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Rootworm insecticides evaluated

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Abstract
Two integrated pest management strategies are commonly used to protect corn roots from corn rootworm injury: crop rotation and insecticides. If corn is not rotated, or if extended diapause northern corn rootworms occur in a field, a soil insecticide *might* be necessary to protect the roots in 2003. The reason we say it might be necessary is because many fields do not have a rootworm population of a sufficient size to cause economic damage. There are thousands of continuous cornfields across Iowa in which a rootworm insecticide is not used and is not necessary.

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Two integrated pest management strategies are commonly used to protect corn roots from corn rootworm injury: crop rotation and insecticides. If corn is not rotated, or if extended diapause northern corn rootworms occur in a field, a soil insecticide *might* be necessary to protect the roots in 2003. The reason we say it might be necessary is because many fields do not have a rootworm population of a sufficient size to cause economic damage. There are thousands of continuous cornfields across Iowa in which a rootworm insecticide is not used and is not necessary. But without field scouting information from last summer, it is difficult to know whether you will need a soil insecticide in 2003. If an insecticide is used next year, protection of corn roots should be one of the major considerations when selecting a product.

Corn rootworm insecticides were evaluated in side-by-side trials at several locations across the state. These field trials measure insecticide performance in protecting corn roots under a wide range of environmental conditions. Performance is measured two ways: root-injury ratings and product consistency (percentage of times product adequately protected corn roots from economically damaging injury).

Roots are rated using the new Iowa State node-injury scale, which rates roots from 0 to 3. The node-injury scale more accurately reflects the relationship of injury from the low end to the high end of the scale, compared with the old Iowa 1-6 scale. We encourage you to view the interactive root rating page at http://www.ent.iastate.edu/pest/rootworm/nodeinjury/nodeinjury.html to better understand this root-injury rating system.

Data from 2002 show the consistency of product performance (Table 1) and percentage of lodged plants (Table 2) at four Iowa locations. A three-year summary of product consistency is shown in Table 3.

No insecticide was 100 percent consistent in providing adequate protection (an injury rating of 0.25 node or less) during 2000-2002 (Table 3). From a statistical standpoint, all products in Table 3 from Aztec 2.1G to Fortress 5G (T-band SmartBox) provided similar levels of consistency. However, some products did not perform well. Most notable were Regent 4SC and the two seed treatments, ProShield and Prescribe. These products did not consistently protect roots from corn rootworm injury, especially in these tests where we had moderate-to-large rootworm populations. There are other insecticides that give consistently better root protection.

Consistent performance is one factor to consider when using a corn rootworm insecticide. Other factors worthy of consideration might be cost, pounds of active ingredient being applied per acre, ease of handling, application equipment needed, other pests controlled, restricted

use labeling, and potential hazards to surface water.

Table 1. Iowa State University 2002 corn rootworm insecticide performance - product consistency.

		Product Consistency (%)			
		Ames	Crawfordsville	Nashua	Sutherland
Insecticide	Placement	(Central IA)	(SE IA)	(NE IA)	(NW IA)
Aztec 2.1G	Furrow	85 ab	25 c-g	68 a-e	67 a-c
Aztec 2.1G	T-band	95 a	75 ab	100 a	93 a
Aztec 4.67G	Furrow SB	55 a-e	10 fg	76 a-d	87 a
Aztec 4.67G	T-band SB	55 a-e	20 d-g	96 a	73 a-c
Capture 2EC	Furrow	20 d-f	0 g	48 a-f	60 a-c
Capture 2EC	T-band	20 d-f	5 g	40 b-f	27 b-d
Counter 20CR	Furrow	85 ab	50 a-f	80 ac	87 a
Counter 20CR	T-band	95 a	90 a	84 ab	80 ab
Force 3G	Furrow	40 b-f	15 e-g	96 a	87 a
Force 3G	T-band	40 b-f	65 a-c	84 ab	87 a
Fortress 5G	Furrow SB	85 ab	40 b-g	8 f	100 a
Fortress 5G	T-band SB	85 ab	60 a-d	28 c-f	87 a
Fortress 2.5G	Furrow	85 ab	65 a-c	20 ef	100 a
Lorsban 15G	Furrow	75 a-c	15 e-g	32 b-f	80 ab
Lorsban 15G	T-band	70 a-d	55 a-e	24 d-f	47 a-d
Poncho	ST	15 ef	5 g	32 b-f	60 a-c
Prescribe	ST	20 d-f	5 g	28 c-f	0 d
ProShield	ST	30 c-f	0 g	16 ef	87 a
Regent 4SC	Furrow-M	0 f	0 g	8 f	20 cd
CHECK	--	0 f	0 g	0 f	20 cd

T-band and Furrow, insecticide applied at planting time; SB, SmartBox application; Furrow-M, microtube application, in-furrow; water carrier rate of 4 gallons/acre.

