2011

Evaluation of Smartstax, Herculex XTRA, and Conventional Corn for Control of Corn Earworm

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Abstract
The purpose of this study was to evaluate Smartstax corn, Herculex XTRA, and a nonBt true isoline for control of corn earworm. Data collected include stand counts, total kernels, and damaged kernels.

Keywords
RFR A1060, Entomology

Disciplines
Agricultural Science | Agriculture | Entomology

Evaluation of Smartstax, Herculex XTRA, and Conventional Corn for Control of Corn Earworm

RFR-A1060

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Introduction

The purpose of this study was to evaluate Smartstax corn, Herculex XTRA, and a non-Bt true isoline for control of corn earworm. Data collected include stand counts, total kernels, and damaged kernels.

Materials and Methods

This study was conducted in a second year cornfield. The experimental design was a randomized complete block with four replications. These treatments were four rows wide, 20 ft in length. This study was planted on May 29 at a population of 35,600 seeds/acre. The treatments consisted of Mycogen conventional corn (X29624), Mycogen Smartstax (2D692), and Mycogen Herculex XTRA (X20625). The corn earworm neonates (CEW) were obtained from the USDA-ARS Corn Insects and Crop Genetics Research Laboratory. These neonates were mixed with corn grit at the field site on July 28, 2010. Prior to infestation, corn ear shoot bags were placed over the top ear shoot of all plants in row 2 and 3 of each plot. Bazooka inoculators were used to infest all ears in row 2 and 3 on July 28. Each plant was given two shots of inoculum for a total of 40 CEW larvae per ear.

Additional Information

The 2010 Insecticide and Plant-Incorporated Protectants field evaluation report will be available on-line at www.ent.iastate.edu under latest news soon.

On August 20, 2010 (23 days after infestation), 10 randomly selected ears were sampled from the two center rows of each plot. From these ears we counted the numbers of kernels damaged and measured with a caliper both length and width of kernel cap size. In addition, we counted the number of rows of kernels around the ear and the number of kernels in an average row length. From these numbers collected, we calculated the percentage of damaged kernels per ear, kernel area consumed (cm^2), and the total number of kernels per ear. The mean kernel area consumed (cm^2) was calculated by multiplying the number of damaged kernels per ear by the centimeter squared of each kernel. Total number of damaged ears was calculated by counting the number of ears that had damaged kernels out of 40 ears.

Results and Discussion

No significant differences were observed for stand counts (Table 1). The Smartstax treatment had significantly fewer damaged kernels than the other two treatments (Table 2). Kernel area consumed and total number of damaged ears, was significantly lower for the Smartstax than Herculex XTRA and conventional hybrid (Table 3).

Acknowledgements

Thanks to Dow AgroSciences for providing the seed and funding for this study, and to Ryan Rusk and his staff for their valuable assistance.

Table 1. Average stand counts for the evaluation of Dow AgroSciences Smartstax vs. Herculex XTRA and conventional corn, Sutherland, IA[1].

Hybrid/Treatment[2]	Stand counts[3]
Conventional	28.75
Smartstax	28.25
HXX/RR2	27.50

[1]Planted April 29, 2010; stand counts evaluated on June 15, 2010.
[2]Conventional-Mycogen X29624; HXT/RR2-Mycogen Herculex XTRA X20625; Smartstax-Mycogen 2D692.
[3]Stand counts based on 16 observations (4 rows/17.5 ft of row × 4 replications). Data shown in 1,000 plants/acre. No statistical difference (P > 0.05).

Table 2. Average total kernels, damaged kernels, and percent damaged for the evaluation of Dow AgroSciences Smartstax vs. Herculex XTRA and conventional corn, Sutherland, IA.[1, 2]

Hybrid/treatment[3]	Total kernels/ear[4]	Damaged kernels/ear[4]	% Damaged kernels/ear[4,5]
Smartstax	673	3.0	0.45a
HXX/RR2	661	10.5	1.59 b
Conventional	662	10.8	1.63 b

[1]Planted April 29, 2010; evaluated August 20, 2010.
[2]All corn ears in row 2 and 3 of each plot were infested on July 28, 2010 with 40 CEW insects per ear using Bazooka inoculators.
[3]Conventional-Mycogen X29624; HXT/RR2-Mycogen Herculex XTRA X20625; Smartstax-Mycogen 2D692.
[4]Mean total kernels, damaged kernels counts and percent damaged based on 10 observations (10 ears/treatment).
[5]Means sharing a common letter do not differ significantly according to Ryan's Q Test (P ≤ 0.05)

Table 3. Average kernel area (sq cm) consumed and number of total damaged ears for the evaluation of Dow AgroSciences Smartstax vs. Herculex XTRA and conventional corn, Sutherland, IA[1, 2].

Hybrid/treatment[3]	Kernel area consumed (sq cm)[4,5]	Total damaged ears[5, 6]
Smartstax	0.63a	12a
HXX/RR2	2.40 b	38 b
Conventional	2.69 b	40 b

[1]Planted April 29, 2010; evaluated August 20, 2010.
[2]All corn ears in row 2 and 3 of each plot were infested on July 28, 2010 with 40 CEW insects per ear using Bazooka inoculators.
[3]Conventional-Mycogen X29624; HXT/RR2-Mycogen Herculex XTRA X20625; Smartstax-Mycogen 2D692.
[4]Kernel area consumed based on 10 observations (10 ears/treatment).
[5]Means in the same column sharing a common letter do not differ significantly according to Ryan's Q Test (P ≤ 0.05).
[6]Total damaged ears based on 40 observations (10 ears/trt × 4 replications).