Evaluation of liquid and granular insecticide formulations compared to commercial standards for corn rootworm control

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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 7, 2016
Planter:	2-row JD 7100 Maximerge planter with finger pickup units
Hybrids:	DeKalb DKC62-78RIB (VT2PRIB)
Planting Depth:	2½ inches
Target Seeding Rate:	35,700 seeds per acre
Previous Crop:	Late planted corn and pumpkins
Soil Information:	*Soil type*: Crete silt loam *Soil Drainage*: Good *Soil Texture*: *% Sand*: 15, *% Silt*: 56, *% Clay*: 29 *Soil pH*: 6.5 *% Organic Matter*: 3.0 *Sum of Cations*: 14.2 me/100g *Tillage type*: Reduced, planted into established ridge/row.
Insecticide Applications:	Liquid Products- Liquid formulations (Trt #2, #3, and #4) were directed into the open seed furrow in front of the press wheels in a 5 GPA water solution at planting. Granular Products- Insecticide granules (Trt #5, #6, and #7) were applied via the SmartBox application system and directed into the open seed furrow in front of the press wheels.
Herbicides Applied:	*Broadcasted*: RoundUp PowerMax @ 32 fl oz/A on May 4, 2016. *Broadcasted:* 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 70-76 ft length

ENVIRONMENTAL:

Conditions at planting:

Wind direction and speed: SE-NE @ 6-13 mph

Soil surface condition: Excellent

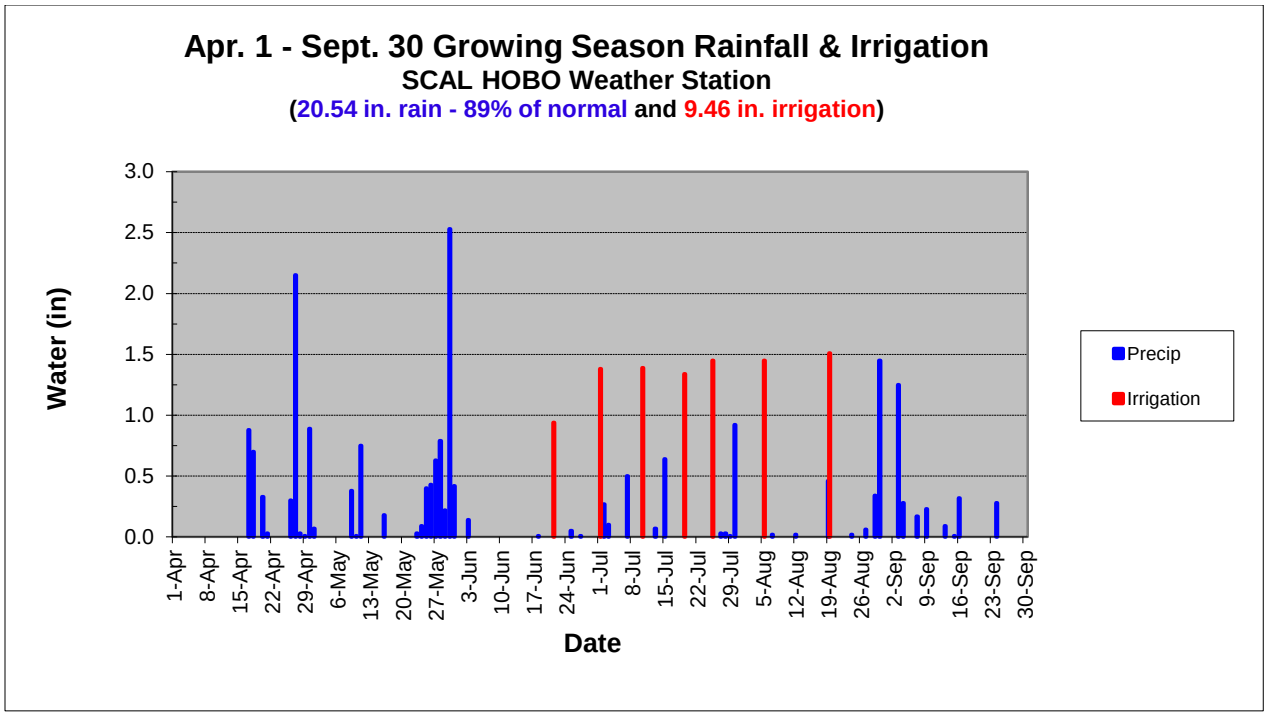
Subsoil moisture: Excellent-Moist

DATA COLLECTION:

Plant Populations:	The total number of corn plants in the center two rows of each plot was recorded on June 15, 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 11, 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 11, 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 11, 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.



Month	HOBO Weather Station 2016 Precip	30-yr Average	% Avg.
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	2.63	2.36	111
Total>>	20.54	23.17	88.6

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Insecticide Product	Rate of Product (/1000 row-ft)	Yield[1] (bu/acre)	Iowa 0-3 Root Ratings[1]	% Consistency Iowa 0-3 Scale ≤ 0.25[2,3]	% Root Lodging[1]	% Dead Plants[2]	% Broken Plants[2]	Extended Leaf Height[2] (inches)	PPA[2]
Force CS	0.46 fl oz	260.8 a	0.37 ab	70	0.3 a	0.0	0.0	37.3	34,634
AMV1091	0.44 fl oz	259.6 a	0.32 ab	70	0.4 a	0.0	0.6	36.6	35,089
SmartChoice HC	1.7 oz	258.8 a	0.28 ab	69	0.0 a	0.0	0.4	37.8	35,111
A21370B	1.2 oz	254.8 a	0.59 b	45	0.2 a	0.0	0.3	36.8	35,186
AMV1118	0.71 fl oz	254.4 a	0.31 ab	75	0.0 a	0.0	0.6	36.6	35,459
Aztec HC	1.5 oz	254.3 a	0.24 a	85	0.0 a	0.0	0.1	36.9	34,863
Untreated Check	----------	239.9 b	1.01 c	40	32.7 b	0.2	0.3	37.1	35,140
Treatment Probability		***0.0096***	***0.0021***	***0.0836***	***0.0043***	***0.4552***	***0.1682***	***0.3253***	***0.6933***

[1]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).
[2]Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).
[3]Averages were converted by the angular transformation of percentages to degrees, before MIXED, original percentages are reported.