MISSISSIPPI GRAIN SORGHUM

HYBRID TRIALS, 2023

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

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MS AGRICULTURAL AND
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NOTE TO USER

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This report contains data generated as part of the Mississippi Agricultural and Forestry Experiment Station research program. Trade names of commercial products used in this report are included only for clarity and understanding.

Mississippi Grain Sorghum Hybrid Trials, 2023

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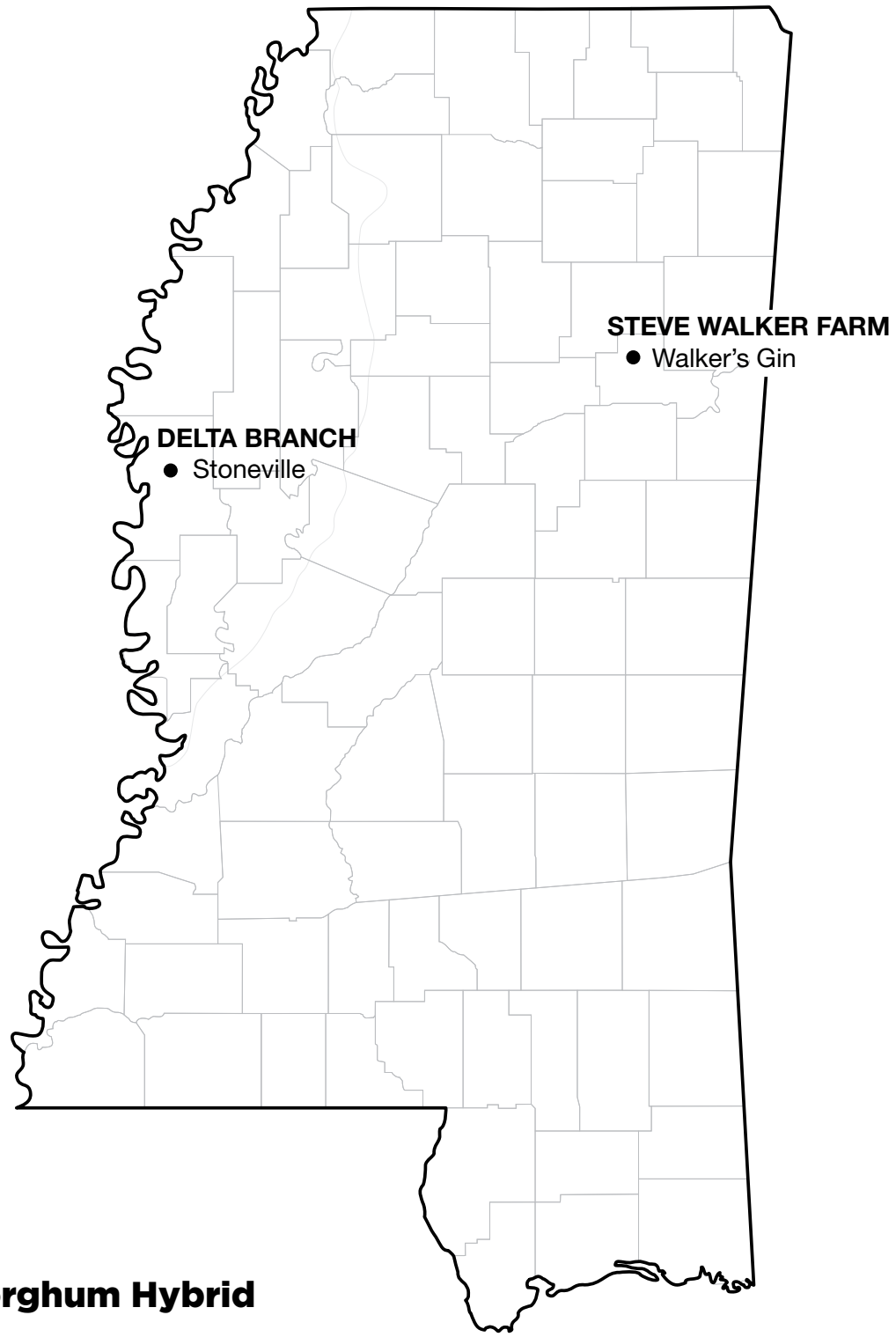
Find variety trial information online at ***mafes.msstate.edu/variety-trials.***



Grain Sorghum Hybrid

TEST LOCATIONS

Mississippi Grain Sorghum Hybrid Trials, 2023

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 40-inch-wide, 16-foot-long rows; or (2) three 19-inch-wide, 16-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. 2023 MSU OVT Grain Sorghum Locations and Dates

