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# Corn Rootworm Insecticide Performance

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**Abstract**
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# Corn Rootworm Insecticide Performance

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## Introduction

Commercially available corn rootworm insecticides are evaluated yearly for their ability to protect corn root systems from corn rootworm feeding injury. A two-year summary from five locations throughout Iowa is in this report.

## Materials and Methods

Crawfordsville plots were planted May 4, 2004 in an area that had been a corn rootworm beetle "catch crop" (large populations of late-planted corn) the previous year. The experimental design was a completely randomized block with two-row treatments 100 ft in length, replicated four times. A four-row John Deere 7100 planter with 30-in. row spacing was used to plant the plots at 29,900 seeds/acre. Specially designed seed hoppers (with standard "finger pickup mechanisms") were used to handle the small amounts of prebagged seeds. DKC60-12 was the seed used for YieldGard Rootworm treatments. Cruiser and Poncho seed treatments (high rate for corn rootworm) were commercially applied to DKC60-15, the isoline of the transgenic seed. The isoline seed was also used with the granular and liquid insecticide treatments. Regent and Capture liquid treatments were applied at 4 and 5 gpa of finished spray, respectively. On July 8, following the majority of corn rootworm feeding, corn root systems were dug, washed, and rated for injury on the Iowa State node-injury scale: 0.00 equals no feeding; 1.00 equals one node (circle or roots), or the equivalent of an entire node, eaten back to within approximately 1.5 in. of the stalk; 2.00 equals two nodes eaten; and 3.00 equals three nodes eaten. Damage in between complete nodes eaten is noted as the percentage of the node missing (i.e., 0.25 = 1/4 of one node eaten, 0.50 = 1/2 node eaten, 1.25 = 1 1/4 nodes eaten, etc.). Plant stand and lodging counts were taken from 17.5 row-ft in each row of the two-row treatments on October 13. Plots were machine harvested on October 19.

## Results and Discussion

Table 1a lists the results from the 2004 Crawfordsville test. There was moderate rootworm feeding pressure with 1.17 nodes of roots eaten in the untreated check (CHECK). There were no significant differences in stand counts between treatments. The Cruiser seed treatment was the only treatment not significantly different from the CHECK in node injury, with both having approximately one node of root eaten. Cruiser was also not significantly different from the CHECK in product consistency, percent lodging, and yield measurements.

In the two-year summary (Table 1b), node-injury values were based on the mean of 170 root systems. Treatments that kept node injury less than one node per root had very little lodging. The YieldGard RW treatment (transgenic seed containing a *Bt* protein) provided excellent protection from corn rootworm feeding. Product consistency was 98% and yields averaged 26 bushels/acre more than the CHECK.

**Table 1a. 2004 evaluations for labeled corn rootworm treatments applied at planting time, Crawfordsville, IA.**

| | | Crawfordsville (SE, IA) | | | | |
|---|---|---|---|---|---|---|
| Treatment | Placement[1] | Node injury[2,3] | Product consistency[3,4] | Percent lodging[3] | Stand count[5] | Yield (bu/a)[3] |
| Aztec 2.1G | Furrow | 0.16 ab | 100 a | 0 a | 28.38 | 185 a |
| Aztec 2.1G | T-band | 0.22 ab | 88 ab | 0 a | 27.88 | 175 a |
| Aztec 4.67G | Furrow SB | 0.33 bc | 73 ab | 3 ab | 27.63 | 174 ab |
| Aztec 4.67G | T-band SB | 0.26 ab | 85 ab | 0 a | 27.25 | 170 abc |
| Capture 2EC | Furrow | 0.39 bcd | 58 bcd | 2 ab | 27.38 | 180 a |
| Capture 2EC | T-band | 0.38 bcd | 65 abc | 1 a | 27.71 | 171 abc |
| Cruiser 5FS | ST | 0.98 f | 10 e | 36 c | 27.75 | 154 bc |
| Empower2 1.15G | Furrow | 0.72 e | 23 de | 17 b | 26.38 | 171 abc |
| Empower2 1.15G | T-band | 0.58 cde | 20 cde | 6 ab | 27.25 | 178 a |
| Force 3G | Furrow | 0.18 ab | 98 a | 0 a | 27.25 | 184 a |
| Force 3G | T-band | 0.24 ab | 85 ab | 0 a | 27.13 | 185 a |
| Force 3G | T-band SB | 0.23 ab | 93 ab | 0 a | 27.88 | 170 abc |
| Fortress 2.5G | Furrow | 0.26 ab | 90 ab | 1 a | 26.88 | 173 ab |
| Fortress 5G | Furrow SB | 0.18 ab | 98 a | 0 a | 28.75 | 175 a |
| Lorsban 15G | T-band | 0.28 ab | 78 ab | 0 a | 28.13 | 187 a |
| Poncho 1250 | ST | 0.60 cde | 32 cde | 9 ab | 27.38 | 176 a |
| Regent 4SC | Furrow-M | 0.64 de | 30 cde | 12 ab | 27.25 | 170 abc |
| YieldGard RW | *Bt* seed | 0.02 a | 100 a | 3 ab | 26.88 | 175 a |
| CHECK | ---- | 1.17 f | 0 e | 39 c | 27.13 | 151 c |

**Table 1b. 2003–2004 summary of products used for the control of corn rootworms (five locations).**

| Treatment | Placement[1] | Node injury[2,3] | Product consistency[3,4] | Percent lodging[3] | Stand count[5] | Yield (bu/a)[3] |
|---|---|---|---|---|---|---|
| Aztec 2.1G | Furrow | 0.24 ab | 82 ab | 0 a | 28.15 | 161 ab |
| Aztec 2.1G | T-band | 0.33 b | 70 b | 0 a | 27.71 | 155 bc |
| Aztec 4.67G | Furrow SB | 0.29 ab | 74 b | 1 a | 28.03 | 157 abc |
| Aztec 4.67G | T-band SB | 0.27 ab | 81 ab | 0 a | 27.70 | 157 abc |
| Capture 2EC | T-band | 0.72 d | 42 de | 2 a | 27.62 | 155 bc |
| Cruiser ST | ST | 1.34 e | 10 fg | 20 b | 27.68 | 158 abc |
| Force 3G | Furrow | 0.26 ab | 82 ab | 0 a | 27.50 | 164 ab |
| Force 3G | T-band | 0.26 ab | 79 b | 0 a | 27.29 | 164 ab |
| Fortress 2.5G | Furrow | 0.38 bc | 71 b | 1 a | 27.73 | 157 abc |
| Fortress 5G | Furrow SB | 0.61 cd | 63 bc | 2 a | 27.68 | 158 abc |
| Lorsban 15G | T-band | 0.70 d | 51 cd | 2 a | 28.09 | 156 bc |
| Poncho 1250 | ST | 0.84 d | 25 ef | 3 a | 27.24 | 162 ab |
| YieldGard RW | *Bt* seed | 0.03 a | 98 a | 1 a | 27.35 | 171 a |
| CHECK | ---- | 1.69 f | 2 g | 26 c | 27.18 | 145 c |

[1]SB=SmartBox application; ST=seed treatment; M=microtube application.
[2]Iowa State node-injury scale (0–3). Number of full or partial nodes completely eaten.
[3]Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$).
[4]Product consistency=percentage of times nodal injury was 0.25 (1/4 node eaten) or less.
[5]No significant differences between means (ANOVA, $P \leq 0.05$).