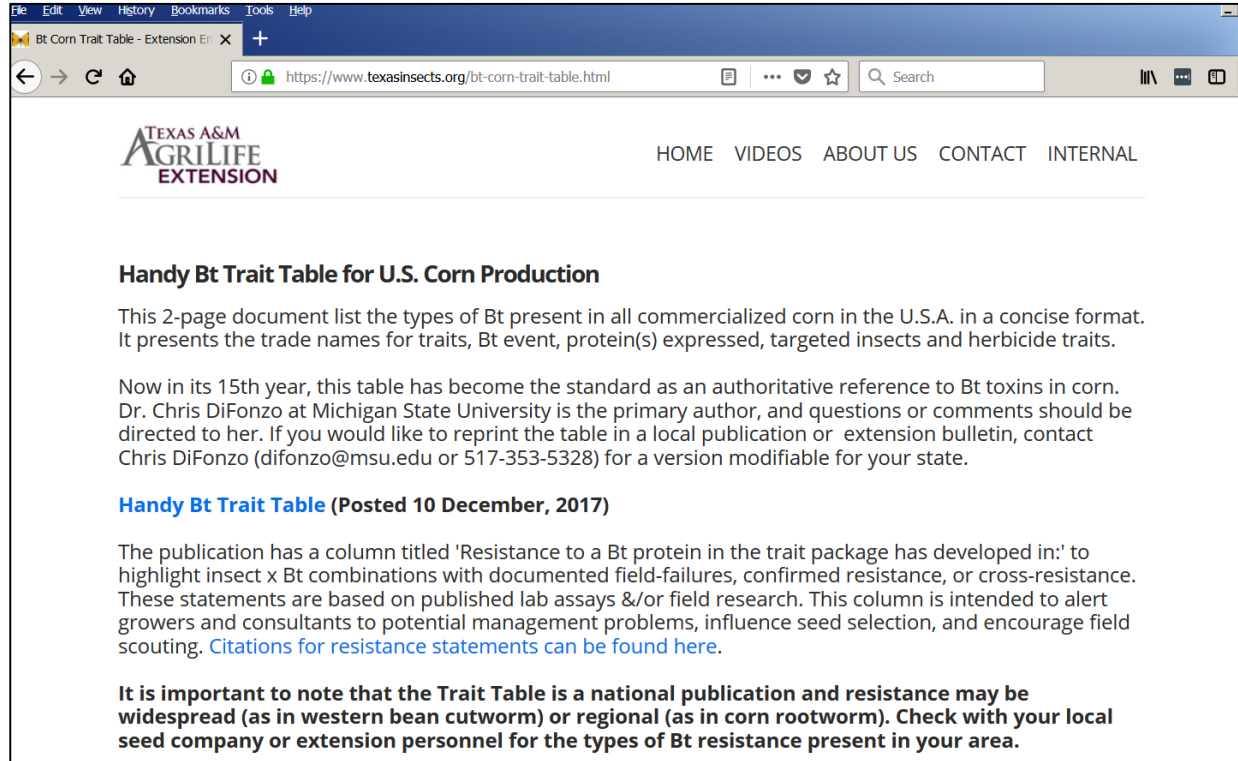
As a **Viptera** event, this hybrid should control western bean cutworm



To view/ download the trait table:

www.texasinsects.org/bt-corn-trait-table.html

The version
on this site
is always the
latest....



The screenshot shows a web browser window with the URL <https://www.texasinsects.org/bt-corn-trait-table.html>. The page header includes the Texas A&M Agrilife Extension logo and navigation links: HOME, VIDEOS, ABOUT US, CONTACT, INTERNAL. The main content area features the following text:

Handy Bt Trait Table for U.S. Corn Production

This 2-page document list the types of Bt present in all commercialized corn in the U.S.A. in a concise format. It presents the trade names for traits, Bt event, protein(s) expressed, targeted insects and herbicide traits.

Now in its 15th year, this table has become the standard as an authoritative reference to Bt toxins in corn. Dr. Chris DiFonzo at Michigan State University is the primary author, and questions or comments should be directed to her. If you would like to reprint the table in a local publication or extension bulletin, contact Chris DiFonzo (difonzo@msu.edu or 517-353-5328) for a version modifiable for your state.

Handy Bt Trait Table (Posted 10 December, 2017)

The publication has a column titled 'Resistance to a Bt protein in the trait package has developed in:' to highlight insect x Bt combinations with documented field-failures, confirmed resistance, or cross-resistance. These statements are based on published lab assays &/or field research. This column is intended to alert growers and consultants to potential management problems, influence seed selection, and encourage field scouting. [Citations for resistance statements can be found here.](#)

It is important to note that the Trait Table is a national publication and resistance may be widespread (as in western bean cutworm) or regional (as in corn rootworm). Check with your local seed company or extension personnel for the types of Bt resistance present in your area.