MISSISSIPPI GRAIN SORGHUM
HYBRID TRIALS, 2018

Information Bulletin 534 • December 2018

MISSISSIPPI'S OFFICIAL VARIETY TRIALS

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This Mississippi Agricultural and Forestry Experiment Station information bulletin is a summary of research conducted under project number MIS 1414 at locations shown on the map on the second page. It is intended for colleagues, cooperators, and sponsors. The interpretation of data presented in this report may change after additional experimentation. Information included is not to be construed as a recommendation for use or as an endorsement of a specific product by Mississippi State University or the Mississippi Agricultural and Forestry Experiment Station.

This report contains data generated as part of the Mississippi Agricultural and Forestry Experiment Station research program. Joint sponsorship by the organizations listed on page 2 is gratefully acknowledged.

Trade names of commercial products used in this report are included only for clarity and understanding. All available names (i.e., trade names, chemical names, etc.) of products used in this research project are listed on page 2.

Mississippi Grain Sorghum Hybrid Trials, 2018

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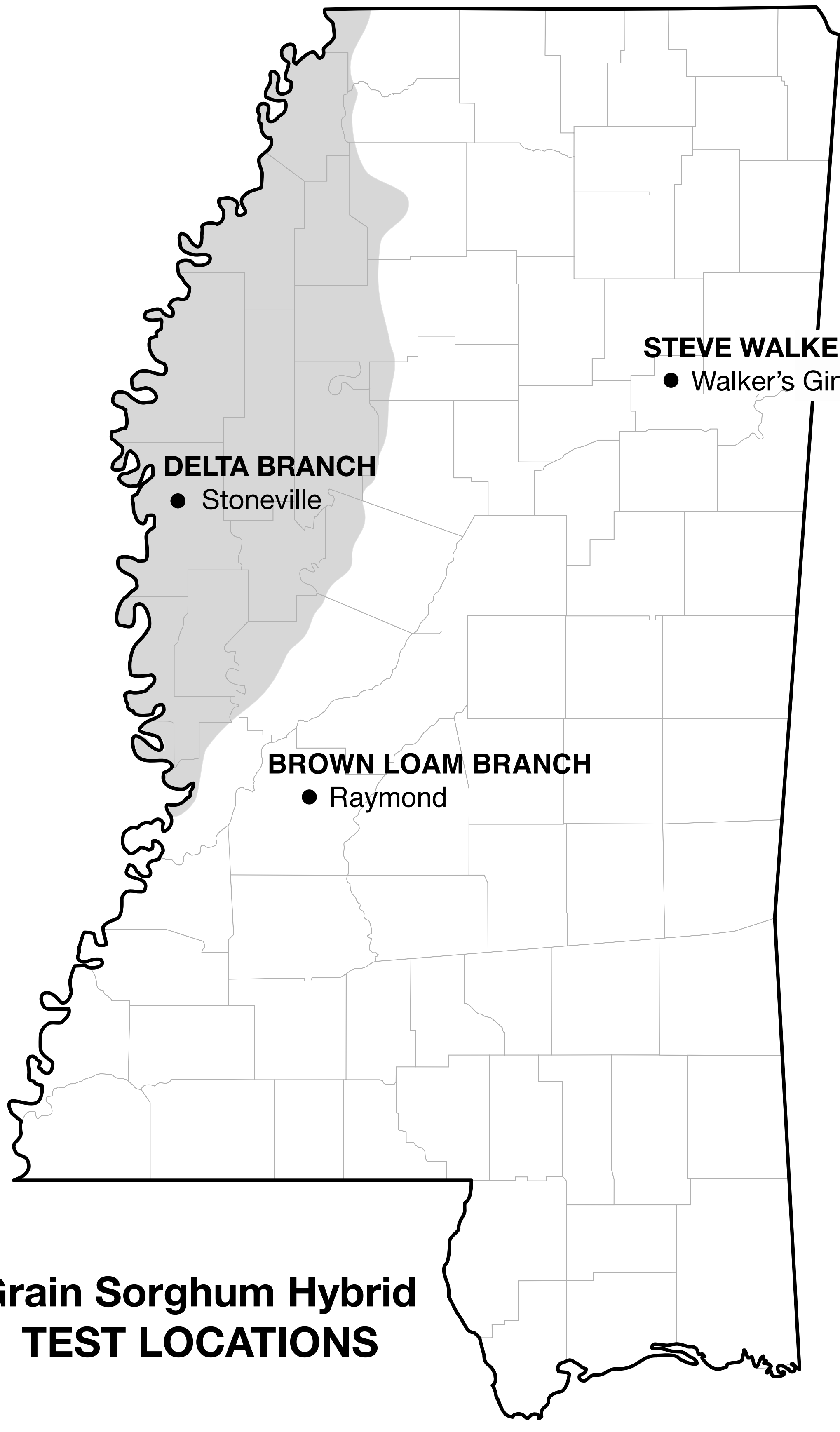
This document was approved for publication as Information Bulletin 534 of the Mississippi Agricultural and Forestry Experiment Station. It was published by the Office of Agricultural Communications, a unit of the Mississippi State University Division of Agriculture, Forestry, and Veterinary Medicine.

