2010

Evaluation of Smartstax, VT Triple Pro, and Herculex XTRA

Aaron J. Gassmann
Iowa State University, aaronjg@iastate.edu

Patrick J. Weber
Iowa State University, pjweber@iastate.edu

Evaluation of Smartstax, VT Triple Pro, and Herculex XTRA

Abstract
The purpose of this study was to evaluate Smartstax corn (Dekalb DKC 61-21) compared with VT Triple, VT Triple Pro, Herculex XTRA, and a non-Bt near isoline. Data were collected on injury from corn rootworm and corn earworm.

Keywords
RFR A9072, Entomology

Disciplines
Agricultural Science | Agriculture | Entomology

Evaluation of Smartstax, VT Triple Pro, and Herculex XTRA

RFR-A9072

Aaron Gassmann, assistant professor
Patrick Weber, agricultural specialist
Department of Entomology

Introduction

The purpose of this study was to evaluate Smartstax corn (Dekalb DKC 61-21) compared with VT Triple, VT Triple Pro, Herculex XTRA, and a non-Bt near isoline. Data were collected on injury from corn rootworm and corn earworm.

Materials and Methods

The corn was planted in an area that had been planted the previous year with "trap crop." The seed planted for the trap crop was a mixed maturity blend with a greater proportion of late-maturing varieties. This trap crop constitutes a favorable environment for adult females late in the season when other fields are maturing and results in a high abundance of rootworm larvae the following year. The experimental design for this study was a randomized complete block with four replications. Treatments were eight rows wide, to minimize border effects, and 75 ft in length. This study was planted on May 28 by Ryan Rusk, superintendent, Northwest Research Farm, Sutherland, IA, at a population of 35,600 seeds/acre. In this study we evaluated injury from corn rootworm and corn earworm (CEW). The CEW eggs were hatched overnight and mixed with corn grit at the field site (Sutherland, IA) on August 19, 2009. Prior to infestation, corn ear shoot bags were placed over the ear shoot of all plants in row two of each plot. Bazooka inoculators were used to infest all ears in row two on August 19. Each plant was given two shots of inoculum for a total of 40 CEW larvae/ear.

For the CEW larvae counts, completed on October 1, 2009, 40 ears (10 ears/plot × 4 replications) per treatment were sampled and the number of larvae among three size classes (S = small, M = medium, L = large) was recorded. Counts of total kernels and total damaged kernels were completed on October 19, 2009, with 40 observations (10 ears/plot × 4 replications) per sampled per treatment.

Results and Discussion

No differences were noted among stand counts for any of the treatments (Table 1). For root injury, the non-Bt hybrid (DKC 61-22) with an Aztec 2.1G application overtop had more injury (0.18) than the other treatments, which ranged from 0.00 to 0.02 (Table 2). None of the other hybrids differed statistically for rootworm injury. For corn earworm larval counts, the non-Bt hybrid (DKC 61-22) had the highest number of larvae (74) (Table 3). The Smartstax hybrid and VT Triple Pro had the lowest number of CEW larvae (3 to 8). Herculex XTRA and VT Triple were intermediate and the non-Bt hybrid (DKC 61-22) had the greatest number of larvae (Table 3). For kernel injury, non-Bt hybrid (DKC 61-22) and Herculex XTRA had the most injury and did not differ statistically. SmartStax performed better than VT Triple but had more CEW injury than VT Triple Pro.

Acknowledgements

Thanks to Monsanto for providing the seed and funding for this study and to Ryan Rusk for his valuable assistance. The 2009 Insecticide and Plant-Incorporated Protectants final report will be available on-line at www.ent.iastate.edu under latest news soon.

Table 1. Average stand count for evaluation plant-incorporated protectants. Monsanto Smartstax study.[1]

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Stand counts[5,6]
HXX/RR2	--	--	--	--	35.90
Smartstax	P250	600FS	0.25	ST	35.80
VT Triple Pro	--	--	--	--	35.75
Smartstax	P500	600FS	0.50	ST	35.60
VT Triple	--	--	--	--	34.70
RR hybrid	Aztec	2.1G	0.14	Furrow	34.30

[1]Planted May 28, 2009; evaluated June 23, 2009.
[2]RR hybrid- DKC61-22; VT Triple- DKC61-19; HXX/RR2- NC6214QGV1; VT Triple Pro- NC6214MQK1; and Smartstax (VT3P/HXX)- DKC61-21.
[3]Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed.
[4]Furrow = insecticide applied at planting time, ST = seed treatment.
[5]Means based on 16 observations (4 row trt × 17.5 row-ft/treatment × 4 replications). The values shown are the mean number of plants per 1/1000 acre.
[6]No significant differences between means (ANOVA, $P \leq 0.05$).

