2004 CORN ROOTWORM SOIL INSECTICIDE EVALUATION[1]

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 2004.

Agronomic

Hybrid:	DKC 60-15
Row Spacing:	30 inches
Planting Date:	28 April 2004
Planter:	Kinze model 2100, 4 row cone
Planting Depth:	2 inches
Application Equipment:	Granular insecticides
	Planting: planter mounted cone-belt system or Smartbox system
	Liquid insecticides
	Planter mounted CO_2 pressurized sprayer

Field Preparation: 20 April 2004 - disked
Herbicides Applied: 29 April 2004: Harness Xtra, 2.5 qt/A, pre emerge
10 June 2004: 1.0 oz Permit + 0.67 oz Accent / A
Fertilizer Applied: 150 lb. N/A applied as NH_3, 15 April 2004
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: There were no significant differences ($P > 0.05$) among treatment stand count means or among abnormal plants per treatment at V3 growth stage (Hanway 1997). The overall mean number of plants/33.5' $\pm$ SEM = 44.84 $\pm$ 0.38.

Insecticide History: Insecticide free: 1997, 1999, 2001, 2003
Multiclass soil insecticide trials: 1996, 1998, 2000, 2002

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 22-23 May 2004 (predominantly western corn rootworm).

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

Root Evaluation Date: 14 July 2004

Experimental Design

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

Row Length: 33.5 feet

Statistical Analysis: Stand Counts, Root Ratings: Used SAS Mixed Procedure; Protected LSD test was used for mean separation ($P \leq 0.05$) .

Environmental

Conditions at planting:

Air temperature: 27°C

Wind speed: 20 mph at 5 ft height
Wind direction: SW
Soil temperature 2" depth: 18°C
Soil temperature surface: 24°C
Soil moisture, 0-3" depth: 13.5 % water (gravimetric method)
% cloud cover: 10 % cloud cover
% relative humidity: not recorded
Residue on surface: 20% of soil surface covered with crop residue; soil moist, mellow, good seed bed

Rainfall

April	09	0.039 inch
	18	0.039
	20	0.039
	24	0.787
Total		**0.904**

May	01	0.039 inch
	10	0.512
	12	0.039
	13	0.079
	14	0.039
	15	0.039
	16	0.039
	17	0.039
	18	0.118
	22	1.890
	24	0.236
	26	0.157
	29	1.063
Total		**4.289**

June	05	0.236 inch
	12	2.323
	13	0.079
	15	0.118
	18	0.236
	21	0.236
	24	0.039
Total		**3.267**

July	02	0.906 inch
	03	0.236
	05	0.157
	06	0.079
	07	0.354
	08	0.039
	11	0.118

	14	0.236
	22	0.039
	23	0.039
	24	0.039
	29	0.039
	30	0.039
Total		**2.320**

Irrigation (through July 2004):

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

July	02	1.0 inch
	20	1.0
	21	1.0
	30	1.5

Table 1. 2004 Corn Rootworm Soil Insecticide Experiment 1.
University of Nebraska Agricultural Research and Development Center, near Mead, NE

Root Damage Evaluation

Insecticide	Rate/Placement[a]	Mean Percentage[b] Lodged (± SE)	Mean Root Damage Rating[c] (1 - 6 Scale)	Mean Root Damage Rating[c] (0 - 3 Scale)
YieldGard Rootworm[d] + Poncho 250		0.00 + 0.00	1.95 a	0.05 a
Aztec 2.1 + Poncho 1250	0.07 TB	0.72 + 0.72	2.30 ab	0.15 ab
Aztec 3.78G	0.137 TB	1.22 + 1.22	2.45 abc	0.17 abc
Counter 15G	1.2 TB	0.66 + 0.66	2.50 abcd	0.12 ab
Regent 4 SC	see footnote e	0.00 + 0.00	2.55 abcd	0.18 abc
Fortress 2.5G	0.20 I	2.33 + 1.61	2.55 abcd	0.23 abc
Aztec 2.1G	0.141 TB	2.53 + 1.81	2.60 bcde	0.29 abc
Force 3G	0.12 TB	1.97 + 1.26	2.75 bcdef	0.24 abc
Aztec 4.67G	0.14 TB smartbox appl.	5.37 + 3.13	2.95 cdef	0.36 abc
Lorsban 4E	see footnote f	1.80 + 1.12	3.10 defg	0.51 abcd
Force 3G	0.12 TB smartbox appl.	7.64 + 4.07	3.10 defg	0.52 abcd
Lorsban 15G	1.2 TB	3.75 + 3.75	3.10 defg	0.52 abcd
Poncho 1250	1.25 mg ai/seed	0.70 + 0.70	3.20 efgh	0.57 bcd
Capture 2EC	see footnote g	2.58 + 1.86	3.25 fghi	0.67 cd
Cruiser 5 FS	1.25 mg ai/seed	14.75 + 5.98	3.70 ghi	1.01 de
Capture 2EC	see footnote h	12.63 + 10.33	3.75 hij	1.18 e
Thimet 20G	1.2 TB	38.73 + 20.80	3.85 ij	1.24 e

Fipronil ST	50 g ai/100 kg seed	40.22 + 16.97	4.35	j	1.75	f
Untreated (1)	------	57.84 + 17.37	5.00	k	2.34	g
Untreated (2)	------	70.17 + 11.36	5.10	k	2.32	g

[a] Rate presented as oz ai per 1000 row ft except where other units listed:
TB = T-band, 7-inch band placed over the open seed furrow;
I = placed in the open seed furrow;
ST = seed treatment.

[b] On 30 August 2004, there were no significant differences (P > 0.05) in final stand count means; the final overall mean number of plants per 33.5 ft + SEM = 39.99 + 0.38. The mean percentage of final stands that were lodged are presented by treatment (lodged = plant leaning > 45° angle from vertical).

[c] 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).

[d] YieldGard Rootworm: hybrid expresses Cry3Bb1 Bt-toxin.

[e] Regent 4SC rate: 0.13 lb ai/A; volume: 5 gallons water/A through microtube into open seed furrow

[f] Lorsban 4E rate: 1.2 oz ai/1000 ft; volume: 5 gallons water/A, TB application

[g] Capture 2EC rate: 0.09 oz ai/1000 ft; volume: 5 gallons water/A, TB application

[h] Capture 2EC: rate: 0.09 oz ai/1000 ft, volume: 5 gallons 10/34/0 starter fertilizer/A, microtube infurrow application