Our website address is ***mafes.msstate.edu/variety-trials***.



Grain Sorghum Hybrid
TEST LOCATIONS

Mississippi Grain Sorghum Hybrid Trials, 2018

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, 2018.

Brand	Hybrid	Nonirrigated planting rate (x1000)	Irrigated planting rate (x1000)
Dekalb	DKS54-00	85	85
Dekalb	DKS53-67	85	85
Dekalb	DKS53-53	85	85
Dekalb	DKS51-01	85	85
Dyna-Gro	M60GB31	85	120
Dyna-Gro	M69GR88	85	120
Dyna-Gro	M73GR55	85	120
Dyna-Gro	Dual Forage SCA	85	120
Dyna-Gro	M74GB17	85	120
Dyna-Gro	GX17227	85	120
Dyna-Gro	GX17948	85	120
Dyna-Gro	GX17968	85	120
Dyna-Gro	GX16833	85	120
Dyna-Gro	GX17379	85	120
Dyna-Gro	GX17962	85	120
Pioneer	84P80	85	95
Pioneer	83P99	85	95
Pioneer	83P17	85	95
Sorghum Partners	SP 74C40	60	100
Sorghum Partners	SP 68M57	60	100
Sorghum Partners	SP 7715	60	100
Terral Seed	REV 9924	85	95
Terral Seed	REV 9782	85	95
Terral Seed	REV 9562	85	95

Table 2. 2018 yield summary of grain sorghum hybrid trials in Mississippi.					
Brand	**Hybrid**	**Raymond**	**Stoneville**	**Walker's Gin**	**Overall avg.**
		bu/A	*bu/A*	*bu/A*	*bu/A*
DeKalb	DKS51-01	125.8	98.7	78.1	100.9
DeKalb	DKS53-53	130.3	105.0	61.4	98.9
DeKalb	DKS53-67	139.6	109.2	56.2	101.7
DeKalb	DKS54-00	126.1	97.8	46.5	90.1
Dyna-Gro	Dual Forage SCA	112.5	76.3	63.6	84.2
Dyna-Gro	GX16833	117.9	87.1	63.0	89.4
Dyna-Gro	GX17227	121.3	99.4	71.2	97.3
Dyna-Gro	GX17379	109.6	86.5	95.2	97.1
Dyna-Gro	GX17948	117.3	104.7	52.5	91.5
Dyna-Gro	GX17962	137.2	102.2	62.6	100.7
Dyna-Gro	GX17968	149.0	91.4	108.4	116.3
Dyna-Gro	M60GB31	115.7	84.2	43.7	81.2
Dyna-Gro	M69GR88	120.1	87.9	108.9	105.6
Dyna-Gro	M73GR55	123.3	98.2	88.2	103.2
Dyna-Gro	M74BG17	106.4	76.1	81.8	88.1
Pioneer	83P17	130.2	97.5	87.2	105.0
Pioneer	83P99	149.9	97.0	60.5	102.5
Pioneer	84P80	144.1	94.3	81.0	106.5
Sorghum Partners	SP 68M57	119.7	88.3	33.8	80.6
Sorghum Partners	SP 74C40	109.6	84.6	56.8	83.7
Sorghum Partners	SP 7715	133.9	74.5	76.4	94.9
Terral Seed	REV 9562	132.4	89.7	47.3	89.8
Terral Seed	REV 9782	135.7	105.2	47.4	96.1
Terral Seed	REV 9924	121.1	87.0	106.0	104.7
Mean		126.2	92.4	69.5	96.0
CV		13.2	10.5	15.8	
LSD (0.05)		23.5	13.8	15.6	
R^2		54.2	57.7	84.3	
Error DF		69	69	69	