Data represent side-by-side comparisons. Ames and Crawfordsville chemical means are based on 20

observations, multiple check means are based 60 observations (4 of 4 replications analyzed); Nashua (chemical and check means are based on 25 observations (5 of 6 replications analyzed); Sutherland chemical and check means are based on 15 observations (3 of 4 replications analyzed); replications that did not have sufficient larval feeding to challenge a product's performance (UTC replicate mean <0.75 of a node injured) were deleted from the analysis. Product consistency represents percentage of times Node-Injury rating was 0.25 (1/4 node eaten) or less. Means sharing a common letter do not differ significantly (Ryan's Q test, P < 0.05).

Table 2. Iowa State University 2002 corn rootworm insecticide performance - lodged plants.

		% Lodged Plants			
		Ames	Crawfordsville	Nashua	Sutherland
Insecticide	Placement	(Central IA)	(SE IA)	(NE IA)	(NW IA)
Aztec 2.1G	Furrow	3 a	10 a	0	0
Aztec 2.1G	T-band	3 a	3 a	0	0
Aztec 4.67G	Furrow SB	10 ab	28 a	0	0
Aztec 4.67G	T-band SB	0 a	20 a	0	0
Capture 2EC	Furrow	10 ab	73 b	0	0
Capture 2EC	T-band	5 ab	73 b	6	0
Counter 20CR	Furrow	0 a	5 a	0	0
Counter 20CR	T-band	0 a	0 a	0	0
Force 3G	Furrow	0 a	33 a	0	0
Force 3G	T-band	10 ab	20 a	0	0
Fortress 5G	Furrow SB	0 a	8 a	6	0
Fortress 5G	T-band SB	3 a	13 a	6	0
Fortress 2.5G	Furrow	0 a	0 a	2	0
Lorsban 15G	Furrow	0 a	25 a	24	0
Lorsban 15G	T-band	0 a	0 a	6	0
Poncho	ST	48 bc	70 b	8	3
Prescribe	ST	48 bc	85 b	14	30
ProShield	ST	23 ab	98 b	18	10
Regent 4SC	Furrow-M	48 bc	95 b	10	0
CHECK	--	70 c	98 b	28	30

T-band and Furrow, insecticide applied at planting time; SB, SmartBox application; Furrow-M, microtube application, in-furrow; water carrier rate of 4 gallons/acre.

Side-by-side comparisons. Percentage of plants lodged/leaning at least 30° from vertical in 17.5 row-ft; replications that did not have sufficient larval feeding to challenge a product's performance (UTC replicate mean <0.75 of a node injured) were deleted from this analysis. Means sharing a common letter do not differ significantly (Ryan's Q test, P < 0.05).

Table 3. Three-year (2000-2002) summary of root-injury ratings and product consistency (%) for planting-time insecticide treatments. Iowa State University corn rootworm efficacy tests (16 locations).

Insecticide	Placement	Node-Injury[a] (0-3)	Product Consistency (%)[b]
Aztec 2.1G	T-band	0.24 a	79 a
Counter 20CR	T-band	0.31 a	75 ab
Aztec 2.1G	Furrow	0.32 a	71 ab
Force 3G	Furrow	0.32 a	71 ab
Counter 20CR	Furrow	0.34 a	70 ab
Force 3G	T-band	0.36 ab	70 ab
Fortress 5G	Furrow SB	0.37 ab	68 ab
Fortress 5G	T-band SB	0.38 ab	68 ab
Lorsban 15G	T-band	0.45 abc	59 bc
Capture 2EC	T-band	0.59 bc	48 c
Lorsban 15G	Furrow	0.62 c	47 c
Regent 4SC	Furrow-M	1.05 d	32 d
ProShield ST	Seed Trt	1.17 d	25 de
Prescribe ST	Seed Trt	1.27 d	13 ef
CHECK	--	1.71 e	8 f

T-band and Furrow, insecticide applied at planting time; SB, SmartBox application of 3 oz mat./1000 row-ft in 2000 and 2001; 3.7 oz mat./1000 row-ft in 2002. Furrow-M, microtube application, in-furrow (water carrier rate of 4 gallons/acre).

Side-by-side comparisons in 67 replications (chemical means based on 290 observations; multiple check means based on 554 observations; replications that did not have sufficient

larval feeding to challenge a product's performance (UTC replicate mean <0.75 of a node injured) were deleted from this analysis (67 of 84 replications analyzed). Means (within a column) sharing a common letter do not differ significantly (Ryan's Q test, P < 0.05).

[a] Iowa State Node-Injury Scale (0-3). Number of full or partial nodes completely eaten. Values sharing a common letter do not differ significantly according to Ryans's Q test (P = 0.05).

[b] Product consistency represents percentage of times node-injury rating was 0.25 (1/4 node eaten) or less.

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