



CORN

SECTION 4

Comparison of experimental and commercially available transgenic rootworm hybrids and granular insecticides to control corn rootworm larvae (*Diabrotica spp.*) in Illinois, 2008

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Location

We established one trial at the University of Illinois Agricultural Engineering Farm near Urbana (Champaign County).

Experimental Design and Methods

The experimental design was a randomized complete block with four replications. The plot size for each hybrid was 20 ft (eight rows) x 30 ft. Five randomly selected root systems were extracted from the center two rows of each eight-row plot on 1 and 26 August. The root systems were washed and rated for corn rootworm larval injury using the 0 to 3 node-injury scale developed by Oleson et al. (2005) (Appendix I).

Planting Information

The trial was planted on 22 May using a four-row, Almaco constructed planter with John Deere 7300 row units. Precision cone units were used to plant the seeds. Granular insecticides were applied through modified Noble metering units mounted to each row of the planter. Plastic tubes directed the insecticide granules to either a 5-inch, slope-compensating bander or into the seed furrow. All insecticides were applied in front of the planter's firming wheels. Cable-mounted tines were attached behind each of the planter row units to improve insecticide incorporation.

Agronomic Information

Agronomic information is listed in Table 4.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 7 (Agricultural Research Manager), revision 7.4.2. (Copyright© 1982–2007 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

The mean node-injury ratings taken on two dates are presented in Table 4.2. The mean node-injury ratings in the non-Bt check were 2.36 and 2.63 on 1 and 26 August, indicating that corn rootworm larval injury was severe.

The mean node-injury ratings for all rootworm control products were significantly lower than the mean node-injury rating for the non-Bt check on both 1 and 26 August. On 1 August, YieldGard VT3 Pro/Herculex RW and YieldGard VT/RR2 + Aztec 2.1G had significantly less corn rootworm larval injury than Herculex XTRA/RR2 and the non-Bt check. On 26 August, SmartStax, YieldGard VT3 Pro/Herculex RW, and YieldGard VT/RR2 + Aztec 2.1G had significantly less corn rootworm larval injury than Herculex XTRA/RR2 and the non-Bt check. The mean node-injury ratings for the non-Bt corn hybrid (Roundup Ready 2) treated with Aztec 2.1G were not significantly different from the mean node-injury ratings for YieldGard VT/RR2 + Aztec 2.1G, YieldGard VT/RR2, YieldGard VT3 Pro/Herculex RW, and SmartStax on either 1 or 26 August. All of the granular insecticides and transgenic hybrids performed well, with node-injury scores not exceeding 0.66 by the second evaluation date.

TABLE 4.1 • Agronomic information for efficacy trial of experimental and commercially available transgenic rootworm hybrids and granular insecticides to control corn rootworm larvae, Urbana, University of Illinois, 2008

Planting date	22 May
Root evaluation dates	1 and 26 August
Row spacing	30 inches
Seeding rate	33,000/acre
Previous crop	Trap crop (late-planted corn and pumpkins)
Tillage	Fall—chisel plow Spring—field cultivator



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TABLE 4.2 • Evaluation of experimental and commercially available transgenic rootworm hybrids and granular insecticides for control of corn rootworm larvae, Urbana, University of Illinois, 2008

Treatment/transgenic trait	Rate ¹	Placement	Mean node-injury rating ^{2,3,4} 1 August	Mean node-injury rating ^{2,3,4} 26 August
Roundup Ready 2 (non-Bt check)	—	—	2.36 a	2.63 a
Roundup Ready 2 + Aztec 2.1G	6.7	Band	0.29 bc	0.25 cd
YieldGard VT/RR2 + Aztec 2.1G	6.7	Band	0.02 c	0.01 d
YieldGard VT/RR2	—	—	0.37 bc	0.48 bc
YieldGard VT3 Pro/Herculex RW ⁵	—	—	0.01 c	0.05 d
Herculex XTRA/RR2	—	—	0.54 b	0.66 b
SmartStax	—	—	0.04 bc	0.03 d

¹ Rates of application for granular insecticides are ounces (oz) of product per 1,000 ft of row.

² Mean node-injury ratings are based on the 0 to 3 node-injury scale (Oleson et al. 2005, Appendix I).

³ Mean node-injury ratings were derived from five root systems per treatment in each of four replications.

⁴ Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).

⁵ Treatment combination was evaluated for experimental purposes only and is not commercially available.