Table 3. Two-year summary of grain sorghum hybrid trials in Mississippi.				
Brand	**Hybrid**	**Stoneville**	**Walker's Gin**	**Overall average**
		bu/A	*bu/A*	*bu/A*
DeKalb	DKS51-01	114.9	88.3	101.6
DeKalb	DKS53-53	117.3	82.2	99.7
DeKalb	DKS53-67	118.7	80.9	99.8
DeKalb	DKS54-00	105.9	63.6	84.8
Dyna-Gro	M60GB31	94.0	74.1	84.1
Dyna-Gro	M73GR55	116.2	94.7	105.5
Dyna-Gro	M74BG17	97.2	89.8	93.5
Pioneer	83P17	108.1	86.3	97.2
Pioneer	83P99	108.8	76.8	92.8
Pioneer	84P80	107.4	93.7	100.5
Sorghum Partners	SP 7715	87.1	85.2	86.1
Terral Seed	REV 9562	103.8	68.6	86.2
Terral Seed	REV 9782	114.7	71.9	93.3
Terral Seed	REV 9924	99.9	98.7	99.3
Overall Mean		106.7	82.5	94.6

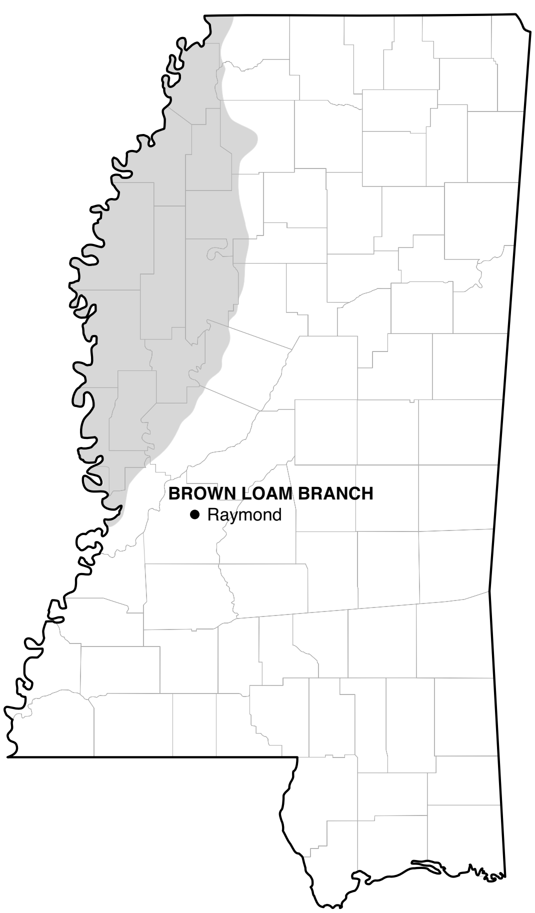
Table 4. Three-year average of grain sorghum hybrid trials in Mississippi.				
Brand	**Hybrid**	**Stoneville**	**Walker's Gin**	**Overall average**
		bu/A	*bu/A*	*bu/A*
DeKalb	DKS51-01	108.5	96.4	102.4
DeKalb	DKS53-53	114.9	94.8	104.9
DeKalb	DKS53-67	112.3	98.6	105.5
DeKalb	DKS54-00	105.6	81.9	93.8
Dyna-Gro	M60GB31	89.0	85.6	87.3
Pioneer	83P17	107.7	102.1	104.9
Pioneer	83P99	108.5	90.4	99.5
Pioneer	84P80	104.7	107.2	106.0
Sorghum Partners	SP 7715	89.6	98.4	94.0
Terral Seed	REV 9562	104.8	74.7	89.8
Terral Seed	REV 9782	109.5	79.9	94.7
Terral Seed	REV 9924	97.4	102.9	100.1
Overall Mean		104.4	92.7	98.6

