

Evaluate 3RIVE and LFR products for rootworm control in GMO rootworm field corn

UNL – South Central Agricultural Laboratory

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

AGRONOMIC:

Row Spacing:	30 inches
Row Orientation:	North-South
Planting Date:	May 6, 2016
Planter:	2-row JD 7100 Maximerge planter with finger pickup units
Hybrids:	DeKalb DKC60-67RIB Blend (GENSSRIB) and DKC60-69RIB Blend (GENDGVT2PRIB)
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: % Sand:</i> 15, <i>% Silt:</i> 56, <i>% Clay:</i> 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>Foam Products-</u> Foam formulations (Trt #1) were directed into the open seed furrow in front of the press wheels via the 3RIVE system. <u>Liquid Products-</u> Liquid formulations (Trt #2, #3, #4 and #5) were directed into the open seed furrow in front of the press wheels via a 5 GPA rate of 8-24-0 starter fertilizer at planting. <u>Granular Products-</u> Insecticide granules (Trt #6) were applied 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 11, 2016.

Broadcasted: 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 70-72 ft length

ENVIRONMENTAL:

Conditions at planting:

Wind direction and speed: S @ 15-18 mph

Soil surface condition: Excellent

Subsoil moisture: Excellent

DATA COLLECTION:

Plant Populations: The total number of corn plants in the center two rows of each plot was recorded on June 13, 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 10, 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.

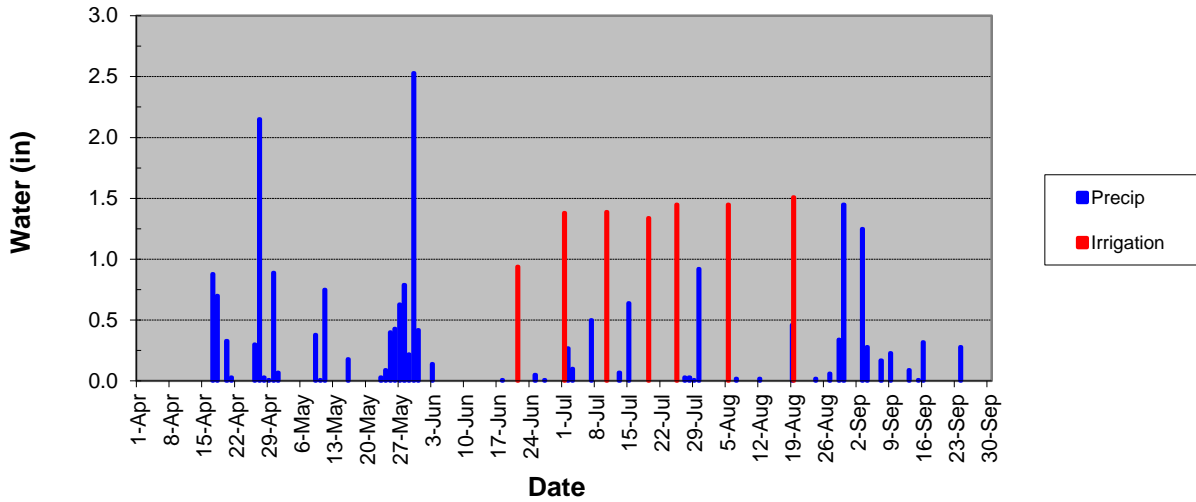
Egg Hatch: Initial egg hatch confirmed on June 2, 2016.

Adult Emergence: Initial adult 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 12, 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 12, 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 27, 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 2016 Precip</u>	<u>30-yr 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>
Total>>	20.54	23.17	88.6

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Insect Traits	Product(s)	Rate of Product (/acre)	Yield ¹ (bu/acre)	Iowa 0-3 Root Ratings ¹	% Root Lodging ¹	% Dead Plants ²	% Broken Plants ²	Extended Leaf Height ¹ (inches)	PPA ²
GENSSRIB	F4022-1	8.0 fl oz	249.8 a	0.13 a	1.7 a	0.0	0.7	41.2 a	33,194
GENSSRIB	Ethos XB	8.5 fl oz	246.7 a	0.08 a	0.6 a	0.0	0.4	40.7 ab	32,445
GENSSRIB	Capture 3RIVE 3D	8.0 fl oz	246.2 a	0.08 a	0.7 a	0.0	0.2	39.8 bc	32,886
GENSSRIB	Ethos LFR	9.5 fl oz	245.8 a	0.08 a	0.9 a	0.0	0.7	41.5 a	33,185
GENSSRIB	Force 3G	4.4 lbs	245.5 a	0.08 a	0.5 a	0.0	0.4	39.6 c	32,925
GENSSRIB	Capture LFR	8.5 fl oz	244.9 a	0.09 a	1.2 a	0.0	1.2	41.0 a	32,796
GENSSRIB	-----	-----	244.7 a	0.11 a	1.1 a	0.0	0.2	39.0 c	32,958
GENDGVT2PRIB	-----	-----	219.4 b	1.32 b	47.6 b	0.1	0.4	36.6 d	32,732
<i>Treatment Probability</i>			0.0002	<0.0001	<0.0001	0.4586	0.4855	<0.0001	0.9187

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

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