Evaluation of Soil Insecticides in Continuous Corn

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Objective

To evaluate corn-yield benefit from using ProShield seed-coating technology in comparison to conventional granular insecticides in continuous corn.

Background

Cooperator:	Marsh Foundation/ Farm Focus	Herbicides:	PRE: Bicep II Magnum (2.1 qt/A) Princep 90DG (1.1 lbs/A)
County:	Van Wert		POST: Liberty (20 oz/A) + AMS
Nearest Town:	Van Wert	Fertilizer:	220 lbs/A UAN broadcast
Soil Type:	Hoytville silty clay loam	Variety:	Northrup King N58-D1
Previous Crop:	Corn	Planting Date:	May 6, 2000
Drainage:	Tile	Planting Rate:	28,000 seeds/A
Tillage:	Fall deep-till/ 2x spring cultivate	Row Width:	30 inches
		Harvest Date:	October 20, 2000
Soil Test:	pH 6.2, P 141 ppm, K 254 ppm		

Methods

Two granular insecticides, one untreated check, and a ProShield seed-coating treatment were replicated five times in a randomized complete block design. Each plot contained six rows and was 450 feet long. The study was planted using a John Deere 7000 Max Emerge six-row planter. The granular insecticides were applied in a T-Band at the full labeled rate. One treatment contained corn with a Force ST seed-coating treatment (ProShield) and was planted without the use of any additional granular insecticide. Root ratings were taken on July 18 by digging and washing five root systems from each plot and rating those root systems using the Iowa Root Rating Scale.

Harvest populations were evaluated by counting the number of plants on each side of a 17.5-feet tape at three different locations in each plot. The average of the number of plants counted per 17.5 feet was converted to plants per acre. Each plot was harvested and then weighed by a calibrated weigh wagon, and grain yield was adjusted to 15% moisture.

Results

Table 1. Root Ratings, Population, and Corn Yield.

Treatment	Rate per 1,000 feet of row	Root Rating	Harvest Population (plants/A)	Yield (bu/A)
Lorsban 15G	8.0 oz	2.36 a	26,100	112.2
Force 3G	4.0 oz	2.40 ab	26,300	114.2
ProShield	NA	2.64 bc	26,900	114.7
Check	NA	2.88 c	25,700	120.2
LSD (P = 0.05)		0.27	NS	NS
CV (<15% is credible)		7.60%	2.70%	7.20%

Means in a column followed by the same letter are not significantly different at P = 0.05.

NA = Not Applicable, NS = not significant.

Summary and Notes

Rootworm pressure in this study did not reach a level of damage that is considered economic. A root rating of 3.0 or higher frequently indicates the beginning of economic loss. To prevent yield loss, an insecticide should protect the corn roots so that no more than approximately one-third of a node of roots is destroyed by western corn rootworm larva. In this study, the check strips had an average root rating of 2.88. The results of this one-year study indicate that ProShield root ratings were not significantly different from that of the untreated check. The root ratings for the Lorsban and Force treatments were significantly lower than the untreated check; however, there was not a corresponding significant difference in corn yield. Harvest population and yields were not significantly different among the four treatments, as indicated in the table above. Although the check treatment yield appears greater than the other treatment yields, it was not statistically different due to variation within the replications.

The seed-coating approach is convenient, environmentally sound, and user-friendly as compared to conventional granular insecticides. However, emphasis must remain on selecting products based on performance. Two insecticide performance indicators that producers can use are root ratings and yields. When evaluating insecticide performance, it is important to evaluate check strips with moderate to heavy rootworm pressure established in the same fields with a given insecticide. Those products that deliver the best rootworm control should be considered for those areas where rootworm damage is common or anticipated.

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