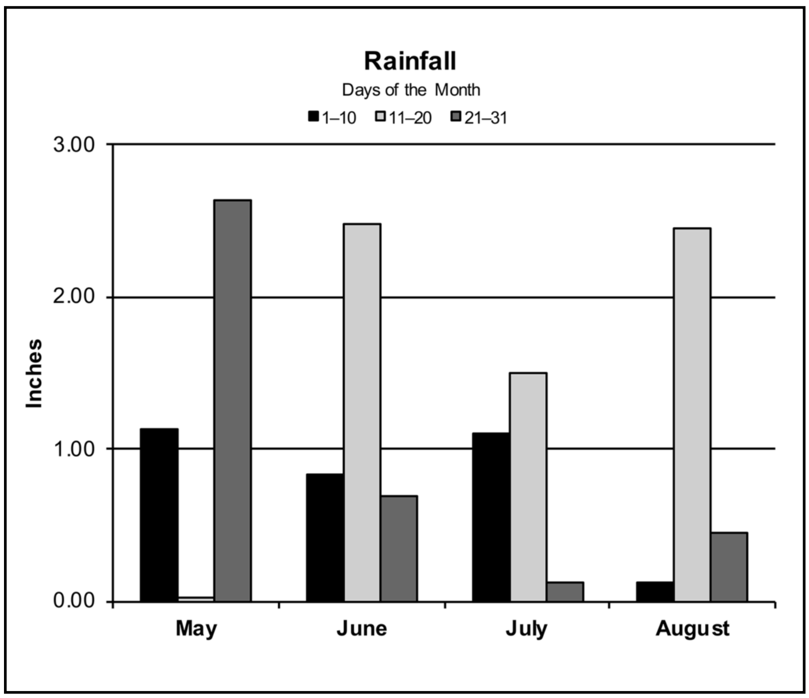
MAFES BROWN LOAM BRANCH, RAYMOND

Crop Summary

Grain sorghum plots were planted into a stale seedbed that had been prepared the previous fall. Soil moisture at planting was ideal for germination and quick emergence. All plots emerged to a uniform stand. Insecticide applications kept insect pressure to a minimum, and timely rainfall during the growing season provided adequate soil moisture to prevent drought stress. These plots were sprayed with a desiccant prior to harvest to aid with any late-season weeds and to allow for an easier harvest. Plots were harvested in a timely manner, and good yields were observed.

Planting date . . . May 9
Harvest date . . . . August 31
Soil type . . . . Loring silt loam
Soil pH 5.7
Soil fertility . . . . . P= M, K= M
Fertilizer . . . . N @ 50 lb/A (46-0-0) on May 30 and N @ 55 lb/A (46-0-0) on June 15
Herbicide . . . . . . Preemergence — Lexar @ 3 qt/A and Gramoxone @ 1 qt/A on May 9
Desiccant — Roundup PowerMAX @ 32 oz/A on August 14
Insecticide . . . . . Prevathon @ 14 oz/A, Grizzly (Lambda-Cyhalothrin) @ 2.9 oz/A, and Sivanto @ 6 oz/A (sugarcane aphids, midge, headworms) on July 24
Previous crop . . . Soybeans





