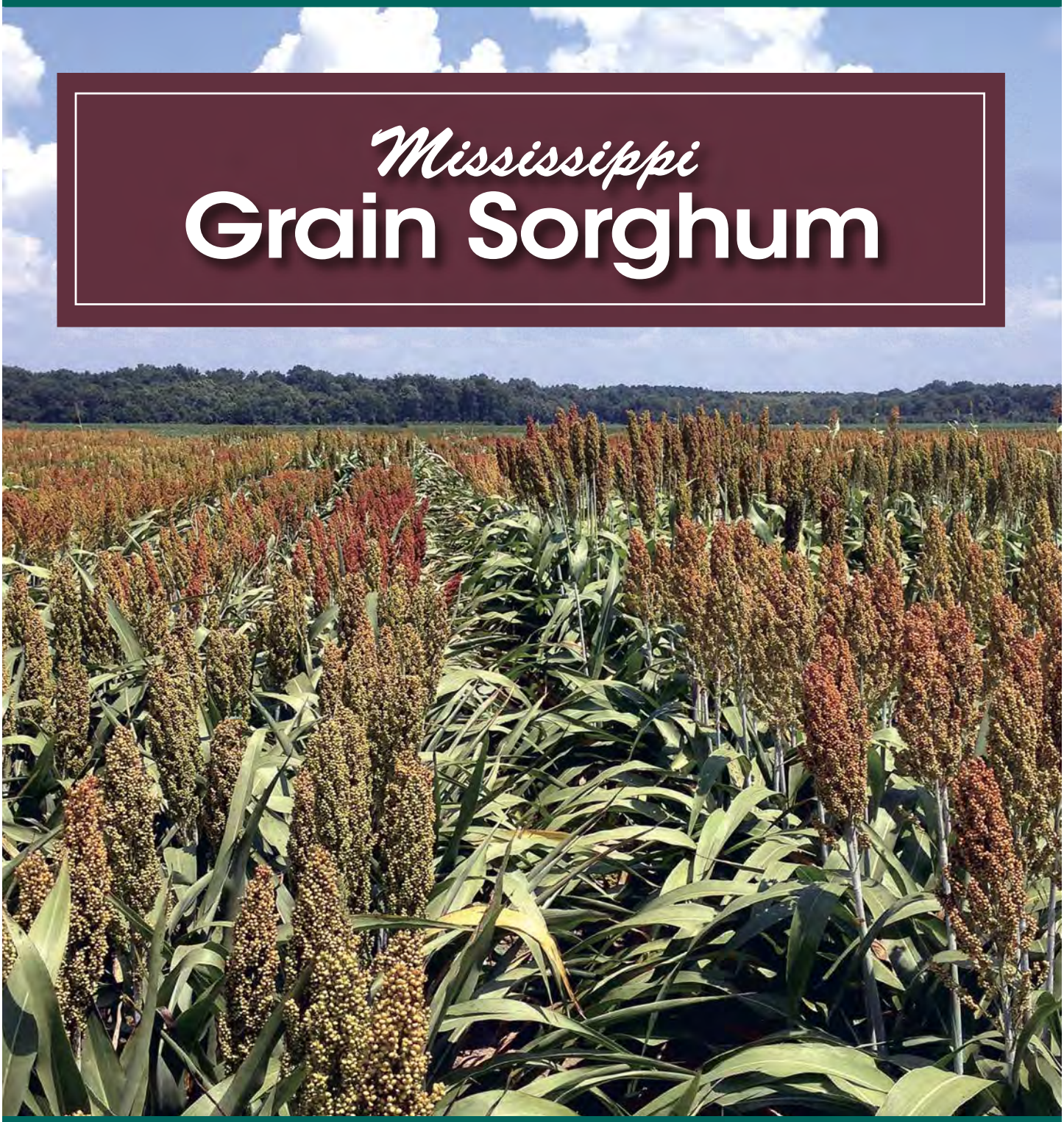
Information Bulletin 503 November 2015

Mississippi Grain Sorghum



HYBRID TRIALS, 2015

Mississippi's Official Variety Trials

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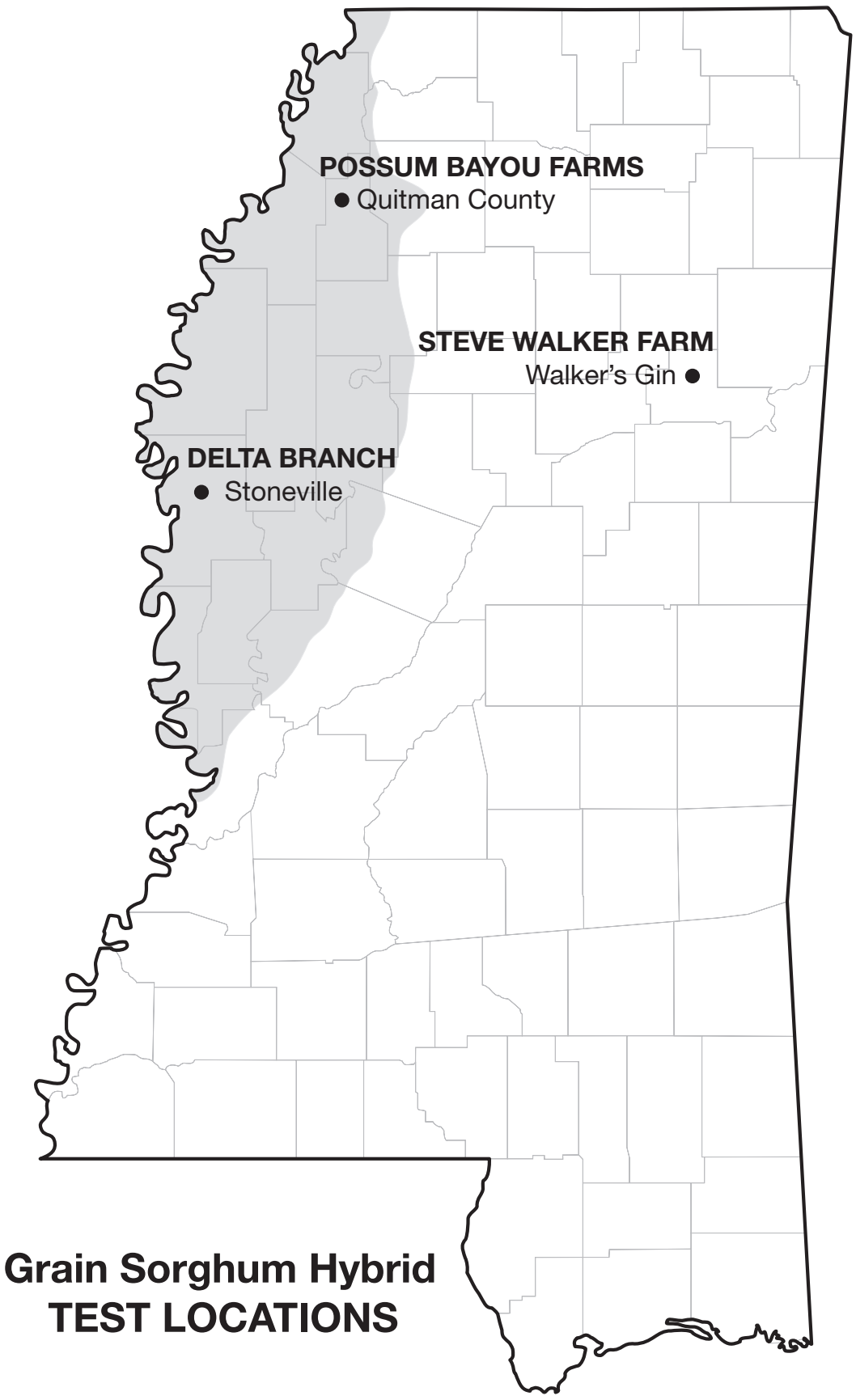
Our website address is ***mafes.msstate.edu/variety-trials***.



Grain Sorghum Hybrid TEST LOCATIONS

Mississippi Grain Sorghum Hybrid Trials, 2015

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, 2015.

