MISSISSIPPI GRAIN SORGHUM

HYBRID TRIALS, 2017

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Mississippi Grain Sorghum Hybrid Trials, 2017

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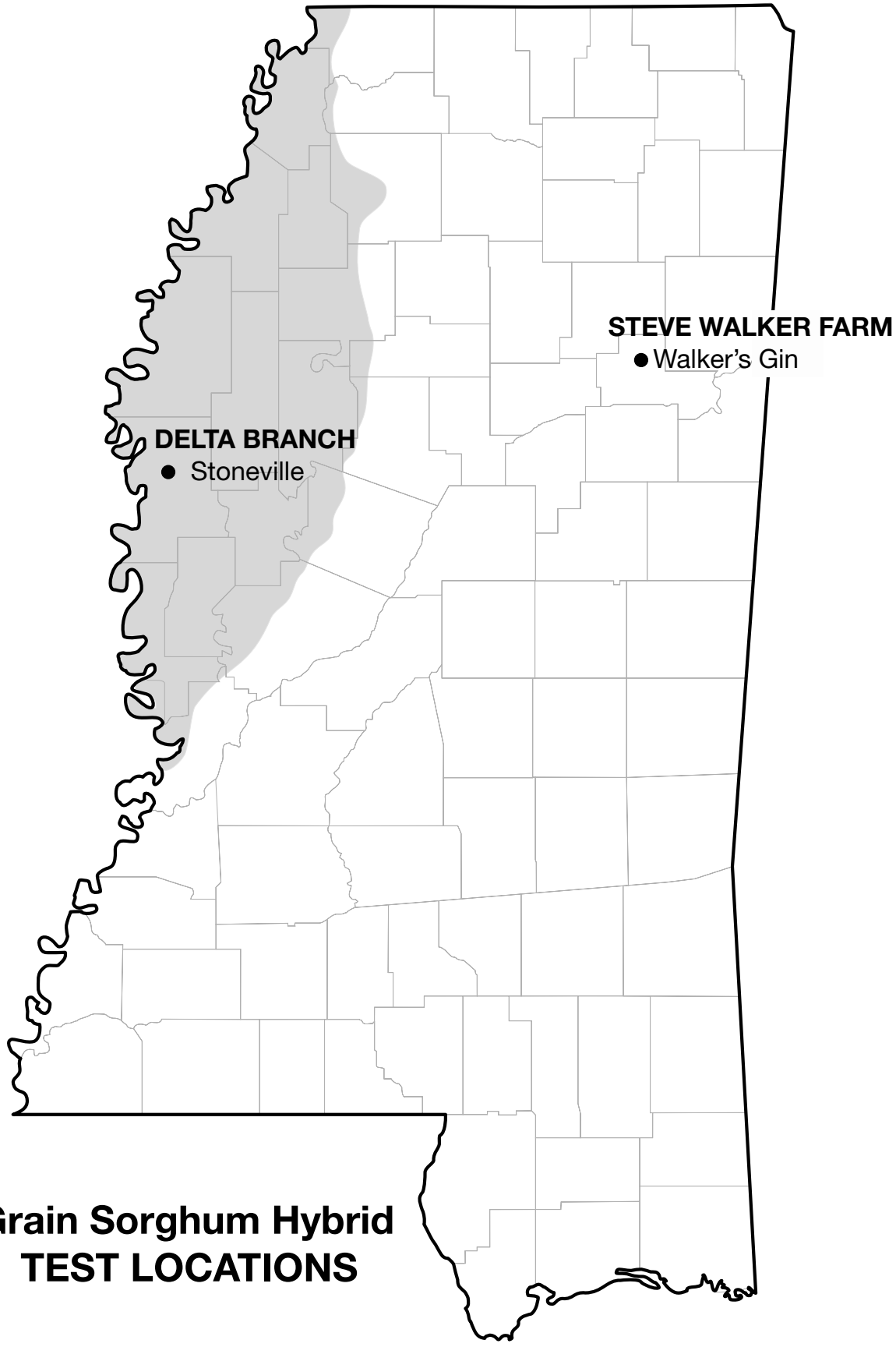
Our website address is ***mafes.msstate.edu/variety-trials***.