Rainfall Summary

	Inches
May	**3.81**
June	**4.00**
July	**2.73**
August	**3.03**
Total	**13.57**

Table 5. Performance results of 24 hybrids grown at MAFES Brown Loam Branch, Raymond, 2018.								
Brand	**Hybrid**	**2018 yield**	**2-year average[1]**	**3-year average[2]**	**Plant height**	**Head exertion**	**Head compactness**	**Moisture content**
		bu/A	*bu/A*	*bu/A*	*in*	*in*	*(1-5)*	*%*
Pioneer	83P99	149.9	—	—	50	2	2	14.7
Dyna-Gro	GX17968	149.0	—	—	59	7	3	14.9
Pioneer	84P80	144.1	—	—	56	5	5	14.9
DeKalb	DKS53-67	139.6	—	—	53	1	2	14.7
Dyna-Gro	GX17962	137.2	—	—	49	4	5	14.6
Terral Seed	REV 9782	135.7	—	—	53	3	5	13.5
Sorghum Partners	SP 7715	133.9	—	—	57	4	3	15.0
Terral Seed	REV 9562	132.4	—	—	48	2	5	14.5
DeKalb	DKS53-53	130.3	—	—	54	2	2	14.6
Pioneer	83P17	130.2	—	—	61	3	2	15.4
DeKalb	DKS54-00	126.1	—	—	59	5	3	14.4
DeKalb	DKS51-01	125.8	—	—	58	5	5	14.7
Dyna-Gro	M73GR55	123.3	—	—	61	6	2	15.0
Dyna-Gro	GX17227	121.3	—	—	62	3	2	15.3
Terral Seed	REV 9924	121.1	—	—	62	2	5	13.9
Dyna-Gro	M69GR88	120.1	—	—	49	3	3	14.8
Sorghum Partners	SP 68M57	119.7	—	—	51	3	2	14.8
Dyna-Gro	GX16833	117.9	—	—	52	1	3	14.8
Dyna-Gro	GX17948	117.3	—	—	51	2	2	14.6
Dyna-Gro	M60GB31	115.7	—	—	54	3	5	15.2
Dyna-Gro	Dual Forage SCA	112.5	—	—	51	2	1	14.8
Dyna-Gro	GX17379	109.6	—	—	54	2	3	15.0
Sorghum Partners	SP 74C40	109.6	—	—	54	1	2	15.3
Dyna-Gro	M74GB17	106.4	—	—	52	3	5	14.8
Mean		124.1						
CV		13.2						
LSD (0.05)		23.5						
R^2		54.2						
Error DF		69						

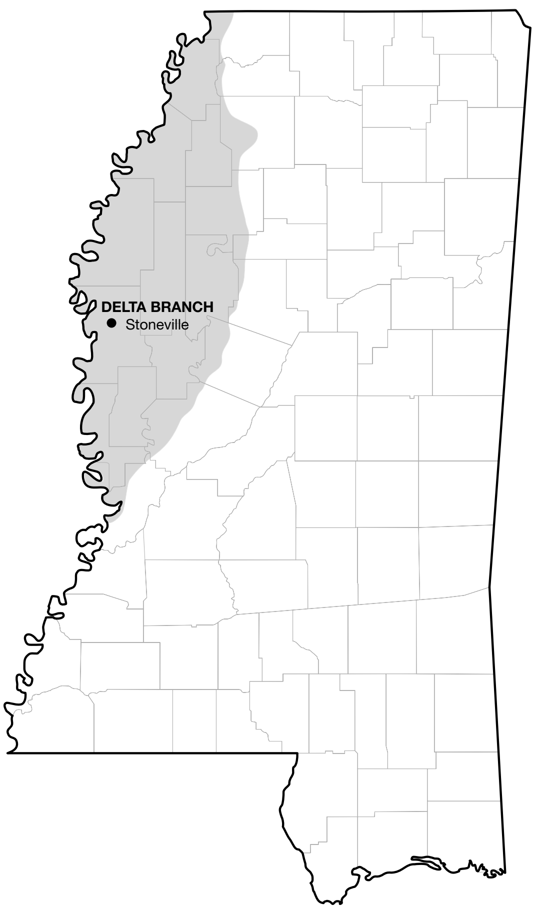
[1]No 2-year averages.
[2]No 3-year averages.