Company	Brand	Hybrid	Nonirrigated planting rate (x1000)	Irrigated planting rate (x1000)
Crop Production Services	Dyna-Gro	M77GB52	75	85
Crop Production Services	Dyna-Gro	765B	75	85
Crop Production Services	Dyna-Gro	M77GR61	75	85
Crop Production Services	Dyna-Gro	GX13231	75	85
Sorghum Partners	Sorghum Partners	SP7868	60	90
Sorghum Partners	Sorghum Partners	NK6638	60	90
Sorghum Partners	Sorghum Partners	SP7715	60	90
Sorghum Partners	Sorghum Partners	SPX17414	60	90
Sorghum Partners	Sorghum Partners	SPX17514	60	90
Sorghum Partners	Sorghum Partners	SPX17114	60	90
Mycogen Seeds	Mycogen	1G855C	60	75
Dulaney Seed Inc.	AgVenture	AvX3934	140	140
Dulaney Seed Inc.	AgVenture	AvX3346	120	120
Dulaney Seed Inc.	AgVenture	AvX3340	120	120
Dulaney Seed Inc.	AgVenture	AvX3344	120	120
Alta Seeds	Alta Seeds	AG1203	80	80
Alta Seeds	Alta Seeds	AG2103	80	80
Alta Seeds	Alta Seeds	AG2105	80	80
Alta Seeds	Alta Seeds	AG2115	80	80
Alta Seeds	Alta Seeds	AG3101	80	80
Alta Seeds	Alta Seeds	AG3201	80	80
Alta Seeds	Alta Seeds	XG02008	80	80
Alta Seeds	Alta Seeds	XG30001	80	80
Alta Seeds	Alta Seeds	XG30002	80	80
Alta Seeds	Alta Seeds	XG30003	80	80
DuPont Pioneer	Pioneer	83P17	85	95
DuPont Pioneer	Pioneer	84P80	85	95
DuPont Pioneer	Pioneer	83P99	85	95
Terral Seed Inc.	REV	9924	85	95
Terral Seed Inc.	REV	9782	85	95
Terral Seed Inc.	REV	9562	85	95

Table 2. 2015 yield summary of grain sorghum hybrid trials in Mississippi.

Brand	Hybrid[1]	Quitman County	Stoneville	Walker's Gin	Overall average
		bu/A	*bu/A*	*bu/A*	*bu/A*
AgVenture	AvX3340	84.4	120.9	163.9	123.1
AgVenture	AvX3344	106.5	126.0	155.0	129.2
AgVenture	AvX3346	88.4	84.7	148.9	107.3
AgVenture	AvX3934	98.5	120.2	95.9	104.9
Alta Seeds	AG1203	91.3	117.4	153.8	120.8
Alta Seeds	AG2103	72.7	102.6	115.9	97.1
Alta Seeds	AG2105	75.2	110.8	152.7	112.9
Alta Seeds	AG2115	70.2	117.9	111.1	99.7
Alta Seeds	AG3101	50.5	98.6	134.6	94.6
Alta Seeds	AG3201	78.5	114.6	142.9	112.0
Alta Seeds	*XG02008*	64.9	106.0	122.3	97.7
Alta Seeds	*XG30001*	77.2	96.6	139.1	104.3
Alta Seeds	*XG30002*	85.3	104.3	144.8	111.5
Alta Seeds	*XG30003*	62.5	99.0	140.7	100.7
Dyna-Gro	765B	59.5	96.2	160.8	105.5
Dyna-Gro	*GX13231*	91.7	119.4	138.0	116.4
Dyna-Gro	M77GB52	87.0	102.1	137.0	108.7
Dyna-Gro	M77GR61	55.7	115.8	137.5	103.0
Mycogen	1G855C	97.3	113.4	147.9	119.5
Pioneer	83P17	115.6	110.4	170.4	132.1
Pioneer	83P99	60.3	111.4	171.6	114.4
Pioneer	84P80	73.7	94.7	156.8	108.4
Sorghum Partners	NK6638	100.1	104.4	155.2	119.9
Sorghum Partners	SP7715	123.4	102.7	156.7	127.6
Sorghum Partners	SP7868	62.5	106.2	151.8	106.8
Sorghum Partners	*SPX17114*	60.0	108.8	134.7	101.2
Sorghum Partners	*SPX17414*	114.8	92.2	149.0	118.7
Sorghum Partners	*SPX17514*	89.5	113.0	128.5	110.3
Terral Seed	REV 9562	72.0	113.3	119.8	101.7
Terral Seed	REV 9782	81.6	133.7	134.8	116.7
Terral Seed	REV 9924	69.6	107.2	148.5	108.4
Mean		81.3	108.5	142.6	110.8
LSD		13.7	11.9	16.1	
Error df		90	90	90	
CV		14.3	9.3	9.5	
R^2		79.2	59.7	69.6	