Grain Sorghum Hybrid TEST LOCATIONS

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

Table 2. 2017 yield 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	131.0	98.5	114.8
DeKalb	DKS53-53	129.5	102.9	116.2
DeKalb	DKS53-67	128.3	105.7	117.0
DeKalb	DKS54-00	114.1	80.7	97.4
Dyna-Gro	GX15371	119.3	104.7	112.0
Dyna-Gro	GX16855	120.5	98.9	109.7
Dyna-Gro	GX17818	109.4	87.9	98.7
Dyna-Gro	M60GB31	103.9	104.6	104.2
Dyna-Gro	GX16855	105.5	93.6	99.6
Dyna-Gro	M73GR55	134.1	101.3	117.7
Dyna-Gro	M74GB17	118.3	97.8	108.0
Pioneer	83P17	118.6	85.5	102.1
Pioneer	83P99	120.6	93.1	106.9
Pioneer	84P80	120.5	106.3	113.4
Sorghum Partners	CHR0029	98.0	99.0	98.5
Sorghum Partners	CHR2042	103.2	91.8	97.5
Sorghum Partners	NK6638	103.0	69.9	86.5
Sorghum Partners	SP7715	99.6	93.9	96.8
Sorghum Partners	SP78M30	88.6	79.2	83.9
Terral	REV 9562	118.0	89.9	103.9
Terral	REV 9782	124.1	96.3	110.2
Terral	REV 9924	112.7	91.5	102.1
Mean		114.6	94.2	104.4
CV		8.0	12.1	
LSD (0.05)		13.0	15.9	
R^2		70	48	
Error DF		70	70	

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	113.4	105.5	109.4
DeKalb	DKS53-53	119.9	111.6	115.7
DeKalb	DKS53-67	113.8	119.8	116.8
DeKalb	DKS54-00	109.5	99.7	104.6
Dyna-Gro	GX15371	100.1	120.7	110.4
Dyna-Gro	M60GB31	91.4	106.5	99.0
Pioneer	83P17	112.9	109.6	111.2
Pioneer	83P99	114.3	105.3	109.8
Pioneer	84P80	109.9	120.3	115.1
Sorghum Partners	CHR0029	86.4	107.3	96.9
Sorghum Partners	CHR2042	94.3	95.9	95.1
Sorghum Partners	NK6638	93.2	80.9	87.0
Sorghum Partners	SP7715	97.1	109.3	103.2
Sorghum Partners	SP78M30	81.9	92.8	87.3
Terral	REV 9562	112.4	88.4	100.4
Terral	REV 9782	111.7	96.1	103.9
Terral	REV 9924	102.6	101.3	102.0
Mean		103.8	104.2	104.0

Table 4. Three-year average of grain sorghum hybrid trials in Mississippi.

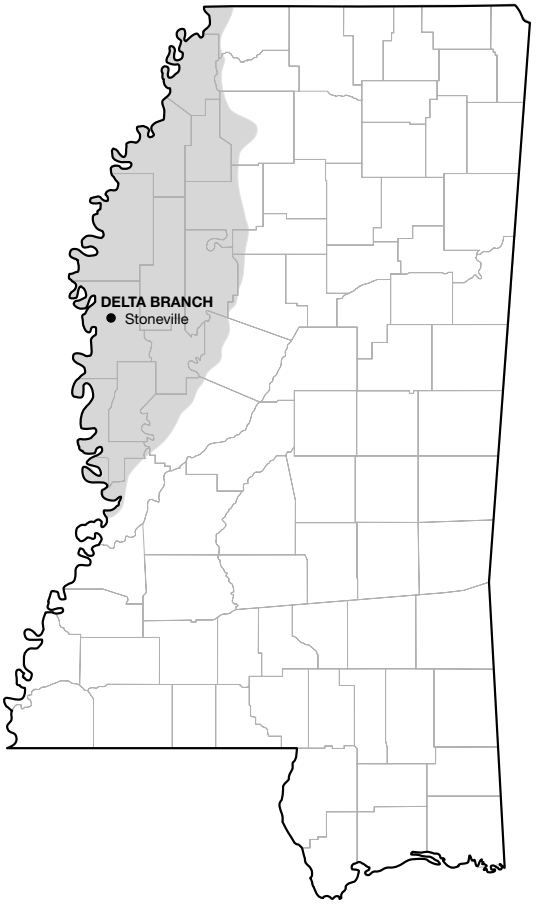
Brand	Hybrid	Stoneville	Walker's Gin	Overall average
		bu/A	*bu/A*	*bu/A*
Dyna-Gro	M60GB31	100.7	117.0	108.9
Pioneer	83P17	112.0	129.9	120.9
Pioneer	83P99	113.4	127.4	120.4
Pioneer	84P80	104.8	132.5	118.7
Sorghum Partners	NK6638	96.9	105.6	101.3
Sorghum Partners	SP7715	99.0	125.1	112.1
Terral	REV 9562	112.7	98.9	105.8
Terral	REV 9782	119.0	109.0	114.0
Terral	REV 9924	104.1	117.1	110.6
Mean	107.0	118.1	112.5	

