MISSISSIPPI GRAIN SORGHUM

HYBRID TRIALS, 2024

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

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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 Variety Trials, 2024

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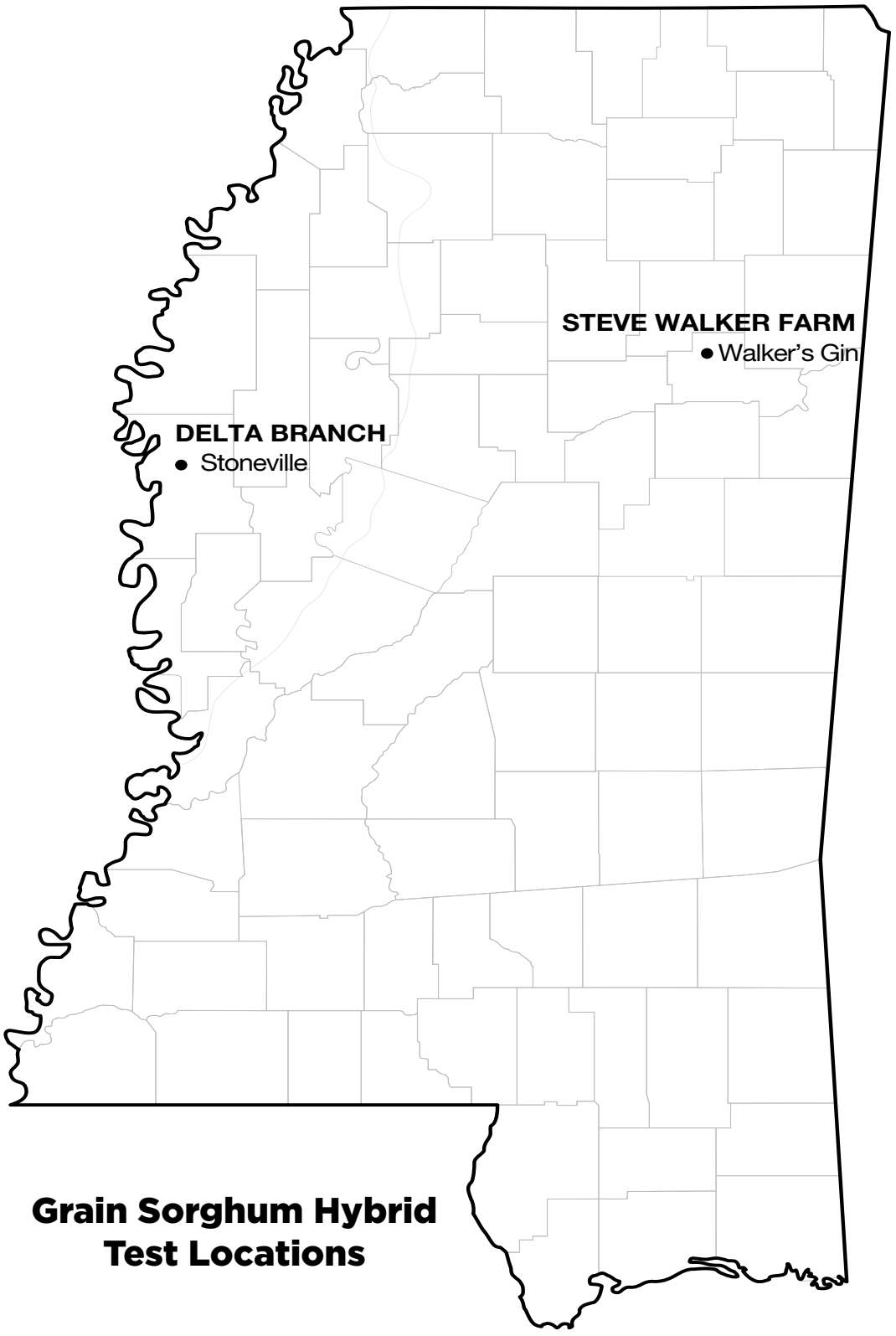
Find variety trial information online at ***mafes.msstate.edu/variety-trials.***



Grain Sorghum Hybrid Test Locations

Mississippi Grain Sorghum Variety Trials, 2024

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 (7bu/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.

RESULTS

Table 1. 2024 MSU OVT Gain Sorghum Locations and Dates.						
Location	**Soil Type**	**Planting Date**	**Harvest Date**	**Soil pH**	**Soil Fertility**	**Fertilizer, Herbicide & Insecticide Applications**
Stoneville	Bosket very fine sandy loam	5/16/24	9/10/24	6.5	P-M, K-M	Preemerge- Atrazine @ 32 oz/A, Dual Magnum @ 21 oz/A on May 16. Postemergence- Atrazine @ 48 oz/A, Dual Magnum @ 21 oz/A on June 1. Sidedress- N @ 120 lbs/A (32% UAN) on May 29. Insecticide(s)- Alias @ 2 oz/A on June 21; Vantacor @ 1.2 oz/A, Prevathon @ 14oz/A and Warrior II @ 2 oz/A on July 10 .
Walker's Gin	Mathiston silt loam	5/21/24	10/9/24	5.8	P-M, K-M	Preemerge- Lexar @ 2 qt/A, Gramoxone @ 1 qt/A on May 21. Postemergence- Atrazine @ 1 qt/A and Huskie @ 11 oz/A. Topdress- 0-23-30 @ 200 lbs/A & 46-0-0 @ 250 lbs/A on June 12.

