

# Develop corn rootworm performance and yield data with Aztec HC applied to refuge and Bt rootworm trait corn hybrids

UNL – South Central Agricultural Laboratory

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Background information pertaining to above experiments conducted near Harvard, NE, 2016

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## AGRONOMIC:

Row Spacing:	30 inches
Row Orientation:	North-South
Planting Date:	May 12, 2016
Planter:	4-row Kinze plot planter with finger pickup units
Hybrids:	DeKalb DKC60-69RIB (VT2PRIB, CRW refuge), DeKalb DKC60-67RIB (GENSSRIB), DeKalb DKC62-97RIB (VT3PRIB), Pioneer P0987 (AcreMax Xtra), Pioneer P0801 (AcreMax Xtreme)
Planting Depth:	2½ inches
Target Seeding Rate:	32,100 seeds per acre
Previous Crop:	Late planted corn and pumpkins
Soil Information:	<i>Soil type:</i> Crete silt loam <i>Soil Drainage:</i> Good <i>Soil Texture:</i> % Sand: 15, % Silt: 56, % Clay: 29 <i>Soil pH:</i> 6.5 <i>% Organic Matter:</i> 3.0 <i>Sum of Cations:</i> 14.2 me/100g <i>Tillage type:</i> Reduced, planted into established ridge/row.
Insecticide Applications:	<u>Granular Products-</u> Aztec HC granules (Trt #2, #4, #6, #8 and #10) were applied @ 1.5 oz/1000 row ft via the SmartBox application system and directed into the open seed furrow in front of the press wheels.
Herbicides Applied:	<i>Broadcasted:</i> RoundUp PowerMax @ 32 fl oz/A on May 4, 2016. <i>Broadcasted:</i> Acuron @ 2.5 Qt/A on May 12, 2016. <i>Broadcasted:</i> RoundUp PowerMax @ 26 fl oz/A on May 26, 2016 and June 14, 2016 to control volunteer corn.
Fertilizer Applied:	220 lbs nitrogen/A applied in the form of anhydrous ammonia in April 2016.

## **EXPERIMENTAL DESIGN:**

Design: Randomized complete block; replicated four times  
Plot Size: 4 rows x 69-75 ft length

## **ENVIRONMENTAL:**

Conditions at planting:

Wind direction and speed: NW @ 12-15 mph

Soil surface condition: Excellent

Subsoil moisture: Excellent-Moist

## **DATA COLLECTION:**

Plant Populations: The total number of corn plants in the center two rows of each plot was recorded on June 3, 2016 and converted to plants per acre (PPA).

Extended Leaf Heights: The extended leaf height (inches) of twenty random plants from the center two rows in each plot was recorded on June 20, 2016.

Harvest Evaluations: Plots were machine harvested on October 12, 2016. Pounds of grain and % moisture levels were recorded and converted to bushels per acre at 56 lbs/bu and 15.5% moisture.

## **ENTOMOLOGICAL DATA:**

Species present: Natural infestation of western corn rootworm, *Diabrotica virgifera virgifera* LeConte.

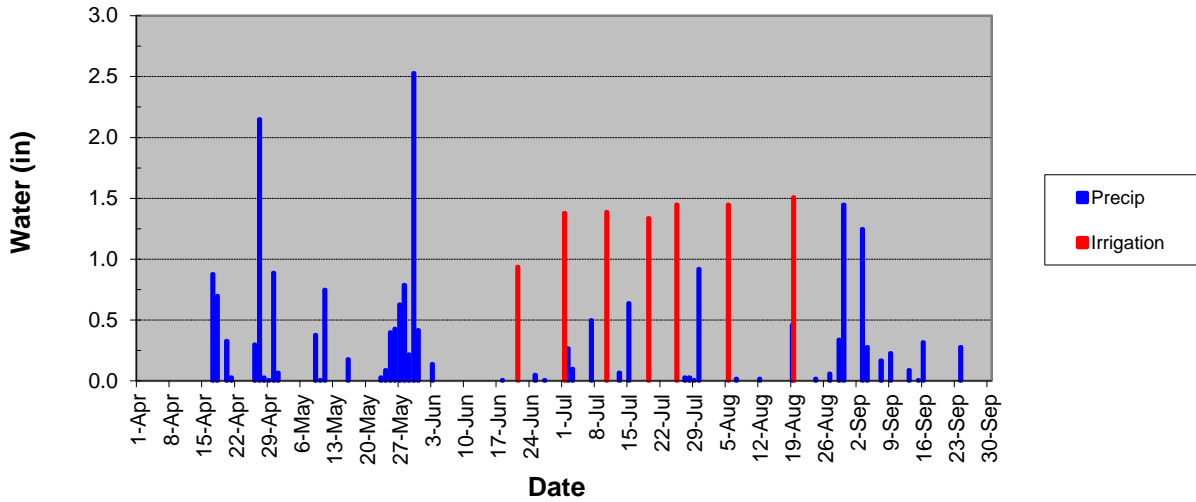
Egg Hatch: Initial egg hatch confirmed on June 2, 2016.

