Corn Genetic Isolines

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Introduction

Corn hybrid genetics change yearly to increase productivity. More and more frequently corn hybrids come as a double or triple stack, and in the near future, quad and 8-stack hybrids will be on the market. There is the question as to whether these traits perform as well as the parent seed and even whether the multiple traits are needed within the same hybrid. This trial will start to look at genetic isoline performance.

Materials and Methods

This study was conducted at Brad Hanson's farm west of Castana, Iowa. In 2006, the field was split between corn and soybean but the entire field was planted to corn in 2007. The soil types are Monona silt loam and Rawles silt loam.

The trial was replicated four times with three trait packages in addition to the parent; YieldGard corn borer, YieldGard rootworm, and YieldGard Plus. All hybrids were of the same parent with Roundup Ready technology. A soil applied insecticide was used on the parent and YieldGard corn borer treatment to compliment the Poncho seed treatment on the YieldGard rootworm and YieldGard Plus treatments. Each plot was eight rows wide by the plot length which was generally 2,300 to 2,400 ft.

The trial had no fall tillage and was field cultivated prior to planting. The nitrogen fertilizer source was 178 and 140 lb N/acre of spring applied anhydrous ammonia for corn following corn and corn following soybean, respectively. A removal rate of phosphorus or potassium was spring applied before field cultivation. There was no pre-plant herbicide application and only a single post-emergence application of Roundup. Grain yields were determined using a yield monitor at harvest.

Results and Discussion

Under the corn-soybean rotation, corn grain yields were not statistically different between the treatments and ranged from 211.7 to 216.7 bushels/acre (Table 1). Additionally, final plant populations were not statistically different, but numerically the corn borer treatment yield was lower than the other treatments.

For the corn-corn rotation, corn grain yields were not statistically different (Table 2). However, the parent treatment yield was numerically lower by 16.3 to 20.1 bushels/acre. Final plant populations were not different, but the corn borer treatment yield was slightly less than the other treatments.

Lodging was a problem at this trial location and percent lodging was determined for each treatment. In the corn-soybean rotation the parent and rootworm treatments had considerably more lodging than the corn borer/rootworm combination. However, in the corn-corn rotation, lodging was not different among the treatments.

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Table 1. Corn grain yield, final plant population and lodging by genetic isoline trial in a corn-soybean rotation at Brad Hanson's field west of Castana, IA.

Genetic package[a]	Grain yield	Final plant population	Lodging
seeds/acre	bushels/acre	plants/acre	%
Parent	216.7	29,375	47.2 a
Bt	211.7	26,625	32.4 bc
RW	211.9	28,625	42.3 ab
BtRW	216.3	28,000	27.3 c
$LSD_{(0.05)}$	ns	ns	14.3

[a]Seed corn hybrid is LG2540RR, LG2540BtRR, LG2540RWRR, and LG2540BtRWRR. Seed brand used does not constitute endorsement of the product.

Table 2. Corn grain yield, final plant population, and lodging by genetic isoline trial in a corn-corn rotation at Brad Hanson's field west of Castana, IA.

Genetic package[a]	Grain yield	Final plant population	Lodging
seeds/acre	bushels/acre	plants/acre	%
Parent	195.3	28,250	26.0
Bt	211.6	26,875	22.3
RW	212.1	27,375	20.1
BtRW	215.4	28,500	19.4
$LSD_{(0.05)}$	ns	ns	ns

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