Location	Soil Type	Planting Date	Harvest Date	soil pH	soil fertility	fertilizer, herbicide & insecticide applications
Stoneville	Basket very fine sandy loam	5/18/23	9/11/23	6.5	P-M, K-M	Preemerge - Atrazine @ 48 oz/A, Dual Magnum @ 24 oz/A on May 18. Postemergence- Atrazine @ 48 oz/A, Dual Magnum @ 22 oz/A on June 1. Sidedress- N @ 120 lbs/A (32% UAN) on May 30. Insecticide(s)- Alias @ 2 oz/A on June 21; Vantacor @ 1.2 oz/A, Karate @ 1.5 oz/A on July 8; Warrior II @ 1.5 oz/A on July 10; Transform @ 1.5 oz/A on July 19.
Walker's Gin	Mathiston silt loam	5/26/23	9/26/23	5.8	P-M, K-M	Preemerge - Lexar @ 2 qt/A, Gramoxone @ 1 qt/A on May 26. Topdress-N @ 25 lbs/A (33-0-0-12S) on June 23; N @ 115 lbs/A (46-0-0) on July 15.

Table 2. Hybrids entered in the Mississippi grain sorghum hybrid trials, 2023.				
Brand	Hybrid[1]	Seed Treatment	Plant population (x1000)	Days to maturity
Dekalb	DKS45–60	Concep/Poncho	90K	113
Dekalb	DKC50–07	Concep/Poncho	90K	114
Dekalb	DKC51–01	Concep/Poncho	90K	116
Dekalb	DKS54–07	Concep/Poncho	90K	118
Dyna-Gro	M63GB78	Safened+PROF IMID	90K	63
Dyna-Gro	M67GB87	Safened+PROF IMID	90K	67
Dyna-Gro	M71GR91	Safened+PROF IMID	90K	71
Dyna-Gro	M72GB71	Safened+PROF IMID	90K	72
Dyna-Gro	GX22932 *	Safened+PROF IMID	90K	68
Dyna-Gro	GX22934 *	Safened+PROF IMID	90K	70
Dyna-Gro	GX22936 *	Safened+PROF IMID	90K	65
Dyna-Gro	GX22937 *	Safened+PROF IMID	90K	69
Pioneer	84P68	Cruiser/Concept	90K	117
Pioneer	84P80	Cruiser/Concept	90K	120–124
[1]Hybrid followed by an asterisk indicates an experimental entry.				

Table 3. 2023 yield summary of grain sorghum hybrid trials in Mississippi.				
Brand	Hybrid[1]	Stoneville Delta (loam)	Walker's Gin Hills (loam)	Overall avg.
		bu/A	*bu/A*	*bu/A*
Dekalb	DKS45–60	130.2	69.0	99.6
Dekalb	DKC50–07	136.0	108.2	122.1
Dekalb	DKC51–01	132.3	76.6	104.4
Dekalb	DKS54–07	127.0	109.2	118.1
Dyna-Gro	M63GB78	117.6	95.5	106.6
Dyna-Gro	M67GB87	139.0	100.3	119.6
Dyna-Gro	M71GR91	125.9	112.4	119.1
Dyna-Gro	M72GB71	108.4	87.8	98.1
Dyna-Gro	GX22932 *	122.8	115.3	119.1
Dyna-Gro	GX22934 *	133.5	113.2	123.3
Dyna-Gro	GX22936 *	129.8	74.7	102.2
Dyna-Gro	GX22937 *	138.2	108.8	123.5
Pioneer	84P68	127.2	101.7	114.5
Pioneer	84P80	136.6	102.1	119.3
Mean		128.9	98.2	113.5
CV		6.5	14.0	
R^2		59.0	63.0	
LSD(0.05)		12.0	19.8	
Errordf		39	39	
[1]Hybrid followed by an asterisk indicates an experimental entry.				

Table 4. Two-year summary of grain sorghum hybrid trials in Mississippi.				
Brand	Hybrid[1]	Stoneville Delta (loam)	Walker's Gin Hills (loam)	Overall avg.
		bu/A	*bu/A*	*bu/A*
Dekalb	DKS45–60	119.0	76.0	97.5
Dekalb	DKC50–07	122.6	98.4	110.5
Dekalb	DKC51–01	121.4	76.1	98.8
Dekalb	DKS54–07	120.2	102.2	111.2
Dyna-Gro	M63GB78	104.2	63.2	83.7
Dyna-Gro	M67GB87	124.8	88.0	106.4
Dyna-Gro	M71GR91	116.4	92.9	104.6
Dyna-Gro	M72GB71	111.2	87.8	99.5
Dyna-Gro	GX22932 *	111.7	99.8	105.7
Overall Mean		116.9	87.1	102.0
[1]Hybrid followed by an asterisk indicates an experimental entry.				

Table 5. Three-year average of grain sorghum hybrid trials in Mississippi.				
Brand	Hybrid[1]	Stoneville Delta (loam)	Walker's Gin Hills (loam)	Overall avg.
		bu/A	*bu/A*	*bu/A*
Dekalb	DKS45-60	122.8	81.2	102.0
Dekalb	DKC50-07	128.9	97.3	113.1
Dekalb	DKC51-01	125.0	80.6	102.8
Dekalb	DKS54-07	117.7	98.3	108.0
Dyna-Gro	M71GR91	117.5	93.6	105.5
Dyna-Gro	M72GB71	110.4	88.6	99.5
Overall Mean		120.4	89.9	105.2
[1]Hybrid followed by an asterisk indicates an experimental entry.				

