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CORN: *Zea mays* L. 'DeKalb DKC60-69RIB'

EVALUATION OF LIQUID AND GRANULAR INSECTICIDE FORMULATIONS AT PLANTING FOR LARVAL CORN ROOTWORM CONTROL, 2017A

Terry A. DeVries

South Central Agricultural Laboratory

University of Nebraska-Lincoln

202 W. Fairfield St., P.O. Box 66

Clay Center, NE 68933

Phone: (402) 762-3536

Fax: (402) 762-3017

Email: tdevries1@unl.edu

Robert J. Wright

Department of Entomology

University of Nebraska-Lincoln

213 Entomology Hall

Lincoln NE 68583-0816

Email: rwright2@unl.edu

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

Liquid and granular insecticide formulations applied at planting were evaluated for effectiveness of larval WCR control near Clay Center, NE during 2017. Trial site was late-planted corn and pumpkin (insecticide free) during 2016. Experimental design was a RCB with four replicates. Plot size was 4 rows x 67-78 ft length with 30-inch row spacing. Soil type was a Crete silt loam. 'DeKalb DKC60-69RIB' (contains GENVT2PRIB [Genuity VT Double Pro] insect and herbicide traits) corn hybrid was planted on 19 Apr with a 2-row JD 7100 Maximerge planter with finger pickup seed units. The corn hybrid received a seed-applied insecticide treatment of Poncho 250 (clothianidin @ 0.25 mg AI/kernel). A southwest wind @ 10-15 mph occurred at planting. Liquid insecticide formulations were applied IF in a 5 GPA water solution via compressed air system. Granular insecticide formulations were applied IF via SmartBox application system. Initial WCR egg hatch was first documented on 31 May. Plant populations were evaluated on 1 Jun. The total number of plants in the center two rows of each plot was recorded and converted to plants per acre (PPA). Extended leaf height (ELH) of twenty randomly selected plants in the center two rows of each plot was recorded in inches on 19 Jun. Initial adult WCR emergence was witnessed on 28 Jun. The total number of root lodged plants in the center two rows of each plot due to larval WCR feeding was recorded on 30 Jun and converted to percentage root lodging. Larval feeding damage was evaluated on 10 Jul. Five randomly selected plants were dug from each plot (three from row 1 and two from row 4), 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). Percent consistency performance levels were calculated by determining the percentage of rated roots in each plot

with an Iowa 0-3 scale root injury rating < or = to 0.25. The center two rows of each plot were machine harvested on 20 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 (19 Apr) to larval feeding damage evaluation (10 Jul), rainfall totaled 9.42 inches and overhead irrigation, 2.56 inches. Mean root injury ratings (Iowa 0-3 Scale) for the untreated check averaged 2.00. All insecticide formulations significantly reduced larval WCR root injury ratings and early season root lodging percentages compared to the untreated check. Furthermore, Aztec HC, Force 10G and Force CS significantly reduced larval CRW injury versus Capture LFR and SmartChoice HC formulations based on average root injury ratings (Iowa 0-3 Scale). However, harvested grain yield levels were NS. This research was supported by industry gifts of pesticide and research funding.

Treatment/ Formulation	Rate-amt form /1000 row ft	Place -ment	Yield[d] (bu/acre)	Root Injury Rating[c]	% Consistency Iowa 0-3 Scale ≤ 0.25[c,e]	% Root Lodging[c]	ELH[d] (inches)	PPA[d]
Index 2.8CS[a]	0.72 fl oz	IF	266.3	1.16 bc	30 a	2.5 a	39.1	34,699
Capture LFR[a]	0.98 fl oz	IF	258.3	1.28 c	25 ab	10.9 a	38.1	34,672
Force 10G[b]	1.30 oz	IF	257.7	0.68 ab	30 a	0.8 a	37.0	34,696
Force CS[a]	0.50 fl oz	IF	253.5	0.74 ab	20 ab	0.6 a	39.6	33,916
Aztec HC[b]	1.50 oz	IF	253.1	0.57 a	50 a	4.6 a	39.9	34,888
SmartChoice HC[b]	1.70 oz	IF	252.7	1.47 c	5 b	16.1 a	33.4	34,937
Untreated Check	---	---	247.7	2.00 d	5 b	53.1 b	37.1	34,621
		P	0.1106	0.0001	0.0410	<0.0001	0.0911	0.8258

[a]Liquid insecticide applied in a 5 GPA water solution at planting.

[b]Granular insecticide applied with SmartBox application system at planting.

[c]Means 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).

[d]Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

[e]Averages were converted by the angular transformation of percentages to degrees, before MIXED, original percentages are reported.

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Brand Name	Formulation	Common Name	Composition	Manufacturer
Index	2.8CS	unknown	unknown	Amvac 4100 E. Washington Blvd. Los Angeles, CA 90023
Force	10G	unknown	unknown	
Aztec	HC	tebupirimphos AND cyfluthrin	(*RS*)-[*O*-(2-*tert*-butylpyrimidin-5-yl) *O*-ethyl *O*-isopropyl phosphorothioate] AND (*RS*)-α-cyano-4-fluoro-3-phenoxybenzyl (1*RS*,3*RS*;1*RS*,3*SR*)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate	
SmartChoice	HC	chlorethoxyfos AND bifenthrin	*O*,*O*-diethyl (*RS*)-*O*-(1,2,2,2-tetrachloroethyl) phosphorothioate AND 2-methylbiphenyl-3-ylmethyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-	

			dimethylcyclopropanecarboxylate	
Force	CS	tefluthrin	2,3,5,6-tetrafluoro-4-methylbenzyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate	Syngenta Crop Protection, LLC P.O. Box 18300 Greensboro, NC 27419-8300
Capture	LFR	bifenthrin	2-methylbiphenyl-3-ylmethyl (1*RS*,3*RS*)-3-[(*Z*)-2-chloro-3,3,3-trifluoroprop-1-enyl]-2,2-dimethylcyclopropanecarboxylate	FMC Corporation 1735 Market Street Philadelphia, PA 19103