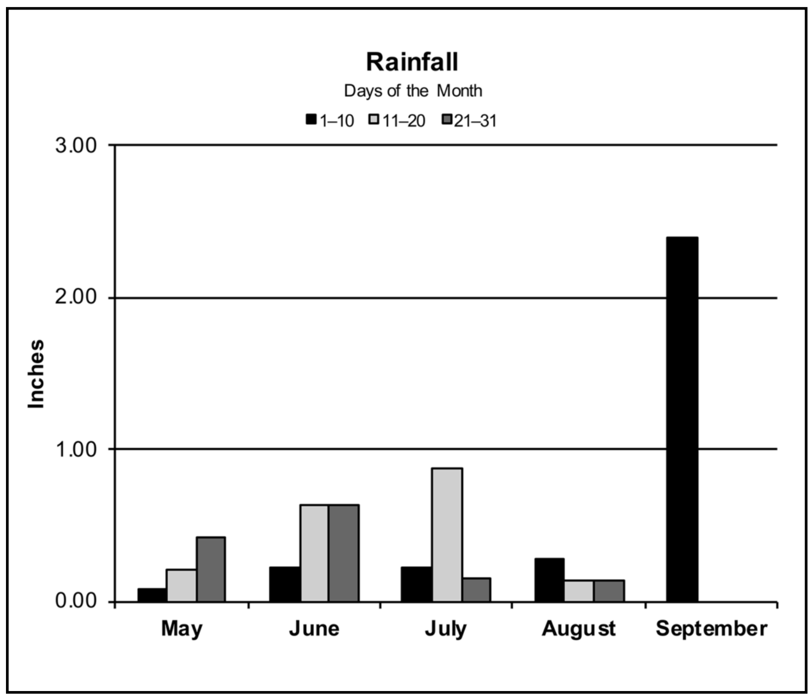
MAFES DELTA BRANCH, STONEVILLE

Crop Summary

Grain sorghum plots were planted into a well-prepared seedbed that was do-alled just prior to planting. Soil moisture was optimum at planting for germination. All plots emerged to a good stand after planting. Timely insecticide applications were able to control aphids and midge. Harvest was completed in a timely manner.

Planting date . . .May 9
Harvest date . . . .September 14
Soil type . . . . . . .Bosket and Beulah very fine sandy loam
Soil pH 6.8
Soil fertility . . . . .P= H, K= H
Fertilizer . . . . . . .N @ 120 lb/A (Urea) on June 4
Herbicide . . . . . . .Preemergence — Atrazine @ 1.5 qt/A and Dual II Magnum @ 1.33 pt/A on May 9
Insecticide . . . . .Sivanto @ 4 oz/A and Karate Z @ 2.5 oz/A on July 3 (sugarcane aphids and midge); Karate Z @ 2.5 oz/A on July 9 (midge)
Previous crop . . .Peanuts