Table 2. Hybrids entered in Mississippi grain sorghum hybrid trials, 2024.				
Brand	**Hybrid[1]**	**Seed Treatment**	**Plant Population (x1000)**	**Days to Maturity**
BH Genetics	BH 4041	Concept, Apron, Poncho	90K	65
BH Genetics	BH 4220	Concept, Apron, Poncho	90K	64
BH Genetics	BH 5755	Concept, Apron, Poncho	90K	71
DeKalb	DKC45-60	Fungicide+Insecticide	90K	113
DeKalb	DKC50-07	Fungicide+Insecticide	90K	114
DeKalb	DKC51-01	Fungicide+Insecticide	90K	116
DeKalb	DKC54-07	Fungicide+Insecticide	90K	118
Dyna-Gro Seed	GX24991*	Safened + Prof IMID	90K	60
Dyna-Gro Seed	M62GB36	Safened + Prof IMID	90K	62
Dyna-Gro Seed	M63GB78	Safened + Prof IMID	90K	63
Dyna-Gro Seed	M66GR32	Safened + Prof IMID	90K	66
Dyna-Gro Seed	M67GB87	Safened + Prof IMID	90K	67
Dyna-Gro Seed	M70GR37	Safened + Prof IMID	90K	70
Dyna-Gro Seed	M71GB91	Safened + Prof IMID	90K	71
Dyna-Gro Seed	M72GB71	Safened + Prof IMID	90K	72

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

Table 3. 2024 Yield summary of grain sorghum hybrid trials in Mississippi.				
Brand	**Hybrid[1]**	**Stoneville (loam)**	**Walker's Gin (loam)**	**Overall Average**
		bu/A	**bu/A**	**bu/A**
BH Genetics	BH 4041	130.3	95.7	113.0
BH Genetics	BH 4220	122.0	96.4	109.2
BH Genetics	BH 5755	115.2	115.6	115.4
DeKalb	DKC45-60	134.2	113.2	123.7
DeKalb	DKC50-07	118.7	110.4	114.5
DeKalb	DKC51-01	122.0	101.9	112.0
DeKalb	DKC54-07	144.9	132.2	138.6
Dyna-Gro	GX24991 *	51.8	18.9	35.4
Dyna-Gro	M62GB36	104.9	91.7	98.3
Dyna-Gro	M63GB78	87.7	89.0	88.4
Dyna-Gro	M66GR32	115.8	92.9	104.3
Dyna-Gro	M67GB87	133.7	111.3	122.5
Dyna-Gro	M70GR37	136.0	121.9	129.0
Dyna-Gro	M71GB91	122.2	114.4	118.3
Dyna-Gro	M72GB71	128.1	127.8	127.9
MEAN		117.8	102.2	110.0
CV		16.0	10.0	
R^2		64.0	88.0	
LSD (0.05)		26.9	15.4	
Error DF		45	45	

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

Table 4. Two-year summary of grain sorghum hybrid trials in Mississippi.				
Brand	**Hybrid**	**Stoneville Delta**	**Walker's Gin Hills**	**Overall Average**
		bu/A	**bu/A**	**bu/A**
DeKalb	DKC45-60	132.2	91.1	111.7
DeKalb	DKC50-07	127.3	109.3	118.3
DeKalb	DKC51-01	127.2	89.2	108.2
DeKalb	DKC54-07	136.0	120.7	128.3
Dyna-Gro	M62GB36	117.3	83.2	100.3
Dyna-Gro	M63GB78	102.7	92.3	97.5
Dyna-Gro	M66GR32	119.3	104.1	111.7
Dyna-Gro	M67GB87	136.3	105.8	121.1
Dyna-Gro	M70GR37	137.1	115.4	126.2
Dyna-Gro	M71GB91	124.1	113.4	118.7
Dyna-Gro	M72GB71	118.3	107.8	113.0
OVERALL MEAN		125.2	102.9	114.1

Table 5. Three-year average of grain sorghum hybrid trials in Mississippi.				
Brand	**Hybrid**	**Stoneville Delta (loam)**	**Walker's Gin Hills (loam)**	**Overall Average**
		bu/A	**bu/A**	**bu/A**
DeKalb	DKC45-60	124.1	88.4	106.3
DeKalb	DKC50-07	121.3	102.4	111.8
DeKalb	DKC51-01	121.6	84.7	103.2
DeKalb	DKC54-07	128.5	112.2	120.3
Dyna-Gro	M63GB78	98.7	71.8	85.3
Dyna-Gro	M66GR32 (GX22932)	113.1	97.5	105.3
Dyna-Gro	M67GB87	127.8	95.8	111.8
Dyna-Gro	M71GB91	118.3	100.0	109.2
Dyna-Gro	M72GB71	116.9	101.2	109.0
OVERALL MEAN		118.9	94.9	106.9

