Mississippi Grain Sorghum Hybrid Trials, 2017

PROCEDURES

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

Plots consisted of various row patterns, depending on the location. Plot sizes were one of the following: (1) two 30-inch-wide, 16-foot-long rows; (2) two 40-inch-wide, 19-foot-long rows; or (3) three 19-inch-wide, 18-foot-long rows. These planting patterns were used to accommodate the producer at each location.

Weeds were controlled by cultivation and/or herbicides. Only herbicides currently registered for use on grain sorghum were used in these studies, with strict adherence to all label instructions.

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 cone planter. Fertilizer was applied according to soil test recommendations.

Grain Sorghum Performance Measurements

Yield: An Almaco 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.

Head Exertion: This measurement is the average distance in inches from the flag leaf to the base of the panicle.

Grain Moisture: This measurement is expressed as a percent moisture of grain at harvest.

Plant Height: This measurement is the average height in inches from the soil surface to the top of the grain head.

Head Compactness: This variable was measured on a 1–5 scale: 1 = head short and oval; 2 = head long and slender; 3 = head elongated and oval; 4 = head elongated and rectangular; and 5 = head elongated and open.

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 difference 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. Hybrids entered in the Mississippi Grain Sorghum Hybrid Trials, 2017.

Company	Brand	Hybrid	Nonirrigated planting rate (x1000)	Irrigated planting rate (x1000)
Chromatin Inc.	Chromatin Inc.	CHR2042	60	100
Chromatin Inc.	Chromatin Inc.	CHR0029	60	100
Monsanto	DeKalb	DKS54-00	90	110
Monsanto	DeKalb	DKS53-67	90	110
Monsanto	DeKalb	DKS53-53	90	110
Monsanto	DeKalb	DKS51-01	90	110
Crop Production Services	Dyna-Gro	M60GB31	75	95
Crop Production Services	Dyna-Gro	GX16855	75	95
Crop Production Services	Dyna-Gro	GX16833	75	95
Crop Production Services	Dyna-Gro	GX15371	75	95
Crop Production Services	Dyna-Gro	GX17818	75	95
Crop Production Services	Dyna-Gro	M73GR55	75	95
Crop Production Services	Dyna-Gro	M74GB17	75	95
DuPont Pioneer	Pioneer	84P80	80	80
DuPont Pioneer	Pioneer	83P99	80	80
DuPont Pioneer	Pioneer	83P17	80	80
Chromatin Inc.	Sorghum Partners	SP7715	60	100
Chromatin Inc.	Sorghum Partners	NK6638	60	100
Chromatin Inc.	Sorghum Partners	SP 78M30	60	100
Terral Seed	Terral	REV 9924	85	95
Terral Seed	Terral	REV 9782	85	95
Terral Seed	Terral	REV 9562	85	95