

2003

# Corn Rootworm Insecticide Performance

James Oleson  
*Iowa State University*

Follow this and additional works at: [http://lib.dr.iastate.edu/farms\\_reports](http://lib.dr.iastate.edu/farms_reports)



Part of the [Agricultural Science Commons](#), [Agriculture Commons](#), and the [Entomology Commons](#)

---

## Recommended Citation

Oleson, James, "Corn Rootworm Insecticide Performance" (2003). *Iowa State Research Farm Progress Reports*. 1504.  
[http://lib.dr.iastate.edu/farms\\_reports/1504](http://lib.dr.iastate.edu/farms_reports/1504)

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact [digirep@iastate.edu](mailto:digirep@iastate.edu).

---

# Corn Rootworm Insecticide Performance

## **Abstract**

Commercially available corn rootworm granular and liquid insecticides, as well as seed treatments, are evaluated yearly for their ability to protect corn root systems from corn rootworm feeding injury. The 2002 data from the Nashua farm plus a 3-year, multi-location summary are presented in this report.

## **Keywords**

Entomology

## **Disciplines**

Agricultural Science | Agriculture | Entomology

# Corn Rootworm Insecticide Performance

Jim Oleson, agricultural specialist  
Department of Entomology

## Introduction

Commercially available corn rootworm granular and liquid insecticides, as well as seed treatments, are evaluated yearly for their ability to protect corn root systems from corn rootworm feeding injury. The 2002 data from the Nashua farm plus a 3-year, multi-location summary are presented in this report.

## Materials and Methods

NK N65-Y3 was planted May 14, 2002, in an area that had been a corn rootworm beetle “catch crop” (high populations of late-planted corn) the previous year. The experimental design was a randomized complete block, with treatments applied to single 100-ft rows and replicated six times. Granular and liquid planting-time insecticide formulations were applied with modified application equipment mounted on a four-row John Deere 7100 planter (30-inch row spacing). On July 30, corn root systems were dug, washed, and rated for damage on the following 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 two inches 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.). The Node-Injury scale allows us to additionally calculate a precise product performance consistency. Product consistency equals the percentage of times a treatment limited feeding damage to 0.25 (1/4 of a node eaten) or less. Beyond this point, economic damage can occur. Stand counts were taken on June 16, lodging counts on September 5, and the plot was machine-harvested on October 27.

## Results and Discussion

Table 1 lists the results from the 2002 Nashua test. There was heavy rootworm pressure with 1.96 nodes of roots eaten in the untreated CHECK. All treatments from Poncho ST through Regent 4SC were not significantly different from the CHECK. There were no significant differences in regard to stand counts. With only light lodging and adequate rainfall throughout the growing season, there were no significant yield differences between any of the treatments.

In the 3-year summary (Table 2), only those treatments that were tested all three years in side-by-side trials are listed. Results are from seven locations, representing a variety of soil types, tillages, fertilities, corn rootworm pressures, and environmental conditions. The seed treatments ProShield and Prescribe were significantly different from the CHECK in regard to Node-Injury, consistency, and lodging. However, they were not significantly different from the CHECK in regard to yield. From a statistical standpoint, all products from Aztec 2.1G through Regent 4SC had yields that were similar. A word of caution is in order, though, when interpreting yield results. These data represent yields from locations that had generally *normal* rainfall amounts during the growing seasons. When there are drought conditions, we routinely see significantly lower yield differences between 0.25 and 1.00 node. An example of this was seen this year at Crawfordsville (southeast Iowa). The corn plants suffered severe moisture stress during pollination, and severe lodging also occurred. When rootworms ate at least 1.00 node of roots, there was no less than 63% lodging. Yields decreased 58% when root injury increased from 0.25 to 1.00 node.

**Table 1. Average root-injury, product consistency, percent lodging, and yield for planting-time insecticide treatments, yield test, Nashua.**

| Insecticide   | Placement <sup>1</sup> | Node-Injury <sup>2,4</sup> |             | Product consistency <sup>3,4</sup> | Percent lodging <sup>5</sup> | Yield (bu/acre) <sup>5</sup> |
|---------------|------------------------|----------------------------|-------------|------------------------------------|------------------------------|------------------------------|
|               |                        | Full                       | Partial (%) |                                    |                              |                              |
| Aztec 2.1G    | T-band                 | 0 .                        | 12 a        | 100 a                              | 0                            | 177                          |
| Force 3G      | Furrow                 | 0 .                        | 16 a        | 96 a                               | 0                            | 188                          |
| Counter 20CR  | T-band                 | 0 .                        | 21 ab       | 84 ab                              | 0                            | 179                          |
| Force 3G      | T-band                 | 0 .                        | 21 ab       | 84 ab                              | 0                            | 185                          |
| Aztec 4.67G   | T-band SB              | 0 .                        | 22 ab       | 96 a                               | 0                            | 200                          |
| Counter 20CR  | Furrow                 | 0 .                        | 30 a-c      | 80 a-c                             | 0                            | 188                          |
| Aztec 2.1G    | Furrow                 | 0 .                        | 33 a-c      | 68 a-e                             | 0                            | 200                          |
| Aztec 4.67G   | Furrow SB              | 0 .                        | 33 a-c      | 76 a-d                             | 0                            | 194                          |
| Capture 2EC   | T-band                 | 0 .                        | 44 a-d      | 40 b-f                             | 6                            | 185                          |
| Capture 2EC   | Furrow                 | 0 .                        | 63 a-e      | 48 a-f                             | 0                            | 186                          |
| Fortress 5G   | T-band SB              | 0 .                        | 77 a-f      | 28 c-f                             | 6                            | 189                          |
| Lorsban 15G   | T-band                 | 0 .                        | 79 a-f      | 24 d-f                             | 6                            | 182                          |
| Fortress 5G   | Furrow SB              | 0 .                        | 91 a-f      | 8 f                                | 6                            | 186                          |
| Prescribe ST  | ST                     | 1 .                        | 05 b-f      | 28 c-f                             | 14                           | 185                          |
| Poncho ST     | ST                     | 1 .                        | 14 c-g      | 32 b-f                             | 8                            | 212                          |
| Lorsban 15G   | Furrow                 | 1 .                        | 15 c-g      | 32 b-f                             | 24                           | 191                          |
| Fortress 2.5G | Furrow                 | 1 .                        | 23 d-g      | 20 ef                              | 2                            | 186                          |
| ProShield ST  | ST                     | 1 .                        | 40 e-g      | 16 ef                              | 18                           | 174                          |
| Regent 4SC    | Furrow-M               | 1 .                        | 57 fg       | 8 f                                | 10                           | 204                          |
| CHECK         | ---                    | 1 .                        | 96 g        | 0 f                                | 28                           | 174                          |