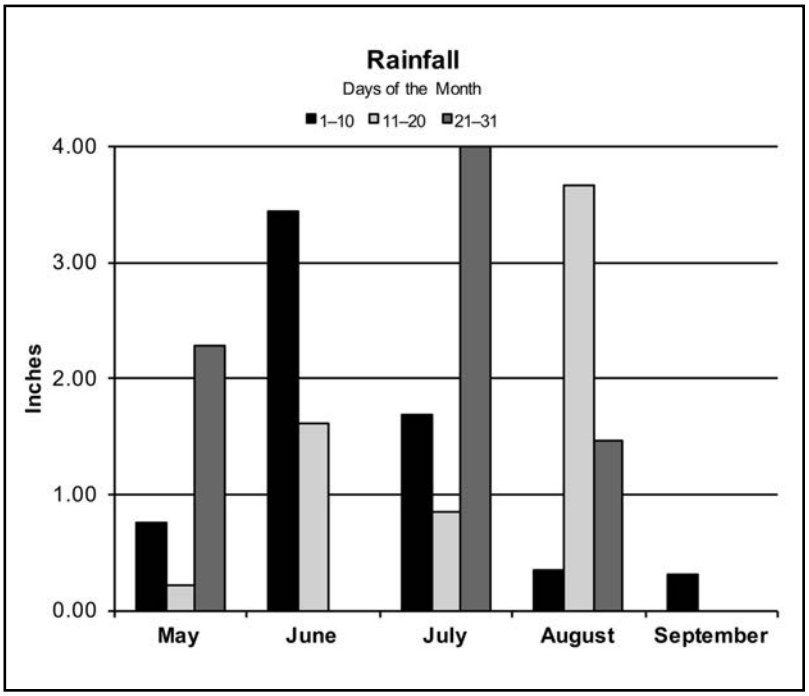
MAFES DELTA BRANCH, STONEVILLE

Crop Summary

The grain sorghum plots were planted into a well-prepared seedbed where the tops of the beds were do-alled just prior to planting. Soil moisture was adequate at planting, and all plots germinated quickly and emerged to a stand. Three insecticide applications were made to prevent any damage from pests during the season. The plots were harvested in a timely manner without difficulties.

Planting date . . . .May 9
Harvest date . . . .September 8
Soil type . . . . . .Bosket and Beulah very fine sandy loam
Soil pH 6.8
Soil fertility . . . . . .P= H, K= H
Fertilizer . . . . . .N @ 120 lb/A (32% UAN)
Herbicides . . . . . .Preemergence — Atrazine @ 1 qt/A and Dual II Magnum @ 1.33 pt/A
Postemergence — Plow and Layby with Atrazine @ 1 qt/A + Dual @ 1/33 pt/A on June 14
Insecticides . . . . .Karatez @ 2 oz/A (Midge) on July 5 and July 10; Transform @ 1 oz/A (sugarcane aphid) on August 2
Previous crop . . .Cotton





Rainfall Summary

	Inches
May	3.26
June	5.06
July	6.53
August	5.48
September	0.30
Total	20.63

Table 5. Performance results of 22 hybrids grown with furrow irrigation at MAFES Delta Branch, Stoneville, 2017.