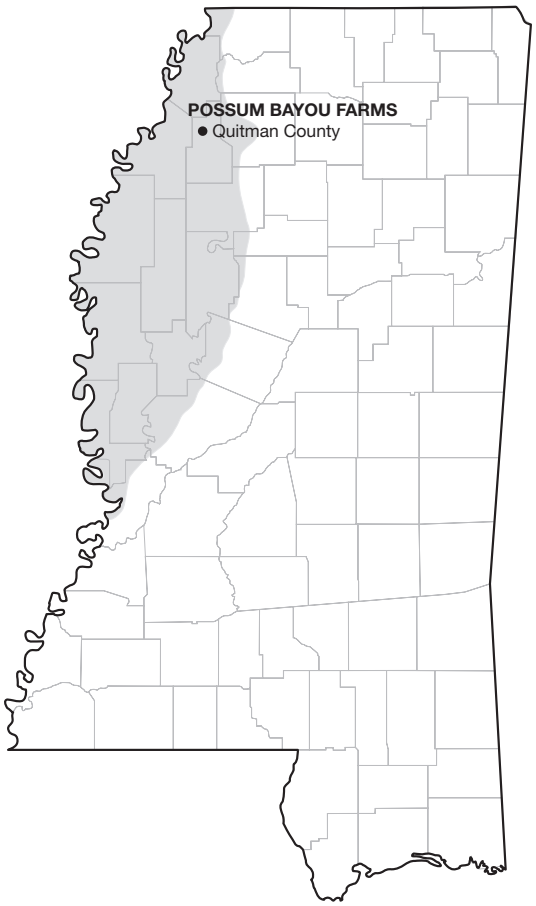
[1]Hybrid in italics denotes an experimental entry.

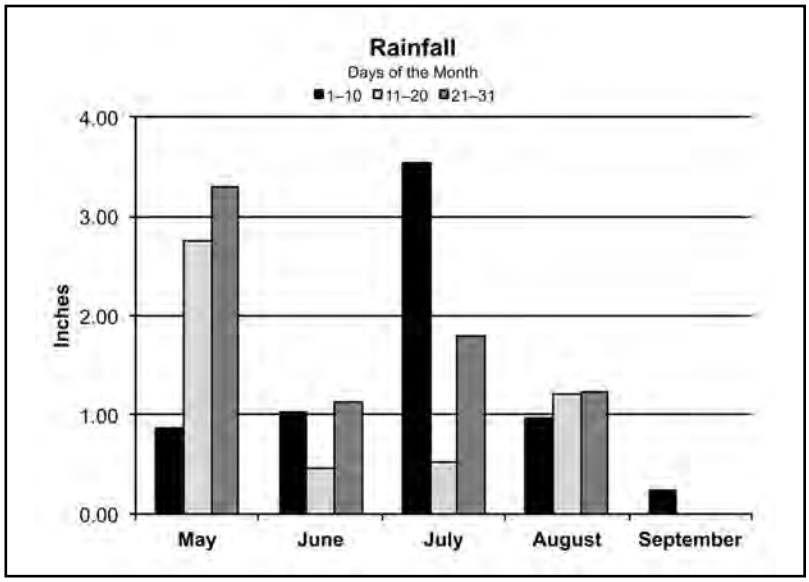
POSSUM BAYOU FARMS, QUITMAN COUNTY

Crop Summary

Sorghum plots were planted into a seedbed that had been tilled and do-alled. All plots quickly emerged to a stand. Sugarcane aphids did cause some stress at this location, but they were controlled with a timely insecticide application. Lodging was observed in some hybrids. Harvest was completed in a timely manner.

Planting date: . . . . . .May 4
Harvest date: . . . . . .September 8
Soil type: . . . . . .Dundee fine sandy loam
Soil pH: 5.9
Soil fertility: . . . . . .P= H, K= H
Fertilizer added: . . . . . .Urea @ 150 lb/A on May 14, Urea @ 150 lb/A on June 6, and Urea @ 110 lb/A on July 1
Herbicide applied: . . . . . .Dual II Magnum @ 32 oz/A and Sharpen @ 2 oz/A
Insecticide applied: . . . .Blackhawk @ 1.7 oz/A and Transform @ 1.5 oz/A on July 29
Previous crop: . . . . . .Grain Sorghum





Rainfall Summary

	Inches
May	6.91
June	2.64
July	5.86
August	3.42
September	0.25
Total	19.08

Table 3. Performance results for 31 hybrids grown without irrigation at Possum Bayou Farms, Quitman County, 2015.

