

2002 CORN ROOTWORM SOIL INSECTICIDE EVALUATION¹

Final Report

University of Nebraska
Agricultural Research and Development Center
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¹ The data presented in this report are not to be released to the public without the written permission of the Department of Entomology, University of Nebraska, Lincoln, Nebraska.

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| Background Information - Agronomic | Background Information - Entomology |
| Experimental Design | Environmental Conditions at Planting |
| Rainfall and Irrigation | Experimental Compounds Tested |
| Root Damage Evaluations | |

Background Information - Agronomic

Hybrid: Pioneer 33G26
Row Spacing: 30 inches
Planting Date: 3 May 2002
Planter: Kinze model 2100, 4 row cone

| | |
|----------------------------------|--|
| Planting Depth: | 2 inches |
| Application Equipment: | <u>Granular insecticides</u> Planting: planter mounted cone-belt system |
| | <u>Liquid insecticides</u> Planter mounted CO2 pressurized sprayer |
| Field Preparation: | Spring 2002 - disked and harrowed |
| Herbicides Applied: | 3 May 2002: Bicep II Magnum, 2.0 qt/A, pre emerge 31 May 2002: 1.0 oz Permit and 0.5 oz Accent / A |
| Fertilizer Applied: | 150 lb. N/A applied as NH3, 5 April 2002 |
| Previous Crop: | Continuous corn (trap crop) |
| Soil Information: | |
| Type: | Silty clay loam |
| Ph: | 6.4 |
| CEC: | 29.4 |
| % organic matter: | 2.8 |
| % clay: | 29.05 |
| % silt: | 66.67 |
| % sand: | 4.28 |
| Plant Population/ Phytotoxicity: | There were no significant differences ($P > 0.05$) among treatment stand count means, or among number of abnormal plants per treatment at V2-3 growth stage (Hanway 1997). Because there was a strong trend toward plant stand differences among treatments ($P = 0.06$) stands \pm SEM are presented for each treatment in Table 1. The overall mean number of plants/33.5' \pm SEM = 47.0 \pm 0.3. |
| Insecticide History: | Insecticide free: 1993, 1997, 1999, 2001 Multiclass soil insecticide trials: 1994-1996, 1998, 2000 |

Background Information - Entomological

Species present: Northern corn rootworm, *Diabrotica barberi* Smith and Lawrence, and western corn rootworm, *D. virgifera virgifera* LeConte. Initial rootworm egg hatch occurred between 31 May - 3 June 2002 (predominantly western corn rootworm).

Root Evaluation: 1-6 (Hills and Peters 1971) 0-3 root rating scales were used to evaluate larval corn rootworm damage in each treatment. Five roots were evaluated in each treatment and replication.

Root Evaluation Date: 16 July 2002

Background Information - Experimental Design

Design: Randomized complete block design
Replicated four times
□ Single row treatments

Row Length: 33.5 feet

Statistical Analysis: Plant Stands, Root Ratings: Standard ANOVA procedures; LSD test was used for mean separation where statistical differences ($P = 0.05$) occurred.

Background Information - Environmental

Conditions at planting:

Air temperature: 23°C

Wind speed: 15-20 mph at 5 ft height

Wind direction: South

Soil temperature 2" depth: 21°C

Soil temperature surface: 28°C

Soil moisture, 0-3" depth: 18.5 % water (gravimetric method)

% cloud cover: clear, 0 % cloud cover

% relative humidity: not recorded

Residue on surface: 30% of soil surface covered with crop residue; soil very moist, somewhat cloddy

Background Information - Rainfall and Irrigation

| April | | May | | June | | July | |
|-------|--------------------|-------|--------------------|-------|--------------------|-------|--------------------|
| 08 | 0.04 inch | 01 | 0.08 inch | 10 | 0.20 inch | 06 | 0.51 inch |
| 11 | 0.24 inch | 06 | 0.20 inch | 11 | 0.04 inch | 07 | 0.24 inch |
| 16 | 0.39 inch | 10 | 0.04 inch | 12 | 0.28 inch | 10 | 0.12 inch |
| 20 | 0.35 inch | 11 | 1.14 inches | | | 21 | 0.08 |
| 21 | 0.04 inch | 17 | 0.04 inch | | | 22 | 0.24 inch |
| 22 | 0.08 inch | 22 | 0.12 inch | | | 26 | 0.24 |
| 24 | 0.04 inch | 23 | 0.04 | | | | |
| 27 | 1.61 inches | 24 | 0.67 inch | | | | |
| | | 26 | 0.35 inch | | | | |
| | | 28 | 0.28 | | | | |
| Total | 2.79 inches | Total | 2.96 inches | Total | 0.52 inches | Total | 1.43 inches |

