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CORN: *Zea mays* L. ‘Golden Harvest G11U58-3122’, ‘Golden Harvest G11U58-3111’ and ‘Golden Harvest G11U58-GT’

**EVALUATION OF STACKED AND SINGLE ROOTWORM 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

Corn hybrid family isolines possessing either stacked rootworm traits, single rootworm trait or refuge traits 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 three replicates. Plot size was 4 rows x 75 ft length with 30-inch row spacing. Soil type was a Crete silt loam. ‘Golden Harvest G11U58-3122’ (3122, contains Agrisure RW and Herculex RW rootworm traits), ‘Golden Harvest G11U58-3111’ (3111, contains Agrisure RW rootworm trait) and ‘Golden Harvest G11U58-GT’ (GT, contains no rootworm trait) corn hybrids were planted on 08 May with a 2-row JD 7100 Maximerge planter with finger pickup seed units. A southeast wind @ 8-11 mph occurred at planting. Liquid insecticides were applied IF in 5 GPA water solution via a CO₂ pressurized system. Plant populations were evaluated on 12 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 severe plant breakage. The total number of broken plants in the center two rows of each plot was recorded on 16 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 25 Jul. Six 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 21 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 (08 May) to larval feeding damage evaluation (25 Jul), rainfall totaled 11.75 inches and overhead irrigation, 1.40 inches. Mean root injury ratings (Iowa 0-3 Scale) for the untreated GT plots averaged 0.84. 3122, 3111 and GT plus Capture LFR treatments performed statistically better than the untreated GT plots based on root injury ratings. The wind event on 14 Jun significantly impacted PPA post-storm. As a result, treatment effect on yield levels was not significant. This research was supported by industry gifts of pesticide and research funding.

Treatment ^a / Formulation	Rate-amt form/acre	Place- ment	Yield ^c (bu/acre)	Root Injury Rating ^b	Lodged Plants/Acre ^c	Plant/Acre Following Wind Event ^b	Broken Plants/Acre ^b	Early Plants/Acre ^b
3122 + Force CS	10 oz	IF	211.6	0.08 a	0	24,875 a	3,142 a	28,017 b
3122	-----	---	208.3	0.08 a	0	21,459 bc	6,496 b	27,955 b
GT + Capture LFR	8 oz	IF	208.3	0.56 b	78	22,554 ab	6,339 b	28,892 b
3111 + Force CS	10 oz	IF	202.1	0.09 a	0	19,839 cd	10,297 c	30,137 a
3111	-----	---	183.6	0.09 a	0	17,579 d	11,211 c	28,789 b
GT	-----	---	194.3	0.84 c	742	22,085 bc	6,611 b	28,696 b

P 0.1086 <0.0001 0.1402 0.0013 0.0011 0.0264

^aLiquid insecticides were applied in a 5 GPA water solution 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	CS	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