Rainfall Summary

	Inches
May	0.71
June	1.51
July	1.26
August	0.57
September	2.40
Total	6.45

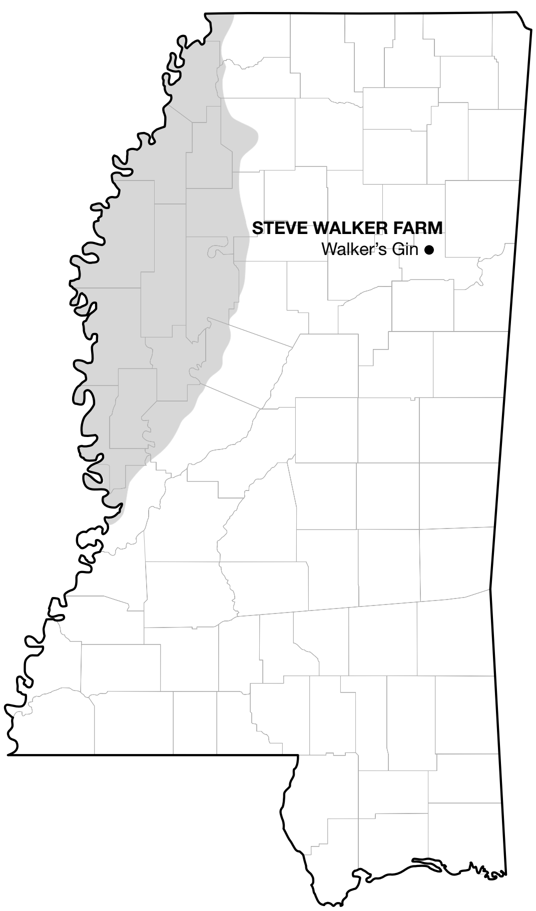
Table 6. Performance results of 24 hybrids grown at MAFES Delta Branch, Stoneville, 2018.								
Brand	**Hybrid**	**2018 yield**	**2-year average**	**3-year average**	**Plant height**	**Head exertion**	**Head compactness**	**Moisture content**
		bu/A	*bu/A*	*bu/A*	*in*	*in*	*(1-5)*	*%*
DeKalb	DKS53-67	109.2	118.7	112.3	59	7	2	12.0
Terral Seed	REV 9782	105.2	114.7	109.5	48	5	2	13.8
DeKalb	DKS53-53	105.0	117.3	114.9	54	4	4	11.4
Dyna-Gro	GX17948	104.7	—	—	55	7	1	11.5
Dyna-Gro	GX17962	102.2	—	—	59	7	5	11.0
Dyna-Gro	GX17227	99.4	—	—	68	8	1	15.3
DeKalb	DKS51-01	98.7	114.9	108.5	61	8	3	11.9
Dyna-Gro	M73GR55	98.2	116.2	—	63	4	1	14.8
DeKalb	DKS54-00	97.8	105.9	105.6	62	8	3	11.3
Pioneer	83P17	97.5	108.1	107.7	59	8	2	13.3
Pioneer	83P99	97.0	108.8	108.5	55	8	4	11.2
Pioneer	84P80	94.3	107.4	104.7	51	3	3	11.0
Dyna-Gro	GX17968	91.4	—	—	68	8	3	11.2
Terral Seed	REV 9562	89.7	103.8	104.8	49	8	3	10.9
Sorghum Partners	SP 68M57	88.3	—	—	54	7	2	11.3
Dyna-Gro	M69GR88	87.9	—	—	55	8	3	11.0
Dyna-Gro	GX16833	87.1	—	—	55	5	2	12.0
Terral Seed	REV 9924	87.0	99.9	97.4	55	6	3	10.8
Dyna-Gro	GX17379	86.5	—	—	58	4	2	12.5
Sorghum Partners	SP 74C40	84.6	—	—	57	7	3	12.0
Dyna-Gro	M60GB31	84.2	94.0	89.0	61	5	4	12.3
Dyna-Gro	Dual Forage SCA	76.3	—	—	68	7	2	12.5
Dyna-Gro	M74GB17	76.1	97.2	—	61	11	1	13.3
Sorghum Partners	SP 7715	74.5	87.1	89.6	66	7	1	13.5
Mean		92.4						
CV		10.5						
LSD (0.05)		13.8						
R^2		57.7						
Error DF		69						

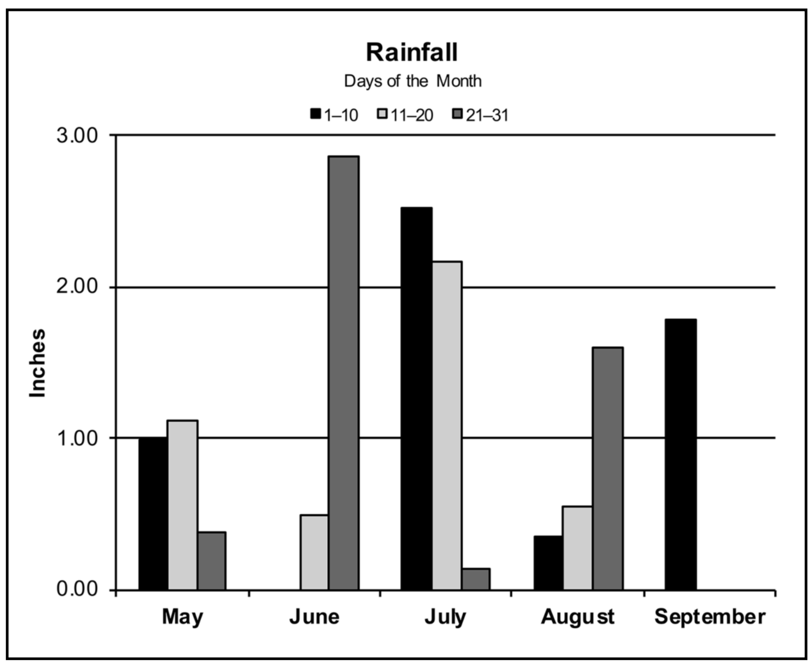
STEVE WALKER FARM, WALKER'S GIN

Crop Summary

Sorghum plots were planted into a stale seedbed that was prepared the previous fall. Soil moisture at planting was adequate for germination. All plots emerged to a stand. The plots experienced several dry periods during the growing season. Harvest was completed in a timely manner.

