SECTION 5

Evaluation of Bt hybrids and a seed-blend to control black cutworm larvae (*Agrotis ipsilon*) 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 2.5 ft (1 row) x 10 ft. Steel barriers (6 in x 4.5 ft, 5 in tall) were placed around approximately 10 consecutive plants in each plot. Each plant within the barrier was infested with two third-instar black cutworm larvae on 3 June. The number of plants that were fed upon or cut by the larvae was recorded on 6, 10, 17, and 24 June (3, 7, 14, and 21 days after infestation [DAI], respectively).

Planting

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 5.1.

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 percentages of plants cut and plants with feeding injury for dates following infestation with black cutworm larvae are presented in Table 5.2.

Across all sampling dates, the percentage of plants cut was very small and ranged from 0–7%. No significant differences in the percentage of plants cut were observed between any of the treatments on any sampling date.

There was a significant amount of feeding injury for the untreated checks (UTCs) across all sampling dates—the percentage of plants with feeding injury ranged from 62–95%. On all sampling dates, Mycogen 2T777 had a significantly greater amount of feeding injury than DKC63-45. The percentage of plants with feeding injury was significantly smaller for the Bt hybrids and the seed-blend when compared with the UTCs and ranged from 18–37%. No significant differences in the percentage of plants with feeding injury were observed between the Bt hybrids or the seed-blend on any sampling date.

TABLE 5.1 • Agronomic information for efficacy trial of Bt hybrids and a seed-blend to control black cutworm 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 5.2 • Evaluation of Bt hybrids and a seed-blend to control black cutworm larvae, Urbana, University of Illinois, 2011

Product	6 June (3 DAI[1])		10 June (7 DAI[1])		17 June (14 DAI[1])		24 June (21 DAI[1])	
	Mean % of plants cut[2]	Mean % of plants with feeding injury[2]	Mean % of plants cut[2]	Mean % of plants with feeding injury[2]	Mean % of plants cut[2]	Mean % of plants with feeding injury[2]	Mean % of plants cut[2]	Mean % of plants with feeding injury[2]
SmartStax (Mycogen 2T784[3])	0 a	26 c	2 a	26 c	2 a	37 c	2 a	37 c
YieldGard VT2 (DKC63-25[4])	0 a	23 c	2 a	30 c	2 a	32 c	2 a	32 c
YieldGard VT2 RIB[5] (DKC63-25BJW[6])	0 a	18 c	0 a	25 c	0 a	32 c	0 a	32 c
UTC[7] (DKC63-45[4])	0 a	62 b	7 a	69 b	7 a	69 b	7 a	69 b
UTC[7] (Mycogen 2T777[3])	0 a	88 a	4 a	93 a	6 a	95 a	6 a	95 a

[1] DAI = days after infestation (with black cutworm larvae).
[2] Means followed by the same letter do not differ significantly ($P = 0.05$, Duncan's New Multiple Range Test).
[3] Seed treated with Cruiser (thiamethoxam), 0.25 milligrams (mg) of active ingredient (a.i.) per seed.
[4] Seed treated with Poncho (clothianidin), 0.50 milligrams (mg) of active ingredient (a.i.) per seed.
[5] Refuge-in-the-bag (90% Bt seed, 10% non-Bt seed).
[6] Seed treated with Poncho (clothianidin), 0.25 milligrams (mg) of active ingredient (a.i.) per seed.
[7] UTC = untreated check.