Mississippi Corn for Grain Hybrid Trials, 2018

PROCEDURES

Trials were conducted on Experiment Station land or on grower-cooperator fields in two geographical areas in Mississippi: Area I, located in the hill region of Mississippi (one irrigated and four dryland locations); and Area II, located in the Delta region of Mississippi (three irrigated locations) (see map). Commercial seed companies were given the opportunity to enter hybrids in either Area I or Area II or both.

Plots consisted of two 30-inch rows, 15 feet long. Weeds were controlled by cultivation and/or herbicides. Only herbicides currently registered for use on corn were used in these studies, with strict adherence to all label instructions.

All hybrids were treated with Poncho or Cruiser for seedling insect control. Experimental design was a randomized complete block with four replications at each location.

Seed of all entries were supplied by participating companies. All seed were packaged for planting at seeding rates suggested by the participating company and planted with a precision vacuum planter. Fertilizer was applied according to soil test recommendations. Plots in Area I were grown under both dryland and irrigated conditions, and plots in Area II were grown under irrigated conditions. All irrigated trials were either furrow or center-pivot irrigated, as necessary.

VARIABLES MEASURED IN THE CORN HYBRID TESTS

Yield: An Almaco SPC 40 plot combine was used to harvest the total area of each plot. Harvested grain was weighed, moisture was determined, and yields were converted to bushels per acre at 14% moisture.

Ear Height: Ear height is the distance from the soil to the highest ear-bearing node.

Harvest Population: Harvest population is a measure of the number of plants per acre, based on actual stand counts.

USE OF DATA TABLES AND SUMMARY STATISTICS

The yield potential of a given hybrid cannot be measured with complete accuracy. Consequently, replicate plots of all hybrids are evaluated for yield, and the yield of a given hybrid is estimated as the mean of all replicate plots of that hybrid. Yields vary somewhat from one replicate plot to another, which introduces a certain degree of error to the value. As a result, although the mean yields of some hybrids are numerically different, the two hybrids may not be significantly different from each other within the range of natural variation. That is, the ability to measure yield is not precise enough to determine what the small differences are, other than what might be observed purely by chance.

The least significant difference (LSD) is an estimate of the smallest difference between two hybrids that can be declared to be the result of something other than random variation in a particular trial. Consider the following example for a given trial:

Hybrid	Yield
A	90 bu/A
B	85 bu/A
C	81 bu/A
LSD	7 bu/A

The difference between hybrid A and hybrid B is 5 bu/A (i.e., 90 - 85 = 5). This difference is smaller than the LSD (7 bu/A). Consequently, we would conclude that hybrid A and hybrid B have the same yield potential, since we are unable to say that the observed difference did not occur purely due to chance. However, the differ-

ence between hybrid A and hybrid C is 9 bu/A (i.e., 90 - 81 = 9), which is larger than the LSD (7 bu/A). We would therefore conclude that the yield potential of hybrid A is superior to that of hybrid C.

The coefficient of variation (CV) is a measure of the relative precision of a given trial and is used to compare the relative precision of different trials. The CV is generally considered an estimate of the amount of unexplained variation in a given trial. This unexplained variation can be the result of variation between plots with respect to soil type, fertility, insects, diseases, moisture stress, etc. Overall, as the CV increases, the precision of a given trial decreases.

The coefficient of determination (R^2) is another measure of the level of precision in a trial and is also used to compare the relative precision of different trials. The R^2 is a measure of the amount of variation that is explained, or accounted for, in a given trial. For example, an R^2 value of 90 percent indicates that 90 percent of the observed variation in the trial has been accounted for in the trial, with the remaining 10 percent being unaccounted for. The higher the R^2 value, the more precise the trial. The R^2 is generally considered a better measure of precision than the CV for comparison of different trials.

Table 1. 2018 corn hybrid trials location summary.

Location	Irrigation	Soil type	Planting date	Harvest date	Row spacing
Aberdeen, Chris Ausborn Farm	Not Irrigated	Houston clay	3/26	8/31	30”
Brooksville, Black Belt Branch	Not Irrigated	Brooksville silty clay	3/26	8/15	30”
Macon, Dorsey Unruh Farm	Irrigated	Vaiden silty clay	4/6	8/28	30”
Olive Branch, Todd Williams Farm	Not Irrigated	Collins silt loam	5/3	10/9	30”
Stoneville (clay), Delta Branch	Irrigated	Sharkey clay	3/22	8/30	30”
Stoneville (loam), Delta Branch	Irrigated	Bosket very fine sandy loam	3/22	8/30	30”
Rolling Fork (1), Todd Heigle Farm	Irrigated	Commerce silty clay loam	4/12	8/23	30”
Rolling Fork (2), Todd Heigle Farm	Not Irrigated	Commerce silty clay loam	4/12	8/23	30”
Raymond, Brown Loam Branch	Not Irrigated	Loring silt loam	3/23	8/14	30”
Minter City, Ricky Belk Farm[1]	Irrigated	—	—	—	30”

[1]Excessive rainfall during spring delayed planting beyond planting window for this location.