Planting date . . .May 4
Harvest date . . . .September 13
Soil type . . . . . . .Mathiston silt loam
Soil pH 5.7
Soil fertility . . . . .P= M, K= M
Fertilizer . . . . . . .N @ 70 lb/A (Urea) and 0-23-30 @ 200 lb/A
Herbicide . . . . . .Preemergence — Lexar @ 2 qt/A and Roundup PowerMAX @ 1 qt/A on May 4
Postemergence — Atrazine @ 1 qt/A, Me-Too Lachlor II (Metolachlor) @ 1 pt/A, and Facet L @ 24 oz/A
Insecticide . . . . .Sivanto @ 6 oz/A and Besiege @ 8 oz/A on July 23 (sugarcane aphids, midge, headworms)
Previous crop . . .Soybeans





Rainfall Summary

	Inches
May	**2.49**
June	**3.37**
July	**4.84**
August	**2.52**
September	**1.78**
Total	**15.00**

Table 7. Performance results for 24 hybrids grown at Steve Walker Farm, Walker's Gin, 2018.								
Brand	**Hybrid**	**2018 yield**	**2-year average**	**3-year average**	**Plant height**	**Head exertion**	**Head compactness**	**Moisture content**
		bu/A	*bu/A*	*bu/A*	*in*	*in*	*(1-5)*	*%*
Dyna-Gro	M69GR88	108.9	—	—	53	1	1	13.6
Dyna-Gro	GX17968	108.4	—	—	57	2	2	14.7
Terral Seed	REV 9924	106.0	98.7	102.9	52	4	1	13.9
Dyna-Gro	GX17379	95.2	—	—	55	3	1	14.2
Dyna-Gro	M73GR55	88.2	94.7	—	52	5	2	16.2
Pioneer	83P17	87.2	86.3	102.1	54	5	1	15.4
Dyna-Gro	M74GB17	81.8	89.8	—	48	1	1	15.3
Pioneer	84P80	81.0	93.7	107.2	53	1	2	14.7
DeKalb	DKS51-01	78.1	88.3	96.4	54	2	1	15.2
Sorghum Partners	SP 7715	76.4	85.2	98.4	56	4	1	15.8
Dyna-Gro	GX17227	71.2	—	—	49	2	3	16.4
Dyna-Gro	Dual Forage SCA	63.6	—	—	51	3	3	15.2
Dyna-Gro	GX16833	63.0	—	—	47	3	3	15.5
Dyna-Gro	GX17962	62.6	—	—	55	2	1	14.4
DeKalb	DKS53-53	61.4	82.2	94.8	57	3	1	13.9
Pioneer	83P99	60.5	76.8	90.4	55	2	2	14.3
Sorghum Partners	SP 74C40	56.8	—	—	62	2	2	15.2
DeKalb	DKS53-67	56.2	80.9	98.6	55	3	2	14.3
Dyna-Gro	GX17948	52.5	—	—	57	2	2	14.8
Terral Seed	REV 9782	47.4	71.9	79.9	54	1	3	14.0
Terral Seed	REV 9562	47.3	68.6	74.7	54	2	2	14.5
DeKalb	DKS54-00	46.5	63.6	81.9	65	7	1	14.2
Dyna-Gro	M60GB31	43.7	74.1	85.6	54	4	3	12.9
Sorghum Partners	SP 68M57	33.8			57	3	1	12.9
Mean		69.5						
CV		15.8						
LSD (0.05)		15.6						
R^2		84.3						
Error DF		69						

MISSISSIPPI STATE UNIVERSITY™

MS AGRICULTURAL AND FORESTRY EXPERIMENT STATION

The mission of the Mississippi Agricultural and Forestry Experiment Station and the College of Agriculture and Life Sciences is to advance agriculture and natural resources through teaching and learning, research and discovery, service and engagement which will enhance economic prosperity and environmental stewardship, to build stronger communities and improve the health and well-being of families, and to serve people of the state, the region and the world.

George M. Hopper, Director **www.mafes.msstate.edu**