Adult Emergence: Initial adult western corn rootworm emergence witnessed on June 27, 2016.

Root Lodging, Broken and Dead Plant Evaluations: The total number of root lodged and dead plants due to larval corn rootworm feeding in the center two rows of each plot was recorded on July 19, 2016 and converted to percentage root lodged and dead plants per plot. In addition, the total number of broken plants in the center two rows of each plot (due to a high wind event on July 7) was also recorded on July 19, 2016 and converted to percentage broken plants per plot.

Root Injury Ratings: Five plants per plot (3 from row 1 and 2 from row 4) were dug and rated using the Iowa 0-3 root injury rating scale on July 26, 2016.

**Apr. 1 - Sept. 30 Growing Season Rainfall & Irrigation**  
**SCAL HOBO Weather Station**  
**(20.54 in. rain - 89% of normal and 9.46 in. irrigation)**



<u>Month</u>	<u>HOBO Weather Station</u> <u>2016 Precip</u>	<u>30-yr</u> <u>Average</u>	<u>% Avg.</u>
Jan	0.19	0.59	32
Feb	0.08	0.68	12
Mar	0.24	1.90	13
April	5.32	2.53	210
May	6.93	4.41	157
June	0.21	3.90	5
July	2.57	3.60	71
Aug	2.37	3.20	74
Sept	<u>2.63</u>	<u>2.36</u>	<u>111</u>
<b>Total&gt;&gt;</b>	<b>20.54</b>	<b>23.17</b>	<b>88.6</b>

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Corn Hybrid/ Trait Package	Insecticide Product	Yield <sup>1</sup> (bu/acre)	Iowa 0-3 Root Ratings <sup>1</sup>	% Consistency Iowa 0-3 Scale ≤ 0.25 <sup>1,3</sup>	% Root Lodging <sup>1</sup>	% Dead Plants <sup>2</sup>	% Broken Plants <sup>2</sup>	Extended Leaf Height <sup>1</sup> (inches)	PPA <sup>2</sup>
DKC62-97RIB/VT3PRIB	Aztec HC	245.1 a	0.11 a	95 a	0.8 ab	0.1	0.5	31.4 bc	32,168
DKC60-67RIB/GENSSRIB	-----	244.8 a	0.16 a	90 ab	3.0 b	0.1	0.4	31.6 bc	31,496
DKC60-67RIB/GENSSRIB	Aztec HC	244.0 a	0.09 a	100 a	1.5 ab	0.0	1.6	32.3 ab	32,086
DKC62-97RIB/VT3PRIB	-----	243.3 a	0.26 a	75 b	6.4 c	0.1	0.8	32.2 ab	31,076
P0801/AcreMax Xtreme	Aztec HC	239.5 a	0.12 a	100 a	0.9 ab	0.0	0.2	32.9 a	32,123
DKC60-69RIB/VT2PRIB	Aztec HC	238.4 ab	0.17 a	95 a	0.7 ab	0.0	0.6	30.6 c	32,137
P0801/AcreMax Xtreme	-----	234.0 ab	0.15 a	95 a	1.8 ab	0.0	0.3	32.6 a	31,747
P0987/AcreMax Xtra	Aztec HC	215.5 cd	0.13 a	95 a	0.2 a	0.0	0.6	29.1 d	30,498
P0987/AcreMax Xtra	-----	209.9 d	0.15 a	90 ab	2.6 ab	0.0	0.1	29.1 d	30,996
DKC60-69RIB/VT2PRIB (refuge)	-----	224.7 bc	1.02 b	45 c	6.9 c	0.1	0.0	29.1 d	31,726
<b>Treatment Probability</b>		<b>&lt;0.0001</b>	<b>0.0002</b>	<b>0.0006</b>	<b>&lt;0.0001</b>	<b>0.7318</b>	<b>0.4620</b>	<b>&lt;0.0001</b>	<b>0.1073</b>

<sup>1</sup>Means in column followed by the same lowercase letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

<sup>2</sup>Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

<sup>3</sup>Averages were converted by the angular transformation of percentages to degrees, before MIXED, original percentages are reported.