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Seed-delivered rootworm control

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Seed-delivered rootworm control

Abstract

Novartis Seeds and Zeneca Ag Products have announced that they will be marketing ProShield™ technology with Force® ST insecticide as the "first seed-delivered corn rootworm control." The announcement states that this "innovation will help farmers conveniently control corn rootworms and other soil insects." ProShield™ is a patented seed-coating system that applies the insecticide directly to the seed and Force® ST was approved by the Environmental Protection Agency for commercial seed treatment of field corn, popcorn, and sweet corn. Novartis anticipates selling NK® brand hybrids with Force ST on the seed for the 2000 growing season.

Keywords

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Novartis Seeds and Zeneca Ag Products have announced that they will be marketing ProShield™ technology with Force® ST insecticide as the "first seed-delivered corn rootworm control." The announcement states that this "innovation will help farmers conveniently control corn rootworms and other soil insects." ProShield™ is a patented seed-coating system that applies the insecticide directly to the seed and Force® ST was approved by the Environmental Protection Agency for commercial seed treatment of field corn, popcorn, and sweet corn. Novartis anticipates selling NK® brand hybrids with Force ST on the seed for the 2000 growing season. The Novartis news release claims that the major advantage that this technology "offers to farmers is time-savings and convenience." A more important issue is protection of corn against insect damage.

During the past 2 years, American Agricultural Services has contracted Iowa State University to evaluate a variety of experimental seed-delivered insecticides for control of corn rootworm larvae. These experimental seed treatments are shown as "X" followed by a number in Table 1 or "PT" followed by a number in Table 2. American Agricultural Services has promoted Force ST for insect control, however, they have not stated which of these experimental products, if any, listed in the tables will be commercially marketed as a seed-delivered corn insecticide.

The data suggest that the best experimental seed treatments provide only marginal protection against corn rootworm larvae. All root ratings averaged 3.0 or higher. One of the best standards by which to judge a rootworm insecticide is to measure the consistency of performance in providing root protection. In Table 2, the best experimental seed treatment gave protection only half the time, the worse material protected only a third of the time, and the more conventional granular soil insecticides gave 71-100 percent consistency.

The news release also claims that ProShield will control cutworm, wireworm, and white grub. I do not have any data that evaluate the performance of this material against these insects.

The bottom line is that farmers should use a material that is safe and convenient, but also one that provides consistent protection against insect damage.

Table 1. Average root ratings for planting-time corn rootworm insecticide treatments (corn rootworm seed treatment test, Ames, Iowa, 1998).^a

Insecticide	Formulation	Rate ^b	Placement ^c	Root Rating ^{d,e}
Counter	20CR	1.2	T-band	1.1a

Counter	20CR	1.2	Furrow	1.4a
Lorsban	15G	1.2	T-band	1.5a
Aztec	2.1G	0.14	Furrow	1.5a
Aztec	2.1G	0.14	T-band	1.6a
Force	3G	0.12	T-band	1.7a
Lorsban	15G	1.2	Furrow	1.8a
Force	3G	0.12	Furrow	1.8a
X15625	ST	--	ST	3.0b
X12750	ST	--	ST	3.2bc
X15500	ST	--	ST	3.4bc
X15750	ST	--	ST	3.4bc
X0750	ST	--	ST	3.4bc
X12500	ST	--	ST	3.5bc
X0625	ST	--	ST	3.5bc
X12625	ST	--	ST	3.7bc
X0500	ST	--	ST	3.8bc
CHECK	--	--	--	4.3c

^a Planted May 13, 1998; replicates 2-4 evaluated on August 4, replicate 1 evaluated on August 11, 1998.

^b Granular insecticides expressed as ounces of active ingredient per 1,000 row-ft.

^c ST, seed treatment.

^d Means based on 40 observations (10 roots/treatment x 4 replications).

^e Means sharing a common letter do not differ significantly according to Ryan's Q test (P = 0.05).

Table 2. Average root damage ratings and percent consistency for planting-time insecticide treatments (Crawfordsville, Iowa, 1999).^a

				Node-	Node-	Percent	1-6
				Node-	Injury ^{d,e}		

Insecticide	Formulation	Rate ^b	Placement ^c	Injury ^{d,e} Full	Partial (%)	Consistency ^f	Root Rating ^g	Stand Count ^h
Counter	20CR	1.2	T-band	0	02	100	1.2a	25.75
Lorsban	15G	1.2	T-band	0	10	98	1.8ab	26.50
Force	3G	0.12	T-band	0	19	88	2.3ab	27.25
Aztec	2.1G	0.14	T-band	0	25	71	2.4abc	27.00
PT3	ST	--	ST	0	61	38	3.1bc	28.50
PT1	ST	--	ST	0	70	48	3.2bc	30.75
PT2	ST	--	ST	0	84	50	3.2bc	30.25
CHECK	--	--	--	1	10	3	3.7c	26.00

^a Planted May 20, 1999; stand counts taken on June 15, root injury was evaluated on August 9, 1999.

^b Ounces of active ingredient per 1,000 row-ft.

^c ST, seed treatment.

^d Chemical and check means based on 40 observations (10 roots \times 4 replications).

^e Iowa State University node-injury root rating scale. Full, number of nodes completely eaten; partial, percentage of a node (or an additional node) eaten.

^f Percent consistency is the percentage of times node-injury rating was 0.25 (1/4 node eaten) or less.

^g Means sharing a common letter do not differ significantly according to Ryan's Q test (P = 0.05).

^h Stand counts based on 1/1,000 acre; no significant differences between means at P = 0.05.

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