SECTION 6

Evaluation of Bt hybrids and a seed-blend to control corn earworm larvae (*Helicoverpa zea*) 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. Plot size for each treatment was 10 ft (four rows) x 30 ft. Densities of ear-feeding lepidopteran pests (fall armyworms, corn earworms, and European corn borers) were assessed on 25 August (at the R3 growth stage); only corn earworm larvae were present. Densities were estimated by counting the total number of larvae on 10 ears in each plot. The number of kernels consumed was recorded for each ear that was evaluated.

Planting Information

The trial was planted on 13 June using a four-row, vacuum style planter constructed by Seed Research Equipment Solutions (SRES). The planting date was later than normal to attract late-season flights of corn earworm. Seeds were planted in 30-inch rows at an approximate depth of 1.75 inches.

Agronomic Information

Agronomic information is listed in Table 6.1.

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

The mean number of corn earworm larvae and kernels consumed per ear are reported in Table 6.2.

Densities of corn earworm larvae were small at the time of sampling. Both untreated checks (UTCs) had significantly more corn earworm larvae and kernels consumed per ear than SmartStax or YieldGard VT2 plants. The DeKalb UTC (DKC63-45) had significantly more kernels consumed per ear than any other hybrid in the trial.

TABLE 6.1 • Agronomic information for efficacy trial of Bt hybrids and a seed-blend to control corn earworm larvae, Urbana, University of Illinois, 2011

Planting date	13 June
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 6.2 • Evaluation of Bt hybrids and a seed-blend to control corn earworm larvae, Urbana, University of Illinois, 2011

Product	Mean no. of CEW[1] larvae per ear[2,3,4]	Mean no. of kernels consumed per ear[3,4,5]
SmartStax (Mycogen 2T784[6])	0.00 b	0.00 c
YieldGard VT2 (DKC63-25[7])	0.18 b	1.68 c
YieldGard VT2 RIB[8] (DKC63-25BJW[9])	0.05 b	1.00 c
UTC[10] (DKC63-45[7])	1.38 a	30.43 a
UTC[10] (Mycogen 2T777[6])	0.90 a	7.90 b

[1] CEW = corn earworm.
[2] Means were derived from the numbers of larvae on 10 ears 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] Data were analyzed using a square root transformation; actual means are shown.
[5] Means were derived from the numbers of kernels consumed on 10 ears 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.
[9] Seed treated with Cruiser (thiamethoxam), 0.25 milligrams (mg) of active ingredient (a.i.) per seed.
[10] UTC = untreated check.