Table 6. 2023 grain sorghum plant heights, head exertion, and head compactness.							
Brand	Hybrid	Stoneville Delta (loam)			Walker's Gin Hills (loam)		
		Plant Height	Head exertion	Head compact-ness	Plant Height	Head exertion	Head compact-ness
		in	*in*	*(1-5)*	*in*	*in*	*(1-5)*
Dekalb	DKS45-60	58	9	1	47	11	2
Dekalb	DKC50-07	59	7	2	51	9	1
Dekalb	DKC51-01	62	6	1	48	3	1
Dekalb	DKS54-07	60	5	1	54	9	1
Dyna-Gro	M63GB78	52	7	5	52	7	1
Dyna-Gro	M67GB87	61	3	2	51	7	1
Dyna-Gro	M71GR91	60	8	1	56	9	1
Dyna-Gro	M72GB71	55	2	3	49	3	1
Dyna-Gro	GX22932	66	4	2	56	3	1
Dyna-Gro	GX22934	61	8	2	57	8	1
Dyna-Gro	GX22936	47	4	5	42	3	2
Dyna-Gro	GX22937	60	4	3	50	9	1
Pioneer	84P68	64	7	5	52	5	3
Pioneer	84P80	59	5	4	49	9	2

Table 7. Performance results of 14 hybrids grown at MAFES Delta Branch, Stoneville, 2023.

Brand	Hybrid[1]	2023 yield	2-year average	3-year average	Plant height	Head exertion	Head compactness
		bu/A	*bu/A*	*bu/A*	*in*	*in*	*(1-5)*
Dyna-Gro	M67GB87	139.0	124.8	—	61	3	2
Dyna-Gro	GX22937 *	138.2	—	—	60	4	3
Pioneer	84P80	136.6	—	—	59	5	4
Dekalb	DKC50-07	136.0	122.6	128.9	59	7	2
Dyna-Gro	GX22934 *	133.5	—	—	61	8	2
Dekalb	DKC51-01	132.3	121.4	125.0	62	6	1
Dekalb	DKS45-60	130.2	119.0	122.8	58	9	1
Dyna-Gro	GX22936 *	129.8	—	—	47	4	5
Pioneer	84P68	127.2	—	—	64	7	5
Dekalb	DKS54-07	127.0	120.2	117.7	60	5	1
Dyna-Gro	M71GR91	125.9	116.4	117.5	60	8	1
Dyna-Gro	GX22932 *	122.8	111.7	—	66	4	2
Dyna-Gro	M63GB78	117.6	104.2	—	52	7	5
Dyna-Gro	M72GB71	108.4	111.2	110.4	55	2	3
Mean		128.9					
CV		6.5					
R^2		59.0					
LSD(0.05)		12.0					
Errordf		39					

[1]Hybrid followed by an asterisk indicates an experimental entry.

Rainfall Summary (Inches)

May	0.00	August	2.86
June	2.38	September	0.48
July	3.85	Total	9.57

STEVE WALKER FARM, WALKER'S GIN

Table 8. Performance results of 14 hybrids grown at Steve Walker Farm, Walker's Gin, 2023.

Brand	Hybrid[1]	2023 yield	2-year average	3-year average	Plant height	Head exertion	Head compactness
		bu/A	**bu/A**	**bu/A**	**in**	**in**	**(1-5)**
Dyna-Gro	GX22932 *	115.3	99.8	—	56	3	1
Dyna-Gro	GX22934 *	113.2	—	—	57	8	1
Dyna-Gro	M71GR91	112.4	92.9	93.6	56	9	1
Dekalb	DKS54-07	109.2	102.2	98.3	54	9	1
Dyna-Gro	GX22937 *	108.8	—	—	50	9	1
Dekalb	DKC50-07	108.2	98.4	97.3	51	9	1
Pioneer	84P80	102.1	—	—	49	9	2
Pioneer	84P68	101.7	—	—	52	5	3
Dyna-Gro	M67GB87	100.3	88.0	—	51	7	1
Dyna-Gro	M63GB78	95.5	63.2	—	52	7	1
Dyna-Gro	M72GB71	87.8	87.8	88.6	49	3	1
Dekalb	DKC51-01	76.6	76.1	80.6	48	3	1
Dyna-Gro	GX22936 *	74.7	—	—	42	3	2
Dekalb	DKS45-60	69.0	76.0	81.2	47	11	2
Mean		98.2					
CV		14.0					
R^2		63.0					
LSD(0.05)		19.8					
Errordf		39					

[1]Hybrid followed by an asterisk indicates an experimental entry.

Rainfall Summary (Inches)

May	0.00	August	2.93
June	3.13	September	1.55
July	4.88	Total	12.49

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Scott Willard, Director mafes.msstate.edu