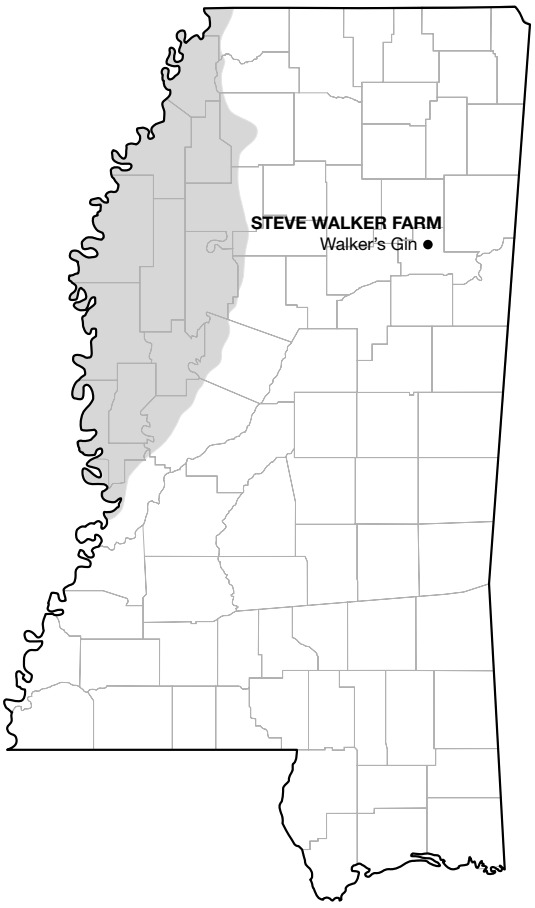
Brand	Hybrid	2017 yield	2-year average	3-year average	Plant height	Head exertion	Head compactness	Moisture content
		bu/A	*bu/A*	*bu/A*	*in*	*in*	*(1-5)*	*%*
Dyna-Gro	M73GR55	134.1	—	—	55	2	1	9.0
DeKalb	DKS51-01	131.0	113.4	—	58	6	3	8.6
DeKalb	DKS53-53	129.5	119.9	—	57	3	1	9.7
DeKalb	DKS53-67	128.3	113.8	—	58	9	2	9.6
Terral	REV 9782	124.1	111.7	119.0	49	4	2	9.0
Pioneer	83P99	120.6	114.3	113.4	51	4	1	8.6
Pioneer	84P80	120.5	109.9	104.8	54	6	4	8.5
Dyna-Gro	GX16855	120.5	—	—	55	3	1	8.5
Dyna-Gro	GX15371	119.3	100.1	—	54	4	2	8.4
Pioneer	83P17	118.6	112.9	112.0	54	3	2	9.7
Dyna-Gro	M74GB17	118.3	—	—	57	6	2	8.8
Terral	REV 9562	118.0	112.4	112.7	53	7	3	8.7
DeKalb	DKS54-00	114.1	109.5		52	6	3	9.7
Terral	REV 9924	112.7	102.6	104.1	56	4	2	8.4
Dyna-Gro	GX17818	109.4	—	—	54	4	2	8.5
Dyna-Gro	GX16855	105.5	—	—	57	5	2	8.6
Dyna-Gro	M60GB31	103.9	91.4	100.7	54	8	5	8.2
Sorghum Partners	CHR2042	103.2	94.3	—	56	4	5	10.7
Sorghum Partners	NK6638	103.0	93.2	96.9	56	4	4	7.9
Sorghum Partners	SP7715	99.6	97.1	99.0	57	5	2	9.1
Sorghum Partners	CHR0029	98.0	86.4	—	56	4	2	9.9
Sorghum Partners	SP78M30	88.6	81.9	—	51	6	4	9.0
Mean		114.6						
CV		8.0						
LSD (0.05)		13.0						
R^2		70						
Error DF		70						