<sup>1</sup>T-band & Furrow = insecticide applied at planting time; SB = SmartBox application of 3.7 oz mat./1000 row-ft; Furrow-M = microtube application, in-furrow (water carrier rate of 4 gallons/a); ST=seed treatment.

<sup>2</sup>Iowa State Node-Injury Scale (0-3); full = number of nodes completely eaten; partial = percentage of a node (or an additional node) eaten.

<sup>3</sup>Product consistency = percentage of times Node-Injury rating was 0.25 (1/4 node eaten) or less.

<sup>4</sup>Means sharing a common letter do not differ significantly according to Ryan's Q Test ( $P \leq 0.05$ ).

<sup>5</sup>No significant differences between means (ANOVA,  $P \leq 0.05$ ).

**Table 2. Three-year (2000–2002) summary of root-injury, product consistency, percent lodging, and yield for planting-time insecticide treatments, Iowa State University corn rootworm efficacy tests (7 locations)<sup>1</sup>.**

| Insecticide  | Placement <sup>2</sup> | Node-Injury <sup>3,5</sup> |             | Product consistency (%) <sup>4,5</sup> | Percent lodging <sup>5</sup> | Yield <sup>5</sup> (bu/acre) |
|--------------|------------------------|----------------------------|-------------|--|------------------------------|------------------------------|
|              |                        | Full                       | Partial (%) |  |                              |                              |
| Aztec 2.1G   | T-band                 | 0 . 22                     | a           | 81 a                                   | 1 a                          | 159 ab                       |
| Force 3G     | Furrow                 | 0 . 27                     | a           | 78 a                                   | 3 a                          | 161 ab                       |
| Force 3G     | T-band                 | 0 . 29                     | a           | 74 ab                                  | 6 ab                         | 163 ab                       |
| Aztec 2.1G   | Furrow                 | 0 . 30                     | a           | 74 ab                                  | 2 a                          | 168 a                        |
| Counter 20CR | T-band                 | 0 . 30                     | a           | 74 ab                                  | 2 a                          | 154 ab                       |
| Counter 20CR | Furrow                 | 0 . 34                     | a           | 71 a-c                                 | 2 a                          | 160 ab                       |
| Fortress 5G  | T-band SB              | 0 . 41                     | ab          | 65 a-c                                 | 6 ab                         | 158 ab                       |
| Fortress 5G  | Furrow SB              | 0 . 45                     | ab          | 61 a-d                                 | 6 ab                         | 160 ab                       |
| Lorsban 15G  | T-band                 | 0 . 47                     | ab          | 54 b-e                                 | 3 a                          | 157 ab                       |
| Capture 2EC  | T-band                 | 0 . 51                     | ab          | 51 c-e                                 | 6 ab                         | 162 ab                       |
| Lorsban 15G  | Furrow                 | 0 . 71                     | b           | 43 d-f                                 | 8 ab                         | 155 ab                       |
| Regent 4SC   | Furrow-M               | 1 . 03                     | c           | 35 e-f                                 | 16 bc                        | 164 ab                       |
| ProShield    | ST                     | 1 . 19                     | c           | 26 fg                                  | 23 c                         | 149 bc                       |
| Prescribe    | ST                     | 1 . 29                     | c           | 12 gh                                  | 22 c                         | 150 bc                       |
| CHECK        | ----                   | 1 . 93                     | d           | 4 h                                    | 43 d                         | 137 c                        |

<sup>1</sup>Side-by-side comparisons in 35 replications; replications that did not have sufficient larval feeding to challenge a product's performance (CHECK rep mean <0.75 of a node injured) were deleted from these analyses (35 of 44 replications analyzed).

<sup>2</sup>T-band & Furrow = insecticide applied at planting time; SB = SmartBox application of 3 oz mat./1000 row-ft in 2000 & 2001; 3.7 oz mat./1000 row-ft in 2002; Furrow-M = microtube application, in-furrow (water carrier rate of 4 gallons/a); ST=seed treatment.

<sup>3</sup>Iowa State Node-Injury Scale (0-3); full = number of nodes completely eaten; partial = percentage of a node (or an additional node) eaten.

<sup>4</sup>Product consistency = percentage of times Node-Injury rating was 0.25 (1/4 node eaten) or less.

<sup>5</sup>Means sharing a common letter do not differ significantly according to Ryan's Q Test ( $P \leq 0.05$ ).