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**CORN:** *Zea mays* L. 'Mycogen 2T780', 'Mycogen 2T785', 'Mycogen 2T787'

**YIELD AND EFFICACY RESPONSES OF BT TRANSGENIC CORN ROOTWORM  
HYBRIDS AND LORSBAN 15G AT PLANTING TO NITROGEN FERTILIZER  
APPLICATION RATES, 2008**

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Western corn rootworm (WCR): *Diabrotica virgifera virgifera* LeConte

Northern corn rootworm (NCR): *Diabrotica barberi* Smith and Lawrence

Planting time soil insecticide, corn rootworm resistant trait and nitrogen fertilizer trials were conducted near Clay Center, NE to evaluate their effectiveness for larval corn rootworm (CRW) control and corresponding yield response in field corn. Local population consists predominately of WCR (>95% of total). Trial site was late-planted corn (insecticide free) during 2007. Soil type was a Crete silt loam. Experimental design was a split plot with 4 replicates. Main plots (nitrogen [N] fertilizer rates) were 16 rows x 65 ft length (N-S row orientation) in 30-inch row spacing. Three application rates of liquid N (0 lbs, 80 lbs, 160 lbs) in the form of 28% UAN fertilizer were broadcast per acre on 08 Apr. Split plots (CRW treatments) were 4 rows x 65 ft length. ‘Mycogen 2T787’ (HXX; contains Herculex<sup>®</sup> XTRA and LibertyLink<sup>®</sup> genes), ‘Mycogen 2T780’ (HX1; contains Herculex<sup>®</sup> I and LibertyLink<sup>®</sup> genes) and ‘Mycogen 2T785’ (YGPI; contains YieldGard<sup>®</sup> Plus and Roundy Ready<sup>®</sup> 2 genes) corn hybrids were planted on 30 Apr 2008 with a 4-row JD 7300 Maximerge vacuum planter. These transgenic hybrids possess the same base genetics. Lorsban 15G granular insecticide was applied at planting in a t-band application at a rate of 8 oz product per 1000 row ft. A southeast wind @ 10-20 mph occurred at planting. Plant populations were evaluated on 20 May. The total number of plants per plot was recorded and converted to plants per acre. CRW egg hatch was first observed on 02 Jun. Extended leaf heights (inches) of 20 randomly selected plants per plot were recorded on 16 Jun. The total number of lodged plants per plot was recorded on 09 Jul and converted to % root lodging. Larval feeding damage was evaluated on 14 Jul. Ten randomly selected plants were

dug from each plot, washed, and rated using the Iowa State 0-3 scale (0 = no feeding, 1 = one node of roots pruned to within 1.5 inches of the stalk, 2 = two nodes of roots pruned to within 1.5 inches of the stalk, 3 = 3 or more nodes of roots pruned to within 1.5 inches of the stalk). The total number of lodged plants per plot was also recorded on 30 Sept and converted to % root lodging. Plots were machine harvested on 04 Nov. Percent moisture and lbs of grain were recorded and corrected to 56 lbs/bu @ 15% moisture. Data were analyzed by ANOVA with mean separation using differences of least square means ( $P = 0.05$ ).

From planting (30 Apr) to larval feeding damage evaluation (14 Jul), precipitation totaled 11.57 inches. Larval rootworm densities were high, with mean root injury ratings in the HXI plots averaging 1.43. Yield levels were significantly enhanced with higher application rates of N fertilizer. In addition, early season crop growth rates were significantly enhanced with N rates of 80 lbs and 160 lbs compared to the 0 N rate plots. YGPI, HXX and HXI + Lorsban 15G plots provided significantly greater root injury protection and reduced both early and late season root lodging compared to the HXI plots. Only the YGPI plots significantly enhanced yield levels compared to the HXI plots. N application rate\*CRW treatment did not result in any statistically significant treatment differences based on root injury ratings or final yield levels.

Table 1

Main Treatment <sup>1</sup>	Plants/Acre <sup>3</sup>	Leaf Height <sup>2</sup>	Early Season % Root Lodging	Root Injury Rating <sup>3</sup>	Late Season % Root Lodging <sup>3</sup>	Yield Bu/Acre <sup>2</sup>
160 lbs N	26,744	31.8 a	0.4	0.62	14.6	198.9 a
80 lbs N	26,739	30.7 a	0.9	0.65	25.5	168.9 b
0 lbs N	26,607	28.4 b	0.4	0.80	30.2	138.2 c

P 0.9376 0.0025 0.4443 0.5177 0.0914 0.0016

<sup>1</sup>Per acre rates of liquid nitrogen broadcast on 08 Apr in the form of 28% UAN fertilizer.

