

2011 LEARNING CENTER

at Scott, Mississippi
DEMONSTRATION REPORT



IMPACT OF MULTIPLE STRESS FACTORS ON CORN YIELD POTENTIAL

Corn plants face multiple stresses throughout the growing season which can reduce yield potential. Some stresses may be avoided by proper planning, proper equipment adjustment, and timing of inputs.

STUDY GUIDELINES

A demonstration trial was conducted in 2011 at the Monsanto Learning Center near Scott, Mississippi to evaluate the impact of multiple stress factors on corn yield potential in the South. The factors evaluated are shown in Table 1.

Two corn products (DKC66-96 Brand and DKC67-88 Brand) with different base genetics and relative maturities (RM) of 116 and 117 days were planted on April 13th and harvested on August 20th. Each treatment was replicated twice.

Yield comparisons for each factor with and without stress are shown in Table 2. In addition, yield comparisons based on increases in the number of stress factors per plot are shown in Figure 1.

RESULTS AND CONCLUSIONS

Each stress factor caused decreases in yield when compared to normal management. Low planting population and late fertility had similar effects on yield potential. The normal planting population out yielded the low planting population by 9.6 bu/acre and the normal fertility program out yielded the late fertility by 8.7 bu/acre. Late irrigation had a somewhat reduced impact but also lowered yield potential with a 3.4 bu/acre yield difference between normal and late irrigation. Improper stagger, or seed spacing, had the least influence of all but still impacted yield with a 1.9 bu/acre yield difference between normal and improper stagger. Finally, as the number of stress factors increased the decrease in yield became larger (Figure 1). The plots with no stress had an average yield of 170.3 bu/acre. The addition of each stress caused incremental decreases in yield ranging from 2.2 bu/acre to 5.3

Table 1. Normal and stress factors evaluated in the trial: plant population, fertility, irrigation, and seed placement stagger.

Factor	Management	Yield (bu/acre)
Plant Population	Normal	36,500 seeds/acre
	Low	32,000 seeds/acre
Nitrogen (N) Fertility	Normal	on time with 2 splits of 120 units each
	Late	delayed 10 days past normal with 2 splits of 120 units each
Irrigation	Normal	as needed
	Late	10 days late
Stagger	Normal	properly adjusted
	Improper	side-by-side planting

Table 2. Yield (bu/acre) for each factor with and without stress.

Factor	Management	Yield (bu/acre)
Plant Population	Normal	168.2
	Low	158.6
N Fertility	Normal	168.0
	Late	159.3
Irrigation	Normal	165.2
	Late	161.8
Stagger	Normal	164.5
	Improper	162.6

to pg. 2 ►



IMPACT OF MULTIPLE STRESS FACTORS ON CORN YIELD POTENTIAL

▶ from previous page

bu/acre. Plots that had four stress factors had the lowest average yield of 155.8 bu/acre.

This study reinforces several crop management processes that are essential to reach optimum yield potential. First, it is critical to make good, up-front decisions regarding corn product selection and plant population while setting a realistic yield goal. Second, equipment adjustments, such as stagger settings, planting depth and consistency, and disk openers are essential to establish the

correct plant population. Third, small alterations in timing, such as late irrigation and fertility applications, can have a negative impact on yield potential. If these factors are inadequate to provide what is needed for optimal plant growth they can also contribute to yield loss. This demonstration supports the idea that the more stresses that are present, the lower the yield potential.

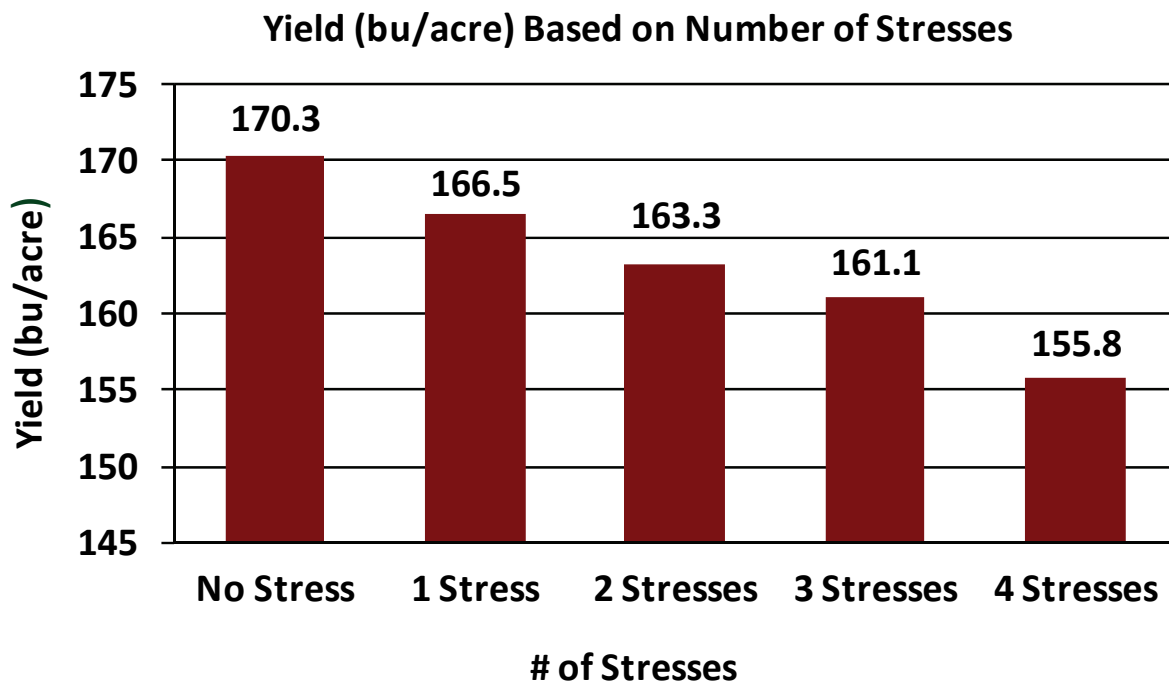


Figure 1. Yield (bu/acre) based on number of stress factors.

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. Technology Development by Monsanto and Design® and DEKALB and Design® are registered trademarks of Monsanto Technology LLC. ©2011 Monsanto Company.AMB10412