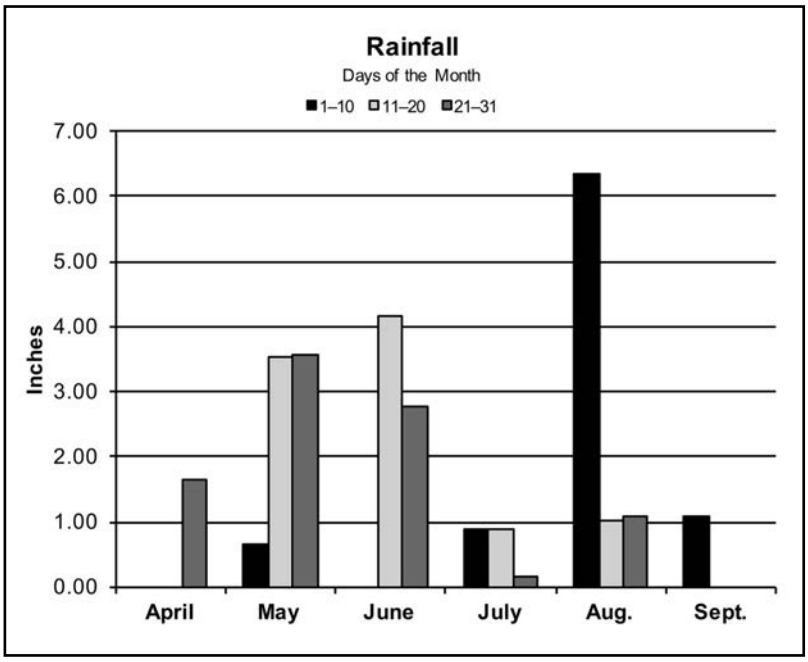
STEVE WALKER FARM, WALKER'S GIN

Crop Summary

All grain sorghum plots were planted into a stale seedbed, prepared the previous fall. Soil moisture was adequate at planting for germination. All plots emerged to a stand. Only one application of Sivanto insecticide was required during the growing season to control the presence of sugarcane aphids. Harvest was completed in a timely manner without delays.

Planting date . . . .April 25
Harvest date . . . .September 11
Soil type . . . . . .Mathiston silt loam
Soil pH 5.8
Soil fertility . . . . . .P= M, K= M
Fertilizer . . . . . .N @ 55 lb/A (Urea) and 9-23-30 @ 200 lb/A on May 3; N @ 25 lb/A (33-0-0) on June 29
Herbicides . . . . . .Preemergence — Lexar @ 2 qt/A on April 28
Postemergence — Atrazine @ 1 qt/A, Huskie @ 1 pt/A, and Me-Too Lachlor II @ 1 pt/A on May 25
Insecticides . . . . .Prevathon @ 14 oz/A (sorghum headworm) on July 19; Sivanto @ 4 oz/A (sugarcane aphid) on June 30
Previous crop . . .Soybean





Rainfall Summary

	Inches
April	1.64
May	7.77
June	6.94
July	1.93
August	8.43
September	1.09
Total	27.80

Table 6. Performance results for 22 hybrids grown without irrigation at Steve Walker Farm, Walker's Gin, 2017.

Brand	Hybrid	2017 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)*	*%*
Pioneer	84P80	106.3	120.3	132.5	56	5	5	9.1
DeKalb	DKS53-67	105.7	119.8	—	57	3	1	10.8
Dyna-Gro	GX15371	104.7	120.7	—	58	2	2	9.9
Dyna-Gro	M60GB31	104.6	106.5	117.0	50	4	5	9.0
DeKalb	DKS53-53	102.9	111.6	—	56	7	2	11.6
Dyna-Gro	M73GR55	101.3	—	—	56	5	1	10.8
Sorghum Partners	CHR0029	99.0	107.3	—	55	5	1	9.5
Dyna-Gro	GX16855	98.9	—	—	60	4	1	10.1
DeKalb	DKS51-01	98.5	105.5	—	61	4	3	9.3
Dyna-Gro	M74GB17	97.8	—	—	53	4	2	9.1
Terral	REV 9782	96.3	96.1	109.0	46	5	3	9.9
Sorghum Partners	SP7715	93.9	109.3	125.1	55	3	1	10.0
Dyna-Gro	GX16855	93.6	—	—	64	6	1	10.1
Pioneer	83P99	93.1	105.3	127.4	54	6	4	10.2
Sorghum Partners	CHR2042	91.8	95.9	—	54	6	1	10.1
Terral	REV 9924	91.5	101.3	117.1	54	5	3	9.7
Terral	REV 9562	89.9	88.4	98.9	51	8	5	9.3
Dyna-Gro	GX17818	87.9	—	—	54	5	3	9.7
Pioneer	83P17	85.5	109.6	129.9	54	3	3	11.7
DeKalb	DKS54-00	80.7	99.7	—	63	8	1	12.2
Sorghum Partners	SP78M30	79.2	92.8	—	53	4	1	10.3
Sorghum Partners	NK6638	69.9	80.9	105.6	54	2	2	9.2
Mean		94.2						
CV		12.1						
LSD (0.05)		15.9						
R^2		48						
Error DF		70						

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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.

MS AGRICULTURAL AND
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