# 2007 CORN ROOTWORM SOIL INSECTICIDE EFFICACY / YIELD EXPERIMENT

Data Summary

University of Nebraska
Agricultural Research and Development Center
Mead, Nebraska

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Background information pertaining to the experiment conducted at the ARDC, near Mead, Nebraska during 2007.

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Agronomic

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| Hybrids: | Pioneer hybrid 31G66 |
| Row Spacing: | 30 inches |
| Planting Date: | 1 May 2007 |
| Planter: | Kinze model 2100, 4 row |
| Planting Depth: | 2 inches |
| Application Equipment: | Granular insecticide<br>Planting: planter mounted cone-belt system<br>Liquid insecticide<br>Planter mounted $CO_2$ pressurized sprayer |
| Field Preparation: | 20 April 2007 - chopped and disked, 23 April 2007 - disked |
| Herbicides Applied: | 2 May 2007: 2.4 qt BicepII Mag<br>15 June 2007: Spirit 1.0 oz/ac |
| Fertilizer Applied: | 150 lb. N per acre applied as $NH_3$, 23 April 2007 |
| Previous Crop: | Continuous corn (trap crop) |

Soil Information:

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|---|---|
| Type: | Silty clay loam |
| Ph: | 6.4 |
| CEC: | 29.4 |
| % organic matter: | 2.8 |
| % clay: | 29.05 |
| % silt: | 66.67 |
| % sand: | 4.28 |

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|---|---|
| Plant Population: | There were no significant differences ($P > 0.05$) among treatment stand count means at harvest (October 2007). The overall mean number of plants per acre $\pm$ SEM = 29,056 $\pm$ 279. |
| Insecticide History: | Insecticide free: 2000, 2002, 2004, 2006<br>Multiclass soil insecticide trials: 1999, 2001, 2003, 2005 |

Entomological

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|---|---|
| Species present: | Northern corn rootworm, *Diabrotica barberi* Smith and |

Lawrence, and western corn rootworm, *D. virgifera virgifera* LeConte (predominantly western corn rootworm). Initial rootworm egg hatch occurred 25 May 2007.

Root Evaluation: 0-3 root rating scale (Oleson et al. 2005) was used to evaluate larval corn rootworm damage in each treatment. Five roots per replication were evaluated in each treatment.

Root Evaluation Date: 26 July 2007

## Experimental Design

Design: Randomized complete block design
Replicated four times
Four-row treatments

Row Length: 40 feet

Statistical Analysis: Root ratings, stand, lodging, yield: Used SAS Mixed Procedure; Protected LSD test was used for mean separation ($P \leq 0.05$) .

## Environmental

### Conditions at planting:

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|---|---|
| Air temperature: | 25°C |
| Wind speed: | 10-15 mph at 5 ft height |
| Wind direction: | N-NE |
| Soil temperature 2" depth: | 25°C |
| Soil temperature surface: | 28°C |
| Soil moisture, 0-3" depth: | 20.1% (gravimetric method) |
| % cloud cover: | 30 % |
| % relative humidity: | 45% |
| Residue on surface: | 20% of soil surface covered with crop residue; soil moist, good planting bed |

2007 Rainfall

| | | |
|---|---|---|
| April | 01 | 0.01 inch |
| | 02 | 0.18 |
| | 22 | 0.21 |
| | 23 | 0.01 |
| | 24 | 2.71 |
| | 25 | 0.35 |
| Total | | **3.47** |
| | | |
| May | 03 | 0.12 inch |
| | 04 | 0.04 |
| | 05 | 2.52 |
| | 06 | 1.01 |
| | 07 | 0.03 |
| | 14 | 0.39 |
| | 15 | 0.17 |
| | 22 | 0.02 |
| | 23 | 0.40 |
| | 24 | 0.84 |
| | 26 | 0.17 |
| | 27 | 0.01 |
| | 28 | 0.03 |
| | 29 | 0.03 |
| | 30 | 0.03 |
| | 31 | 0.47 |
| Total | | **6.28** |
| | | |
| June | 02 | 0.14 inch |
| | 03 | 0.18 |
| | 04 | 0.15 |
| | 06 | 0.02 |
| | 13 | 0.97 |
| | 14 | 0.02 |
| | 22 | 0.10 |
| Total | | **1.58** |
| | | |
| July | 09 | 0.53 inch |
| | 12 | 0.06 |
| | 13 | 0.01 |
| | 15 | 0.01 |
| | 19 | 0.51 |
| | 27 | 0.21 |
| | 28 | 0.02 |
| Total | | **1.35** |

