



2013 DEMONSTRATION REPORT

Monsanto Learning Center at Monmouth, IL

Corn Populations by Stress Mitigation

Background

A corn demonstration study was conducted at the Monsanto Learning Center at Monmouth, Illinois to determine the highest plant population that can be supported before a decrease in potential yield is observed from heat and drought stress associated with a plant population that is too high. The study was designed to show the effects of biotech rootworm protection and how it can help relieve crop stress at different plant populations. Plant population dynamics are important because populations have been increasing over the years due to advancements in corn breeding and better agronomics.

Study Guidelines

- Planted into prior year corn ground.
- Field was conventionally fall tilled with chisel plow.
- Spring seed bed established with soil finisher.
- Seeds planted into 30-inch rows at rates of 28, 32, 36, 40, 44, and 48,000 seeds/acre.
- A 112 RM product with rootworm protection and a 105 RM product without rootworm protection were utilized.
- Nitrogen applied in spring as 32% UAN.

Results

Root systems can be significantly injured by corn rootworm feeding, which can inhibit nutrient and water uptake leading to reductions in potential yield (Figure 1). Biotech protected root systems through increased root mass can help reduce crop stress induced by heat and drought (Figure 2).



Figure 1. Corn Rootworm Injury to Unprotected Root System



Figure 2. Root mass of Corn Rootworm Protected Product.



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Yield increases occurred for both products as population increased; however, there was a substantial drop in yield at the seeding rate of 48,000 seeds/acre for the unprotected product (Table 1 and Figure 3). At all population levels except the 28,000 seeding rate, the product with rootworm protection performed better than the unprotected product (Table 1 and Figure 3).

Summary

- Planting corn at higher seeding rates can result in a larger investment in seed, but selecting the right seed and the right seeding rate can result in potentially higher yields and profits for growers.
- The yield of the rootworm protected product increased because crop stress associated with corn rootworm feeding was reduced compared to the non-protected product.
- The rootworm protected product showed a better response to higher populations under high corn rootworm pressure.
- Traits that protect the plant from corn rootworm damage can help relieve crop stress, which can allow for higher planting populations, higher potential yields, and increased potential profits over products without trait protection.

Legal

The information discussed in this report is from a single site, non-replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Leaf Design® is a registered trademark of Monsanto Company. All other trademarks are the property of their respective owners. ©2013 Monsanto Company. 11242013LGM

Table 1. Corn Yield for Seed Products With and Without Corn Rootworm Protection as Population Increases.

Population seeds/acre	Product Without Corn Rootworm Protection (bu/acre)	Product With Corn Rootworm Protection (bu/acre)
28,000	209.1	209.1
32,000	227.8	234.2
36,000	237.6	251.3
40,000	239.5	256.9
44,000	250.5	261.0
48,000	233.1	263.4

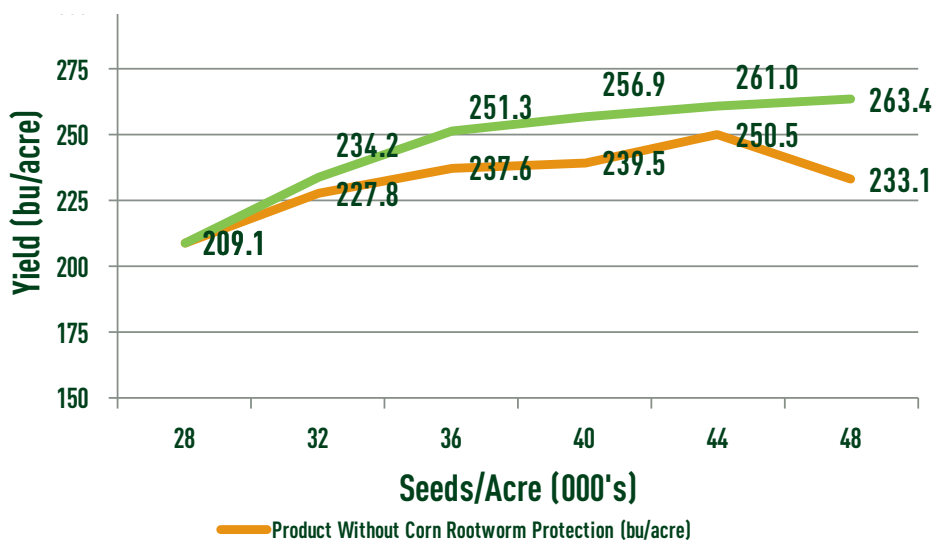


Figure 3. Corn yield for seed products with and without corn rootworm protection as population increases.