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EVALUATION OF REGENT INSECTICIDE FOR EARLY-SEASON INSECT CONTROL IN CORN, 1996

by

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SUMMARY

Regent was shown to reduce rootworm damage when applied in-furrow at planting and to reduce corn borer numbers and tunneling when applied at planting, banded on 8-inch corn, or broadcasted on whorl-stage corn. However, surprisingly, Regent also appeared to reduce second generation corn borer numbers and tunneling.

INTRODUCTION

This experiment was designed to test Regent applied at planting and at the whorl stage for the control of corn rootworm larvae and corn borer larvae. Regent is a new soil insecticide that is not yet registered for use in corn.

PROCEDURES

Plots were planted at 30,600 seeds per acre on 9 May in a furrow-irrigated field at the Southwest Research-Extension Center, in Finney County, Kansas. The field was prewatered on 9 April, but the seed-bed dried out, and the field was watered again on 24 May to complete emergence. The soil type was a Richfield silt loam with a pH of 7.5 and an organic matter content of 1.5%. Plots were 2 rows (5 ft) by 50 ft long, arranged in a randomized complete block design, and replicated four times. Plots were separated by 10 ft alleyways at the end of each plot and with four rows of border corn between plots. Planting-time granular treatments were applied as a 7-inch band over the open seed-furrow (T-band) or into the open seed-furrow (in-furrow) with planter-mounted John Deere™ granular applicators. The liquid applications at planting were made with a CO₂ backpack sprayer mounted on the planter with nozzles directed into each furrow delivering 1.5 gal/acre. Rootworm damage was evaluated on four plants from each plot on 9 July

using the 6-point Iowa scale. Plant stunting also was rated visually as percent reduction in biomass relative to the best corn rootworm treatment (Counter). The banded treatment on 8-inch corn was made on 13 June with a hand sprayer. Whorl-stage applications were made on 11 July using a high clearance sprayer with three nozzles directed at each row and calibrated to deliver 20 gal/acre at 2 mph and 40 psi. A total of 6.5 inches of rain was recorded between planting and taking the root ratings and another 1.3 inches of rain was recorded between 9 July and 19 July when the corn borer ratings were taken. To assure first generation corn borer pressure, five European corn borer egg masses were pinned to every third plant in a 15-plant marked section in each plot on 25 June. These plants were evaluated for corn borer injury on 19 July using the Guthry scale and by dissecting plants to determine the number of corn borers and the amount of tunneling. Second generation damage was evaluated on 30 September by dissecting 15 plants in each plot. Yields were taken by mechanically harvesting each plot and measuring rows to correct for gaps created by the destructive sampling.

RESULTS AND DISCUSSION

Rootworm damage was severe, causing noticeable stunting, lodging, and stand loss. The in-furrow applications of Counter, Regent, and EXP 61216A applied at planting all significantly reduced the rootworm feeding injury. The banded application of Regent on 8-inch corn was applied too late to be very effective at reducing the rootworm damage. The planting-time applications of Regent and EXP 61216A reduced the amount of leaf injury from the manually applied first generation corn borer. The banded application of Regent on 8-inch corn significantly reduced damage by first generation corn borer. However, all of the Regent treatments reduced the amount of tunneling and the number of larvae from

the first generation corn borers . Surprisingly, the in-furrow planting-time application of Regent also significantly reduced numbers of second generation

European corn borer and corn borer tunneling. Yield loss appeared to be associated with rootworm injury rather than corn borer injury.

Table 1. Evaluation of Regent insecticide for control of first generation corn borer, 1996, Garden City, KS.						
Treatment/ Formulation	Rate lb(AI)/acre	Application Method	First Generation ECB - Manual Infestation			
			Leaf Damage 1-9 scale	% Plants with Leaf Damage	Tunnel Length in cm /15 Plants	Larvae /15 Plants
Check	—	—	2.1 ab	46.6 ab	7.4 a	3.5 a
EXP 61216A 3G*	0.13	in-furrow at planting	1.4 bcd	21.8 bc	1.3 cd	0.3 b
Counter 20CR	1.3	in-furrow at planting	2.2 a	53.6 a	4.4 ab	4.4 a
Regent 80WG*	0.13	in-furrow at planting	1.4 cd	17.5 bc	0.4 cd	0.6 b
Regent 80WG*	0.13	banded at 8-inch stage	1.1 d	8.3 c	0.0 d	0.0 b
Pounce 1.5 G	0.15	bdcst at whorl	1.7 abcd	42.1 ab	3.3 bc	0.7 b
EXP 61216A 3G*	0.15	bdcst at whorl	1.9 abc	59.9 a	0.9 cd	0.3 b
Regent 80WG*	0.13	bdcst at whorl	1.8 abc	42.9 ab	0.0 d	0.0 b
Regent 80WG*	0.06	bdcst at whorl	1.5 bcd	34.6 abc	0.7 cd	0.6 b
Regent 80WG*	0.03	bdcst at whorl	2.2 a	53.8 a	1.7 bcd	0.3 b
LSD			0.63	30.3	3.0	1.3
F-test Prob.			0.02	0.02	0.05	>0.00%
Means followed by same letter do not significantly differ (P=0.05, LSD)						
*These treatments not yet registered for use on corn.						

Table 2. Evaluation of Regent insecticide for control of corn rootworm damage and second generation corn borer, 1996, Garden City, KS.

Treatment/ Formulation	Rate lb(AI) acre	Application Method	Corn Rootworm			Second Generation Corn Borer/15 Plants			Yield bu/acre	
			Root Rating	% Plants > 3	Biomass % max.	# Plants Infested	SWCB Larvae	ECB Larvae		Tunnel Length in cm
Check	—	—	5.1 a	94 a	66 d	6.5 ab	2.3	5.8 ab	10.0 a	113.1 bc
EXP 61216A 3G*	0.13	In-furrow at Planting	3.1 b	31 b	86 b	—	—	—	—	130.1 ab
Counter 20CR	1.3	In-furrow at Planting	2.6 b	6 b	99 a	7.5 a	1.3	9.3 a	10.3 a	138.3 a
Regent 80WG*	0.13	In-furrow at Planting	3.0 b	13 b	92 ab	4.0 c	0.7	1.5 b	3.9 c	115.8 abc
Regent 80WG*	0.13	Banded at 8 Inch Stage	4.6 a	69 a	76 c	—	—	—	—	103.1 cd
Pounce 1.5 G	0.15	Bdct at Whorl	—	—	—	7.3 a	1.5	5.0 ab	8.5 ab	95.9 cd
EXP 61216A 3G*	0.15	Bdct at Whorl	—	—	—	—	—	—	—	80.8 d
Regent 80WG*	0.13	Bdct at Whorl	—	—	—	4.5 bc	1.0	2.5 b	5.1 bc	98.7 cd
Regent 80WG*	0.06	Bdct /Whorl	—	—	—	—	—	—	—	88.2 d
Regent 80WG*	0.03	Bdct /Whorl	—	—	—	—	—	—	—	98.7 cd
LSD			0.65	35	8.25	2.4	2.4	4.4	3.7	23.2
F-test Prob.			0.0001	0.005	0.0001	0.022	0.71	0.019	0.007	0.0005

Means followed by same letter do not significantly differ (P=0.05, LSD)

***These treatments not yet registered for use on corn.**