| | | |
|---|---|---|
| Aug | 01 | 0.13 inch |
| | 02 | 0.02 |
| | 05 | 0.21 |
| | 06 | 1.62 |
| | 07 | 0.04 |
| | 08 | 1.26 |
| | 09 | 0.50 |
| | 10 | 0.48 |
| | 12 | 2.02 |
| | 16 | 0.13 |
| | 17 | 0.02 |
| | 20 | 0.47 |
| | 22 | 0.44 |
| | 23 | 0.76 |
| | 28 | 1.16 |
| | 29 | 0.01 |
| Total | | **9.27** |
| | | |
| Sep | 06 | 0.01 inch |
| | 07 | 0.01 |
| | 10 | 0.15 |
| | 17 | 0.05 |
| | 18 | 1.19 |
| | 19 | 0.01 |
| | 24 | 0.41 |
| | 25 | 0.68 |
| Total | | **2.51** |

Irrigation (through August 2007):

Sprinkler irrigation was applied as needed throughout the season.

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|---|---|---|
| June | 26 | 1.00 inches |
| | 27 | 0.75 |
| July | 6 | 1.5 inches |
| | 17 | 0.5 |
| | 26 | 0.75 |

Table 1. 2007 Corn Rootworm Soil Efficacy and Yield Experiment
University of Nebraska Agricultural Research and Development Center, near Mead, NE

Root Damage Rating, Final Stand, Percentage Lodging, Yield ± SE

| Treatment | Treatment Rate/Placement[1] oz ai / 1000 ft (unless stated otherwise) | Mean Root Rating [2] 0 - 3 Scale | Percentage[3] Lodging | Bulk Yield[4] (bu. / acre) |
|---|---|---|---|---|
| Regent 4 SC | 0.13 lb ai/acre, I | 0.14 ± 0.03 a | 2.79 ± 1.1 | 212.3 ± 7.1 a |
| A14974 250CS | 0.12 TB | 0.18 ± 0.03 a | 2.27 ± 2.3 | 211.2 ± 8.6 a |
| Aztec 2.1G | 0.14 TB | 0.27 ± 0.06 ab | 1.55 ± 0.9 | 200.4 ± 7.1 ab |
| Aztec 2.1 G | 0.14 I | 0.27 ± 0.08 ab | 0.35 ± 0.4 | 219.0 ± 4.9 a |
| Force 3G | 0.12 I | 0.28 ± 0.09 ab | 1.86 ± 1.9 | 194.7 ± 7.4 b |
| A14974 250CS | 0.12 I | 0.32 ± 0.10 ab | 1.84 ± 1.4 | 211.5 ± 4.6 a |
| Capture 2EC | 0.075 I | 0.42 ± 0.16 ab | 4.26 ± 2.6 | 210.3 ± 5.4 a |
| Force 3G | 0.12 TB | 0.60 ± 0.23 bc | 1.28 ± 0.8 | 200.9 ± 6.0 ab |
| Capture 2EC | 0.075 TB | 0.74 ± 0.13 c | 0.78 ± 0.5 | 211.0 ± 4.1 a |
| Untreated | | 1.55 ± 0.15 d | 10.24 ± 6.3 | 195.3 ± 2.4 b |

Planting date: 1 May 2007; Plot size: four rows x 40 ft per treatment per replication, 4 replications; means within columns followed by the same letter are not significantly different (P > 0.05, Fishers Protected LSD Test).

[1] I=placement in open seed furrow; TB=T-band (7 inch band placed over open seed furrow); all liquid treatments applied in water at 5 gpa; Regent

treatment applied through microtube.

[2] Root evaluation date: 26 July 2007, rated 5 roots from two outside rows per treatment per replication using 0-3 node injury scale (Oleson et al. 2005)

[3] Percentage lodging = proportion of final stand leaning >45 degree angle from vertical x 100; there were no significant differences in mean plants lodged among treatments (P=0.2583)

[4] Bulk yield = : hand harvested and shelled middle 76 ft of the two inside rows / plot during October 2007, presented as bushels of corn @ 15.5% moisture