2010 Demonstration Report

THE LEARNING CENTER

at Scott, Mississippi

Effects of Plant Population and Row Spacing on Corn Yield

Each year farmers select specific hybrids to be planted in particular fields at certain planting populations, while carefully weighing the potential for increased yield with the potential for stalk lodging or lack of return on the investment for increased seeding rates. In the South, farmers have often had to limit planting populations, to help mitigate potential yield loss, which can be attributed to stalk lodging caused by Southwestern Corn Borer (SWCB) damage and frequent late season storms/hurricanes. Advancements in biotech traits have helped reduce the risk of stalk lodging due to damage from SWCB. Advancements in germplasm have helped reduce plant and ear heights, which can further help reduce the risk of stalk lodging due to conditions which cause stalks to weaken and lodge including the potential for hurricanes. Therefore, higher populations and different row spacing configurations are being evaluated in an attempt to maximize yield potential and the return on investment of seed.

Study Guidelines

Testing was conducted at the Monsanto Learning Center at Scott, Mississippi in 2010 to evaluate the effects and interaction of plant population, row spacing, and germplasm on yield potential. Planting populations were evaluated at 28,000, 33,000, 38,000 and 43,000 kernels/acre. Corn plots were planted using either a 38-inch single-row or twin-row configuration. Twin rows were planted 7.5 inches apart on a 38-inch bed, with a Monosem® Twin-Row planter. Region appropriate fertility and weed control practices were standard throughout all plots, with a final yield goal of 240 bu./acre.

Two hybrids with Genuity® VT Triple PRO™ technology were chosen for this test. Hybrid A is a 116 day hybrid with a shorter plant type and lower ear height. Hybrid B is a 117 day hybrid that is medium to tall, and has moderate to high ear placement.

Table 1. Net Gain ($/acre) for each 5,000 seeds/acre increase in population.

	Hybrid A	Hybrid B
28000	na	na
33000	$93.79	$22.07
38000	$38.61	-$23.74
43000	-$33.90	-$95.24

Corn Price	$5.25
Seed Price	$250.00
Seed/Bag	80000
Price per seed	$0.003125

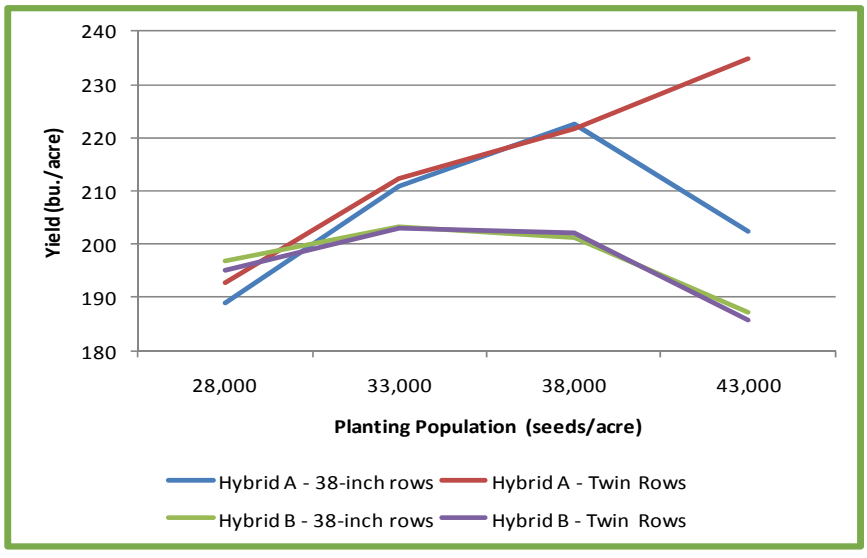

Figure 1. Yield response of two hybrids, in 38-inch rows and twin rows, planted at four different planting populations.

Results

The two hybrids responded differently to row configuration and population in terms of yield and return on investment (ROI) (Figure 1 and Table 1). Hybrid A showed optimal yield potential at 38,000 or 43,000 seeds/acre depending on the row spacing configuration. The best ROI for Hybrid A was with 38,000 seeds/acre when averaged across row spacing configurations. The highest yield and ROI for Hybrid B was achieved at 33,000 seeds/acre regardless of row spacing configuration.

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Conclusions

- Germplasm can significantly affect the optimum plant population in terms of yield potential and ROI.
- Hybrids with shorter plant heights and lower ear placement are more likely to withstand the wind damage from hurricanes that can cause stalk lodging. This adaptation allows for higher plant populations, near 38,000 seeds/acre, and thereby higher yield potential.
- Traits that protect against SWCB help reduce the risk of stalk lodging due to SWCB damage and associated stalk weathering, thereby making the concept of planting at higher populations to attain higher yield potentials more feasible.
- The interactions between germplasm, row spacing, and populations will continue to need to be evaluated as advancements in breeding and technology occur.

Southwestern Corn Borer

Twin Row Corn

The information discussed in this report is from a single site, non-replicated, one-year 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.

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