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CORN: *Zea mays* L. ‘DeKalb DKC64-87RIB’ and ‘DeKalb DKC64-89RIB’

**EVALUATION OF SMARTSTAX TRAITED AND REFUGE CORN HYBRIDS IN
COMBINATION WITH SOIL INSECTICIDES AT PLANTING FOR LARVAL CORN
ROOTWORM CONTROL, 2014**

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Western corn rootworm (WCR): *Diabrotica virgifera virgifera* LeConte

SmartStax traited and refuge corn hybrids in combination with soil insecticides were evaluated for effectiveness of larval CRW control near Clay Center, NE during 2014. Trial site was late-planted corn and pumpkins (insecticide free) during 2013. Experimental design was a RCB with four replicates. Plot size was 4 rows x ~150 ft length with 30-inch row spacing. Soil type was a Crete silt loam. 'DeKalb DKC64-87 RIB' (contains GENSSRIB [SmartStax] insect and herbicide traits) and 'DeKalb DKC64-89RIB' (contains GENVT2PRIB insect and herbicide traits) corn hybrids were planted on 20 May with a 2-row JD 7100 Maximerge planter with finger pickup seed units. Each hybrid received a seed-applied treatment of Poncho 500 (clothianidin @ 0.5 mg ai/kernel) and Votivo. A northeast wind @ 14-18 mph occurred at planting. Liquid insecticides were applied IF in 5 GPA water solution via a CO₂ pressurized system. Granular insecticides were applied IF via the SmartBox application system. Plant populations were evaluated on 10 Jun. The total number of plants per plot was recorded and converted to plants per acre (PPA). Initial CRW egg hatch was first documented on 04 Jun. A high wind (northwest @ 82 mph) event occurred on 14 Jun resulting in plant breakage. The total number of broken plants in the center two rows of each plot was recorded on 18 Jun and converted to broken PPA. The total number of root lodged plants per plot due to larval CRW feeding was recorded on 17 Jul and converted to lodged PPA. Larval feeding damage was evaluated on 28 Jul. Five randomly selected plants were dug from each plot, washed, and rated using the Iowa State 0-3 scale (0 = no feeding, 1 = one node of roots pruned to within 1.5 inches of the stalk, 2 = two nodes of roots pruned to within 1.5 inches of the stalk, 3 = 3 or more nodes of roots pruned to within 1.5 inches of the stalk). Another significant weather event occurred on

01 Oct. Nickel to ping pong ball-sized hail defoliated corn plants and caused kernels to be dislodged from the ears. Plots were machine harvested on 22 Oct. Percent moisture and lbs of grain were recorded and corrected to 56 lbs/bu @ 15.5% moisture to evaluate yield levels. Data were analyzed by PROC MIXED with mean separation using differences of least square means ($P = 0.05$).

From planting (20 May) to larval feeding damage evaluation (28 Jul), rainfall totaled 8.91 inches and overhead irrigation, 1.40 inches. Mean root injury ratings (Iowa 0-3 Scale) for the GENSSRIB traited corn hybrid without soil insecticide averaged 0.10. The application of a soil insecticide to the GENSSRIB traited corn hybrid did not significantly reduce root injury ratings or enhance final grain yield levels. Mean root injury ratings (Iowa 0-3 Scale) for the GENVT2PRIB traited corn hybrid without soil insecticide averaged 0.43. With the exception of Capture LFR, planting-time soil insecticides applied to GENVT2PRIB traited corn statistically enhanced root injury protection and reduced root lodging compared to the untreated GENVT2P plots. This research was supported by industry gifts of pesticide and research funding.

Treatment ^a / Formulation	Rate-amt form /1000 row ft	Place- ment	Yield ^b (bu/acre)	Root Injury Rating ^b	Lodged Plants/Acre ^b	Plant/Acre Following Wind Event ^c	Broken Plants/Acre ^c	Early Plants/Acre ^c
GENSSRIB + Aztec 4.67G	3 oz	IF	251.4 a	0.08 a	0 a	31,730	161	31,891
GENSSRIB + Capture LFR	0.49 fl oz	IF	248.1 ab	0.08 a	0 a	32,212	267	32,479
GENSSRIB + Force CS	0.46 fl oz	IF	247.0 abc	0.08 a	0 a	32,066	178	32,244
GENSSRIB + Counter 20G	6 oz	IF	245.6 abc	0.09 a	0 a	31,984	219	32,203
GENSSRIB + Force 3G	4 oz	IF	245.1 abc	0.08 a	0 a	31,654	149	31,803
GENSSRIB	-----	---	243.5 abc	0.10 a	0 a	31,877	253	32,130
GENVT2PRIB + Force 3G	4 oz	IF	243.0 abc	0.22 a	0 a	31,826	237	32,063
GENVT2PRIB + Aztec 4.67G	3 oz	IF	240.9 bcd	0.16 a	0 a	32,010	251	32,261
GENVT2PRIB + Capture LFR	0.49 fl oz	IF	239.5 bcd	0.44 b	132 a	31,944	223	32,166
GENVT2PRIB + Counter 20G	6 oz	IF	239.2 bcd	0.19 a	0 a	31,766	347	32,133
GENVT2PRIB + Force CS	0.46 fl oz	IF	238.1 cd	0.20 a	0 a	32,094	119	32,213
GENVT2PRIB	-----	---	231.7 d	0.43 b	895 b	31,484	207	31,691

P 0.0215 0.0004 0.0057 0.6616 0.8923 0.6213

^aLiquid insecticides were applied in a 5 GPA water solution at planting. Granular insecticides were applied via the SmartBox application system at planting.

^bMeans in column followed by the same lower case letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

^cMeans in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

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Brand Name	Formulation	Common Name	Composition	Manufacturer
Capture	LFR	bifenthrin	2-methylbiphenyl-3-ylmethyl (1 <i>RS</i> ,3 <i>RS</i>)-3-[(<i>Z</i>)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate	FMC 1735 Market Street Philadelphia, PA 19103
Force Force	CS 3G	tefluthrin tefluthrin	2,3,5,6-tetrafluoro-4-methylbenzyl (1 <i>RS</i> ,3 <i>RS</i>)-3-[(<i>Z</i>)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate	Syngenta Crop Protection, Inc. P. O. Box 18300 Greensboro, NC 27409
Aztec	4.67G	tebupirimphos and cyfluthrin	(<i>RS</i>)-[<i>O</i> -(2- <i>tert</i> -butylpyrimidin-5-yl) <i>O</i> -ethyl <i>O</i> -isopropyl phosphorothioate] AND (<i>RS</i>)- α -cyano-4-fluoro-3-phenoxybenzyl (1 <i>RS</i> ,3 <i>RS</i> ;1 <i>RS</i> ,3 <i>SR</i>)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	Amvac 4100 E. Washington Boul. Los Angeles, CA 90023
Counter	20G	terbufos	<i>S-tert</i> -butylthiomethyl <i>O,O</i> -	Amvac

			diethyl phosphorodithioate	4100 E. Washington Blvd. Los Angeles, CA 90023
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