<sup>2</sup>Means in column with the same lowercase letter are not statistically different using the differences of least square means (MIXED; p|t|>0.05.

<sup>3</sup>Means in column are not statistically different using the differences of least square means (MIXED; p|t|>0.05.

Table 2

Split Treatment <sup>1</sup> /Formulation	Plants/Acre <sup>3</sup>	Leaf Height <sup>4</sup>	Early Season % Root Lodging <sup>3</sup>	Root Injury Rating <sup>3</sup>	Late Season % Root Lodging <sup>3</sup>	Yield Bu/Acre <sup>3</sup>
YGPI	28,104 a	30.5	0.1 a	0.32 a	5.3 a	178.3 a
HXX	25,717 c	30.8	0.0 a	0.22 a	0.1 a	171.3 ab
HX1 + Lorsban 15G <sup>2</sup>	25,844 c	29.8	0.1 a	0.80 b	22.6 b	165.7 ab
HXI	27,123 b	30.1	2.1 b	1.43 c	65.8 c	160.7 b

P <.0001 0.1171 0.0004 <.0001 <.0001 0.0282

<sup>1</sup>HXX; ‘Mycogen 2T787’ corn hybrid containing Herculex<sup>®</sup> XTRA and LibertyLink<sup>®</sup> genetic traits, HXI; ‘Mycogen 2T780’ corn hybrid containing Herculex<sup>®</sup> I and LibertyLink<sup>®</sup> genetic traits and YGPI; ‘Mycogen 2T785’ corn hybrid containing YieldGard<sup>®</sup> Plus and Roundy Ready<sup>®</sup> 2 genetic traits.

<sup>2</sup>Lorsban 15G granules applied at planting in a t-band application at a rate of 8 oz product per 1000 row ft.

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

<sup>4</sup>Means in column are not statistically different using the differences of least square means (MIXED;  $p|t|>0.05$ ).

Table 3

Main Treatment <sup>1</sup>	Split Treatment <sup>2</sup> / Formulation	Plants/ Acre <sup>5</sup>	Leaf Height <sup>5</sup>	Early Season % Root Lodging <sup>5</sup>	Root Injury Rating <sup>5</sup>	Late Season % Root Lodging <sup>4</sup>	Yield Bu/Acre <sup>5</sup>
160 lbs N	YGPI	28,420	32.1	0.0	0.25	2.3 ab	205.4
160 lbs N	HXI + Lorsban 15G <sup>3</sup>	25,765	31.4	0.3	0.63	6.7 ab	199.4
160 lbs N	HXX	25,817	32.3	0.0	0.19	0.0 a	198.5
160 lbs N	HXI	26,975	31.2	1.3	1.41	49.4 d	192.4
80 lbs N	YGPI	28,194	30.4	0.1	0.26	2.1 a	182.9
80 lbs N	HXX	25,944	30.9	0.0	0.21	0.0 a	173.6
80 lbs N	HXI + Lorsban 15G <sup>3</sup>	25,902	30.7	0.0	0.70	20.6 bc	171.9
80 lbs N	HXI	26,918	30.9	3.6	1.46	79.5 e	151.1
0 lbs N	YGPI	27,698	28.9	0.3	0.46	11.6 ab	146.7
0 lbs N	HXX	25,389	29.3	0.0	0.26	0.3 a	141.8
0 lbs N	HXI	27,476	28.1	1.4	1.42	68.6 e	138.7
0 lbs N	HXI + Lorsban 15G <sup>3</sup>	25,867	27.4	0.0	1.07	40.5 cd	125.7

P 0.8913 0.5609 0.3459 0.9093 0.0257 0.4456

<sup>1</sup>Per acre rates of liquid nitrogen broadcast on 08 Apr in the form of 28% UAN fertilizer.

<sup>2</sup>HXX; ‘Mycogen 2T787’ corn hybrid containing Herculex<sup>®</sup> XTRA and LibertyLink<sup>®</sup> genetic traits, HXI; ‘Mycogen 2T780’ corn hybrid containing Herculex<sup>®</sup> I and LibertyLink<sup>®</sup> genetic traits and YGPI; ‘Mycogen 2T785’ corn hybrid containing YieldGard<sup>®</sup> Plus and Roundy Ready<sup>®</sup>

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<sup>5</sup>Means in column are not statistically different using the differences of least square means (MIXED;  $p|t|>0.05$ ).

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<b>Brand Name</b>	<b>Formulation</b>	<b>Common Name</b>	<b>Composition</b>	<b>Manufacturer</b>
Lorsban	15G	chlorpyrifos	<i>O,O</i> -diethyl <i>O</i> -3,5,6-trichloro-2-pyridyl phosphorothioate	Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, IN 46268