SECTION 7

Evaluation of Bt hybrids and a seed-blend to control European corn borer larvae (*Ostrinia nubilalis*) in Illinois, 2011

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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 treatment was 10 ft (four rows) x 30 ft. A Davis inoculator was used to place approximately 90 neonate European corn borer larvae near the tip and base of the ear on 10 consecutive plants in row two of each plot on 26 July (at the R1 growth stage). Densities of European corn borer larvae were assessed on 26 August (31 days after infestation [DAI]). Densities were estimated by splitting the stalks of 10 plants in each plot and counting the total number of larvae. The number and total length of tunnels that were present were also recorded for each plant evaluated.

Planting Information

The trial was planted on 12 May using a four-row, vacuum style planter constructed by Seed Research Equipment Solutions (SRES). Seeds were planted in 30-inch rows at an approximate depth of 1.75 inches.

Agronomic Information

Agronomic information is listed in Table 7.1.

Climatic Conditions

Temperature and precipitation data are presented in Appendix III.

Statistical Analysis

Data were analyzed using ARM 8 (Agricultural Research Manager), revision 8.3.4 (Copyright© 1982–2011 Gylling Data Management, Inc., Brookings, SD).

Results and Discussion

Means for the number of European corn borer larvae, number of tunnels, and tunnel length per plant are reported in Table 7.2.

No European corn borer larvae or tunnels were observed in any plot with SmartStax plants. Virtually no European corn borer larvae or tunnels were observed in any plot with YieldGard VT2 or YieldGard VT2 RIB plants, which provided statistically similar levels of protection as the SmartStax plants. The untreated checks (UTCs) had significantly more larvae and damage than any of the Bt hybrids. The DeKalb UTC had significantly more larvae and damage than the Mycogen UTC.

TABLE 7.1 • Agronomic information for efficacy trial of Bt hybrids and a seed-blend to control European corn borer larvae, Urbana, University of Illinois, 2011

Planting date	12 May
Hybrids	DKC63-25 YieldGard VT2 DKC63-25BJW YieldGard VT2 RIB[1] DKC63-45 RR2 Mycogen 2T777 RR2 Mycogen 2T784 SmartStax
Row spacing	30 inches
Seeding rate	36,000/acre
Previous crop	Corn
Tillage	Fall—chisel plow Spring—field cultivator

[1] Refuge-in-the-bag (90% Bt seed, 10% non-Bt seed).

TABLE 7.2 • Evaluation of Bt hybrids and a seed-blend to control European corn borer larvae, Urbana, University of Illinois, 2011

Product	Mean no. of ECB[1] larvae per ear[2,3]	Mean no. of tunnels per plant[3,4]	Mean tunnel length per plant[3,5]
SmartStax (Mycogen 2T784[6])	0.00 c	0.00 c	0.00 c
YieldGard VT2 (DKC63-25[7])	0.03 c	0.08 c	0.30 c
YieldGard VT2 RIB[8] (DKC63-25BJW[9])	0.05 c	0.08 c	0.10 c
UTC[10] (DKC63-45[7])	2.50 a	4.55 a	15.58 a
UTC[10] (Mycogen 2T777[6])	1.33 b	2.68 b	8.83 b

[1] ECB = European corn borer.
[2] Means were derived from the numbers of larvae in 10 plants per treatment in each of four replications.
[3] Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).
[4] Means were derived from the numbers of tunnels in 10 plants per treatment in each of four replications.
[5] Means were derived from the total length of tunnels in 10 plants per treatment in each of four replications.
[6] Seed treated with Cruiser (thiamethoxam), 0.25 milligrams (mg) of active ingredient (a.i.) per seed.
[7] Seed treated with Poncho (clothianidin), 0.50 milligrams (mg) of active ingredient (a.i.) per seed.
[8] RIB = refuge-in-the-bag (90% Bt seed, 10% non-Bt seed).
[9] Seed treated with Poncho (clothianidin), 0.25 milligrams (mg) of active ingredient (a.i.) per seed.
[10] UTC = untreated check.