

Evaluation of Seed Treatments for Larval Corn Rootworm Control

Terry A DeVries, University of Nebraska, South Central Ag Laboratory, Clay Center, NE 68933

Robert J Wright, Dept. Of Entomology, University of Nebraska-Lincoln, Lincoln NE 68583-0816, rwright2@unl.edu

Background information pertaining to corn rootworm experiments conducted at Clay Center, NE during 2008.

Agronomic

Hybrid (Traits):	unknown (Roundup Ready®)
Row Spacing:	30 inches
Row Orientation:	North-South
Planting Date:	05 May 2008
Planter:	Slot-planted with 4-row Kinze planter with finger pickup units.
Planting Depth:	2 inches
Application Equipment:	<u>Seed Treatments:</u> All were applied commercially.
Previous Crop:	Late planted corn
Soil Information:	Crete silt loam
Herbicides Applied:	Broadcasted: Keystone® @ 2.65 Qt/acre, Roundup WeatherMax® @ 26 fl oz/acre and AMS @ 17 lbs/100 gal solution on 06 May 2008. Broadcasted: Roundup WeatherMax® @ 26 fl oz/acre and AMS @ 17 lbs/100 gal solution on 30 May 2008.
Fertilizer Applied:	170 lbs of N knifed in as NH ₃ on 16 April 2008. 5 GPA of 10-34-0 starter fertilizer was applied in furrow at planting.

Data Collection:

Plant Population:	The total number of plants per plot were recorded at emergence (21 May), V1 growth stage (29 May) and 1 week after V1 (June 04) and converted to plants per acre.
Extended Leaf Height:	Extended leaf heights were recorded in inches from 20 randomly selected plants per plot on 19 June 2008.
Broken Plants:	A wind event (45 mph) on June 26 caused stalk breakage. The total number of broken (brittlesnapped) plants per plot were recorded on 02 July and later converted to plants per acre.
Lodged Plants:	The total number of lodged plants per plot were recorded on 09 July and 24 September 2008 and later converted to percentage of plants lodged.
Harvest Evaluations:	Plots were machine harvested on 29 October 2008. Percent moisture and lbs of grain were recorded and converted to 56 lbs/bu @ 15% moisture to evaluate yield.

Entomological Data:

Species present:	Predominantly western corn rootworm, <i>Diabrotica virgifera virgifera</i> LeConte, and a few northern corn rootworm, <i>D. barberi</i> Smith and Lawrence.
CRW egg hatch:	First observed on 02 June 2008.
Root Evaluation:	Iowa 0-3 root damage scale was used to evaluate larval corn rootworm injury in each treatment per replication. Five randomly selected plants were dug from each plot.
Root Evaluation Date:	17 July 2008

Experimental Design

Design:	Randomized Complete Block Replicated four times
Plot Size:	4 rows x 30 feet
Statistical Analyses:	PROC MIXED, with mean separation using the differences of least square means (MIXED; $p t >0.05$).

Environmental

Conditions at planting:	
Wind direction and speed:	S @ 8-12 mph
Soil surface condition:	Excellent
Subsoil moisture:	Excellent

Record of Rainfall: (April 1 - October 29)

<u>Date</u>	<u>Amount (Inches)</u>	<u>Date</u>	<u>Amount (Inches)</u>
April 3	0.41	July 10	1.85
April 8	0.18	July 12	0.25
April 10	1.21	July 15	0.20
April 17	0.80	July 16	2.14
April 18	1.15	July 18	1.15
April 24	0.30	August 6	0.30
April 26	0.30	August 9	1.45
May 6	1.31	August 12	0.45
May 8	0.26	August 14	0.15
May 10	1.13	August 23	0.23
May 21	0.25	September 1	1.02
May 22	1.45	September 8	0.65
May 23	1.01	September 11	0.25
May 26	0.10	September 12	0.25
May 27	0.26	October 6	1.60
May 29	0.10	October 13	1.40
June 4	1.10	October 14	0.95
June 5	0.15	October 21-23	2.80
June 7	0.26		
June 11	0.35		
June 24	1.29		
June 27	0.45		

<u>Month</u>	<u>Total (Inches)</u>
April	4.35
May	5.87
June	3.60
July	5.59
August	2.58
September	1.92
October	<u>6.75</u>
Total	30.66

Seasonal Record of Irrigation:

<u>Date</u>	<u>Amount (Inches)</u>	<u>Month</u>	<u>Total (Inches)</u>
July 31	1.70	July	1.70
August 6	1.71	August	<u>3.29</u>
August 26	<u>1.58</u>	Total	4.99
Total	4.99		

Evaluation of Seed Treatments for Larval Corn Rootworm Control

Seed Treatment	Rate	Yield ¹ (bu/acre) (29 Oct.)	Avg. Root Ratings ¹ (0-3 Scale) (17 July)	% Root Lodging ¹ (24 Sept.)	% Root Lodging ¹ (09 July)	Avg. No. Of Broken Plants Per Acre ¹ (02 July)	Avg. Extended Leaf Height ¹ (Inches) (19 June)
Regent[®] 500TS + Poncho[™] 600	34 g ai/100000 seed + 50 g ai/100000 seed	219.4	0.75	16.2	4.7	495	38.6
Poncho [™] 600	125 g ai/100000 seed	215.0	1.23	27.0	7.3	485	38.1
Regent[®] 500TS + Gaucho 600 FS	34 g ai/100000 seed + 38 g ai/100000 seed	214.3	0.70	13.7	2.2	636	38.6
Regent [®] 500TS + Poncho [™] 600	50 g ai/100000 seed + 50 g ai/100000 seed	208.8	1.61	30.8	8.1	709	37.8
Regent[®] 500TS	34 g ai/100000 seed	203.0	1.61	49.5	13.3	500	38.2
Untreated	-----	209.7	1.70	40.0	16.7	531	37.7
	<i>Treatment Probability</i>	<i>0.8101</i>	<i>0.1742</i>	<i>0.0645</i>	<i>0.2343</i>	<i>0.9631</i>	<i>0.4345</i>

¹Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).

Evaluation of Seed Treatments for Larval Corn Rootworm Control

Seed Treatment	Rate	Avg. No. Of Plants Per Acre ¹ (04 June)	Avg. No. Of Plants Per Acre ¹ (29 May)	Avg. No. Of Plants Per Acre ¹ (21 May)
Regent[®] 500TS + Poncho[™] 600	34 g ai/100000 seed + 50 g ai/100000 seed	27,355	27,631	23,938
Poncho [™] 600	125 g ai/100000 seed	28,588	27,484	24,168
Regent[®] 500TS + Gaucho 600 FS	34 g ai/100000 seed + 38 g ai/100000 seed	27,380	27,371	24,889
Regent [®] 500TS + Poncho [™] 600	50 g ai/100000 seed + 50 g ai/100000 seed	27,622	27,282	23,312
Regent[®] 500TS	34 g ai/100000 seed	29,432	29,450	24,996
Untreated	-----	28,340	27,722	22,839
	<i>Treatment Probability</i>	<i>0.4718</i>	<i>0.4617</i>	<i>0.5173</i>

¹Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05).