

Evaluation of Bt Transgenic Corn Hybrids, Seed Treatments and Soil Insecticide For Larval CRW Control

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Background information pertaining to corn rootworm experiments conducted at Clay Center, NE during 2007.

Agronomic

Hybrids (Traits):	Pioneer 33D14 (Herculex [®] XTRA) and Pioneer 33D12 (Herculex [®] I).
Row Spacing:	30 inches
Row Orientation:	North-South
Planting Date:	01 May 2007
Planter:	No-till slot-planted on top of established ridge with 4-row 7300 JD Maximerge vacuum planter.
Planting Depth:	2 inches
Application Equipment:	<u>Granular Insecticides:</u> Standard insecticide boxes were used to apply Force 3G in a t-band application at 4 oz product/1000 row ft. <u>Seed Treatments:</u> All were applied commercially.
Previous Crop:	Late planted corn
Soil Information:	Crete silt loam
Herbicides Applied:	Broadcasted: Radius @ 18 fl oz/acre, Atrazine 90DF @ 1.25 lbs/acre, Roundup OriginalMax @ 22 oz/acre and AMS @ 17 lbs/100 gal solution on 02 May 2007. Broadcasted: Atrazine 90DF @ 1.25 lbs/acre on 08 June 2007.
Fertilizer Applied:	150 lbs of N knifed in as NH ₃ on 16 April 2007. 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 on 21 May 2007.

Extended Leaf Height: Extended leaf heights were recorded in inches from 20 randomly selected plants per plot on 19 June 2007.

Lodged Plants: The total number of lodged plants per plot were recorded on 10 July 2007.

Harvest Evaluations: Plots were machine harvested on 03 October 2007. Percent moisture and lbs of grain were recorded and converted to 56 lbs/bu @ 15.5% moisture to evaluate yield.

Entomological Data:

Species present: Predominantly western corn rootworm, *Diabrotica virgifera virgifera* LeConte, and a few northern corn rootworm, *D. barberi* Smith and Lawrence.

CRW egg hatch: First observed on 25 May 2007.

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: 12 July 2007

Experimental Design

Design: Randomized Complete Block
Replicated six times

Plot Size: 4 rows x 145 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: N-NE @ 15 mph

Soil surface condition: Excellent

Subsoil moisture: Moist-Excellent

Record of Rainfall: (April 1 - October 4*)

<u>Date</u>	<u>Amount (Inches)</u>	<u>Month</u>	<u>Total (Inches)</u>
April 1	0.80	April	3.85
April 10	0.55	May	4.17
April 24	2.50	June	1.85
May 6	1.75	July	3.80
May 15	1.40	August	3.70
May 23	0.60	September	2.50
May 28	0.25	October*	<u>1.85</u>
May 30	0.17	Total	21.72
June 13	0.55		
June 14	0.70		
June 18	0.60		
July 9	2.25		
July 16	0.75		
July 19	0.10		
July 30	0.70		
August 23	2.45		
August 29	1.25		
September 7	1.00		
September 10	0.25		
September 17	0.90		
September 24	0.35		
October 1	0.25		
October 4	<u>1.60</u>		
Total	21.72		

Seasonal Record of Irrigation:

<u>Date</u>	<u>Amount (Inches)</u>	<u>Month</u>	<u>Total (Inches)</u>
June 30	1.45	June	1.45
July 17	0.66	July	2.03
July 27	1.37	August	<u>4.10</u>
August 7	1.36	Totals	7.58
August 16	1.36		
August 21	<u>1.38</u>		
Total	7.58		

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For Larval CRW Control**

Hybrid	Trait(s) ¹	Seed Treatment	Insecticide Application ²	Yield ³ (bu/acre) (03 October)	Avg.	Avg. No. of Lodged Plants ³ (10 July)	Avg. Extended Leaf Height ³ (Inches) (19 June)	Avg. No. Of Plants Per Acre ³ (21 May)
					Root Ratings ³ (0-3 Scale) (12 July)			
Pioneer 33D14	HXX	Poncho 250	-----	198.7 a	0.18 a	10.8 a	43.2 a	30,241 a
Pioneer 33D12	HX1	Poncho 250	Force 3G	188.8 ab	0.77 ab	62.7 a	42.0 ab	28,721 b
Pioneer 33D12	HX1	Poncho 1250	-----	176.1 b	1.37 bc	193.2 b	41.8 ab	26,649 c
Pioneer 33D12	HX1	Poncho 250	-----	141.9 c	1.79 c	276.5 b	40.3 b	28,716 b
Treatment Probability				0.0001	0.0020	0.0002	0.0183	<0.0001

¹HXX; contains Herculex[®] I and the Herculex[®] Rootworm genes and HX1; contains Herculex[®] I insect protection.

²Force 3G applied at 4 oz product/1000 row ft in a t-band placement via standard insecticide boxes.

³Means in column followed by the same lowercase letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05).