Table 2. Average root-injury and product consistency for evaluation of insecticides treatments and plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1].

Hybrid[2]	Treatment	Form.	Rate[3]	Placement[4]	Node-injury[5,6,7]	Product consistency[7,8]
Smartstax	P500	600FS	0.50	ST	0.00a	100a
Smartstax	P250	600FS	0.25	ST	0.00a	100a
VT Triple	--	--	--	--	0.00a	100a
VT Triple Pro	--	--	--	--	0.00ab	100a
HXX/RR2	--	--	--	--	0.02 b	98a
RR hybrid	Aztec	2.1G	0.14	Furrow	0.18 c	83 b

[1]Planted May 28, 2009; evaluated August 3, 2009.
[2]RR hybrid- DKC61-22; VT Triple- DKC61-19; HXX/RR2- NC6214QGV1; VT Triple Pro- NC6214MQK1; and Smartstax (VT3P/HXX)- DKC61-21.
[3]Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed.
[4]Furrow = insecticide applied at planting time, ST = seed treatment.
[5]Chemical and check means based on 40 observations (10 roots/2 rows × 4 replications).
[6]Iowa State Node-Injury Scale (0–3). Number of full or partial nodes completely eaten.
[7]Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$).
[8]Product consistency = percentage of times nodal injury was 0.25 (¼ node eaten) or less.

Table 3. Corn earworm larvae counts for evaluation of insecticides treatments and plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1,2].

Hybrid[3]	Treatment	Form.	Rate[4]	Placement[5]	Larvae size S[6,7,8]	M[6,7,8]	L[6,7,8]	TOTAL[7,8]
Smartstax	P250	600FS	0.25	ST	3a	0a	0a	3a
VT Triple Pro	--	--	--	--	4a	0a	0a	4a
Smartstax	P500	600FS	0.50	ST	8a	0a	0a	8a
VT Triple	--	--	--	--	23ab	11a	2a	36 b
HXX/RR2	--	--	--	--	33 b	21 b	1a	55 b
RR Hybrid	Aztec	2.1G	0.14	Furrow	32 b	26 b	16 b	74 c

[1]Planted May 28, 2009; evaluated September 1, 2009.
[2]All corn ears in row 2 of each plot were infested on August 19, 2009 with 40 CEW larvae per ear using Bazooka inoculators.
[3]RR hybrid- DKC61-22; VT Triple- DKC61-19; HXX/RR2- NC6214QGV1; VT Triple Pro- NC6214MQK1; and Smartstax (VT3P/HXX)- DKC61-21.
[4]Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed.
[5]Furrow = insecticide applied at planting time, ST = seed treatment.
[6]S = small; M = medium; L = large.
[7]Small, medium, large larvae size and total based on 40 observations (10 ears/trt × 4 replications).
[8]Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$).

Table 4. Average total kernels, damaged kernel counts, and percent damaged for evaluation of plant-incorporated protectants. Monsanto Smartstax study: Sutherland, IA, 2009[1,2].

Hybrid[3]	Treatment	Form.	Rate[4]	Placement[5]	Total kernels[6]	Damaged Kernels[6]	% Damaged[6,7]
VT Triple Pro	--	--	--	--	5489	14.00	0.25a
Smartstax	P250	600FS	0.25	ST	6081	39.50	0.64 b
Smartstax	P500	600FS	0.50	ST	5847	38.25	0.66 b
VT Triple	--	--	--	--	5765	70.75	1.21 c
RR Hybrid	Aztec	2.1G	0.14	Furrow	5499	117.75	2.18 d
HXX/RR2	--	--	--	--	5582	144.25	2.61 d

[1]Planted May 28, 2009; evaluated October 19, 2009.
[2]All corn ears in row 2 of each plot were infested on August 19, 2009 with 40 CEW larvae per ear using Bazooka inoculators.
[3]RR hybrid-DKC61-22; VT Triple- DKC61-19; HXX/RR2-NC6214QGV1; VT Triple Pro-NC6214MQK1; and Smartstax (VT3P/HXX)-DKC61-21.
[4]Insecticide listed as ounces a.i. per 1,000 row-ft; seed treatment (ST) listed as mg a.i/seed.
[5]Furrow = insecticide applied at planting time, ST = seed treatment.
[6]Mean total kernels, damaged kernels counts and % damaged based on 40 observations (10 ears/trt × 4 replications).
[7]Means sharing a common letter do not differ significantly according to Ryan's Q Test ($P \leq 0.05$).