Irrigation (through July 2002):

Sprinkler irrigation was applied periodically between planting and root damage evaluation.

| | | | |
|---------|------------|--------|------------|
| June 25 | 1.0 inch | July 5 | 1.5 inches |
| 28 | 2.5 inches | 26 | 2.0 inches |

Experimental Formulations/Applications Evaluated - 2002

| Compound | Company |
|----------|---------|
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| | |
|-----------------|--------|
| Leverage 2.7 SE | Bayer |
| HM0117 1.15 G | Helena |
| HM2042B | Helena |
| Fortress 3.5 G | AMVAC |

Root Damage Evaluations

Table 1. 2002 Corn Rootworm Soil Insecticide Experiment 1.
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Root Damage Evaluation

| Insecticide | Rate/Placement ^a | Mean Root Damage | | Plant Stand Per 33.5 ft row ± SEM |
|----------------|-----------------------------|--------------------------------------|---------------|--|
| | | Rating ^b (1 - 6 scale) | (0 - 3 scale) | |
| Leverage 2.7SE | see footnote c | 2.00a | 0.06a | 49.8± 1.1 |
| Aztec 4.67G | 0.14 I smartbox appl. | 2.30ab | 0.09a | 48.5± 0.6 |
| Aztec 2.1G | 0.141 TB | 2.55a-c | 0.21a | 47.5± 1.7 |
| Capture 2EC | see footnote d | 2.60a-c | 0.26ab | 48.3± 0.9 |
| Regent 4SC | see footnote e | 2.70a-d | 0.44a-c | 48.5± 0.9 |
| Aztec 4.67G | 0.14 TB smartbox appl. | 2.75a-d | 0.25ab | 46.0± 1.8 |
| Lorsban 15G | 1.2 TB | 2.80a-d | 0.44a-c | 47.5± 1.2 |
| Force 3G | 0.12 TB | 2.80a-d | 0.43a-c | 47.8± 1.2 |
| Fortress 3.5G | 0.18 I smartbox appl. | 2.90a-e | 0.46a-c | 47.3± 0.9 |

| | | | | |
|---------------|-----------------------|----------|---------|-----------|
| Counter 20CR | 1.2 TB | 3.15a-e | 0.72a-c | 44.0± 2.0 |
| Fortress 5G | 0.18 I smartbox appl. | 3.20a-e | 0.65a-c | 50.3± 0.9 |
| HM2042B | see footnote f | 3.30a-f | 0.68a-c | 47.5± 1.4 |
| Counter 20CR | 1.2 I | 3.40b-f | 0.98a-d | 47.8± 0.9 |
| Lorsban 15G | 1.2 I | 3.45 b-f | 0.89a-d | 45.5± 1.2 |
| Fortress 2.5G | 0.18 I | 3.55b-f | 1.07a-e | 45.5± 1.3 |
| HM0117 1.15G | 0.068 I | 3.65c-f | 1.02a-d | 46.8± 1.5 |
| HM0117 1.15G | 0.09 TB | 4.00d-g | 1.31b-e | 45.3± 2.0 |
| HM0117 1.15G | 0.09 I | 4.00d-g | 1.36c-e | 48.5± 0.5 |
| HM0117 1.15G | 0.068 TB | 4.15e-g | 1.48c-e | 46.0± 1.1 |
| Thimet 20G | 1.2 TB | 4.15e-g | 1.40c-e | 45.8± 0.9 |
| Untreated | | 4.60fg | 1.82de | 44.8± 0.9 |
| Untreated | | 5.10g | 2.15e | 45.0± 1.8 |

^a placement:

TB = t-Band, 7-inch band placed over the open seed furrow;
I = placed in the open seed furrow;

^b Root rating scales used: 1 - 6 scale (Hills and Peters 1971); 0 - 3 scale (J. Oleson, Iowa State University); Within columns, mean root rating values followed by the same letter are not significantly different from each other (Fisher's protected LSD test @ 0.05 significance level).

^c Leverage 2.7 SE rate: 1.68 oz ai/1000 ft row; volume: 5 gallons water/A, TB application.

^d Capture 2EC rate: 0.075 oz ai/1000 ft row; volume: 5 gallons water/A, TB application.

^e Regent 4SC rate: 0.13 lb ai/A; volume: 4 gallons water/A through microtube into open seed furrow.

^f HM2042B rate: 0.34 oz formulation/1000 ft row; volume: 2 gallons water/A through microtube into open seed furrow.