Table 6. 2024 grain sorghum plant heights, head exertion, and head compactness.							
Brand	Hybrid[1]	Stoneville			Walker's Gin		
		Plant Height	Head Exertion	Head Compactness	Plant Height	Head Exertion	Head Compactness
		in	in	(1-5)	in	in	(1-5)
BH Genetics	BH 4041	40	7	1	49	5	1
BH Genetics	BH 4220	46	3	3	53	6	3
BH Genetics	BH 5755	48	3	2	63	8	1
DeKalb	DKC45-60	50	5	1	57	9	3
DeKalb	DKC50-07	50	4	1	62	3	1
DeKalb	DKC51-01	51	11	3	58	6	1
DeKalb	DKC54-07	50	3	1	66	7	1
Dyna-Gro	GX24991 *	40	5	1	43	7	2
Dyna-Gro	M62GB36	46	3	4	51	6	4
Dyna-Gro	M63GB78	54	9	3	56	8	4
Dyna-Gro	M66GR32	55	7	1	57	7	1
Dyna-Gro	M67GB87	55	4	2	56	6	1
Dyna-Gro	M70GR37	49	3	1	54	13	2
Dyna-Gro	M71GB91	53	4	1	62	8	1
Dyna-Gro	M72GB71	43	3	1	59	3	3
[1]Hybrid followed by an asterisk indicates an experimental entry.							

MAFES DELTA BRANCH, STONEVILLE

Table 7. Performance results of 15 hybrids grown at MAFES Delta Branch, Stoneville, 2024.							
Brand	**Hybrid[1]**	**2024 Yield**	**2-year Average**	**3-year Average**	**Plant Height**	**Head Exertion**	**Head Compactness**
		bu/A	**bu/A**	**bu/A**	**in**	**in**	**(1-5)**
DeKalb	DKC54-07	144.9	136.0	128.5	50	3	1
Dyna-Gro	M70GR37 (GX22937)	136.0	137.1	-	49	3	1
DeKalb	DKC45-60	134.2	132.2	124.1	50	5	1
Dyna-Gro	M67GB87	133.7	136.3	127.8	55	4	2
BH Genetics	BH 4041	130.3	-	-	40	7	1
Dyna-Gro	M72GB71	128.1	118.3	116.9	43	3	1
Dyna-Gro	M71GB91	122.2	124.1	118.3	53	4	1
DeKalb	DKC51-01	122.0	127.2	121.6	51	11	3
BH Genetics	BH 4220	122.0	-	-	46	3	3
DeKalb	DKC50-07	118.7	127.3	121.3	50	4	1
Dyna-Gro	M66GR32 (GX22932)	115.8	119.3	113.1	55	7	1
BH Genetics	BH 5755	115.2	-	-	48	3	2
Dyna-Gro	M62GB36 (GX22936)	104.9	117.3	-	46	3	4
Dyna-Gro	M63GB78	87.7	102.7	98.7	54	9	3
Dyna-Gro	GX24991 *	51.8	-	-	40	5	1
MEAN		117.8					
CV		16.0					
R^2		64.0					
LSD (0.05)		26.9					
Error DF		45					

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

STEVE WALKER'S FARM, WALKER'S GIN

Table 8. Performance results of 15 hybrids grown at Steve Walker Farm, Walker's Gin, 2024.								
Brand	**Hybrid[1]**	**2024 Yield**	**2-year Average**	**3-year Average**	**Plant Height**	**Head Exertion**	**Head Compactness**	**Lodging Score**
		bu/A	**bu/A**	**bu/A**	**in**	**in**	**(1-5)**	**%**
DeKalb	DKC54-07	132.2	120.7	112.2	66	7	1	-
Dyna-Gro	M72GB71	127.8	107.8	101.2	59	3	3	-
Dyna-Gro	M70GR37 (GX22937)	121.9	115.4	-	54	13	2	-
BH Genetics	BH 5755	115.6	-	-	63	8	1	-
Dyna-Gro	M71GB91	114.4	113.4	100.0	62	8	1	-
DeKalb	DKC45-60	113.2	91.1	88.4	57	9	3	-
Dyna-Gro	M67GB87	111.3	105.8	95.8	56	6	1	-
DeKalb	DKC50-07	110.4	109.3	102.4	62	3	1	-
DeKalb	DKC51-01	101.9	89.2	84.7	58	6	1	
BH Genetics	BH 4220	96.4	-	-	53	6	3	-
BH Genetics	BH 4041	95.7	-	-	49	5	1	-
Dyna-Gro	M66GR32 (GX22932)	92.9	104.1	97.5	57	7	1	-
Dyna-Gro	M62GB36 (GX22936)	91.7	83.2	-	51	6	4	-
Dyna-Gro	M63GB78	89.0	92.3	71.8	56	8	4	-
Dyna-Gro	GX24991 *	18.9	-	-	43	7	2	40
MEAN		102.2						
CV		10.0						
R^2		88.0						
LSD (0.05)		15.4						
Error DF		45						

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

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MS AGRICULTURAL AND FORESTRY EXPERIMENT STATION

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