Brand	Hybrid[1]	2015 yield	2-year average[2]	3-year average[2]	Plant height	Lodging score	Head exertion	Head compactness	Moisture content
		bu/A	*bu/A*	*bu/A*	*in*	*(1-5)*	*in*	*(1-5)*	*%*
Sorghum Partners	SP7715	123.4	—	—	52	1	3	1	12.9
Pioneer	83P17	115.6	—	—	59	1	2	2	13.1
Sorghum Partners	*SPX17414*	114.8	—	—	59	1	4	2	13.3
AgVenture	AvX3344	106.5	—	—	49	1	4	4	11.2
Sorghum Partners	NK6638	100.1	—	—	52	1	3	4	11.6
AgVenture	AvX3934	98.5	—	—	51	1	2	4	10.5
Mycogen	1G855C	97.3	—	—	57	1	6	1	13.1
Dyna-Gro	*GX13231*	91.7	—	—	59	1	3	3	12.1
Alta Seeds	AG1203	91.3	—	—	52	1	4	5	12.5
Sorghum Partners	*SPX17514*	89.5	—	—	60	1	3	1	14.3
AgVenture	AvX3346	88.4	—	—	61	1	6	3	11.4
Dyna-Gro	M77GB52	87.0	—	—	49	1	5	4	11.5
Alta Seeds	*XG30002*	85.3	—	—	57	1	4	1	13.5
AgVenture	AvX3340	84.4	—	—	53	1	3	4	11.0
Terral Seed	REV 9782	81.6	—	—	52	1	4	5	11.5
Alta Seeds	AG3201	78.5	—	—	52	3	2	5	11.3
Alta Seeds	*XG30001*	77.2	—	—	46	1	2	3	11.9
Alta Seeds	AG2105	75.2	—	—	56	1	6	3	12.2
Pioneer	84P80	73.7	—	—	50	1	2	5	10.8
Alta Seeds	AG2103	72.7	—	—	46	1	3	5	11.0
Terral Seed	REV 9562	72.0	—	—	56	1	2	2	11.0
Alta Seeds	AG2115	70.2	—	—	55	1	2	2	11.4
Terral Seed	REV 9924	69.6	—	—	53	1	3	2	11.0
Alta Seeds	*XG02008*	64.9	—	—	50	2	2	2	11.0
Sorghum Partners	SP7868	62.5	—	—	52	1	3	2	11.7
Alta Seeds	*XG30003*	62.5	—	—	49	1	2	2	11.6
Pioneer	83P99	60.3	—	—	52	1	3	1	11.3
Sorghum Partners	*SPX17114*	60.0	—	—	54	1	5	3	11.2
Dyna-Gro	765B	59.5	—	—	63	1	7	2	12.0
Dyna-Gro	M77GR61	55.7	—	—	55	1	3	2	11.5
Alta Seeds	AG3101	50.5	—	—	56	1	4	3	11.6
Mean		81.3							
LSD		13.7							
Error df		90							
CV		14.3							
R^2		79.2							

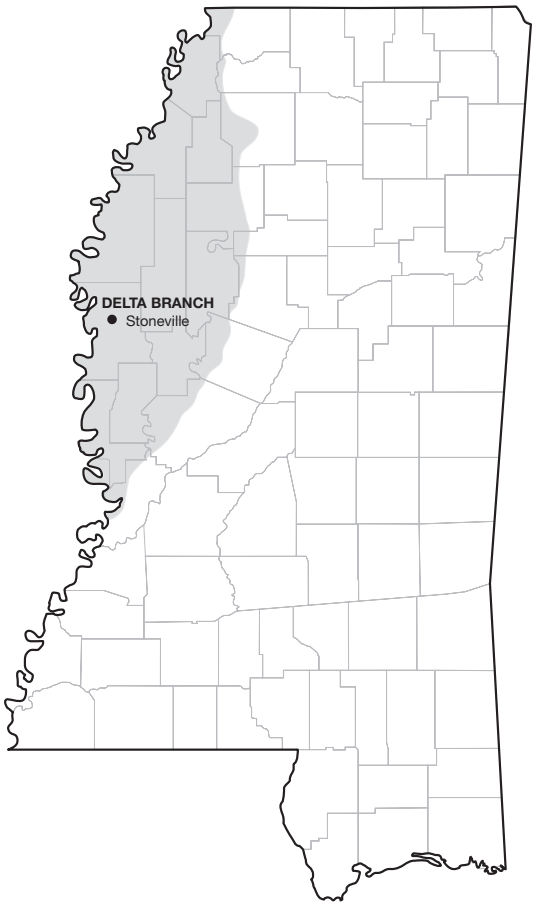
[1]Hybrid in italics denotes an experimental entry.
[2]No 2- or 3-year averages.

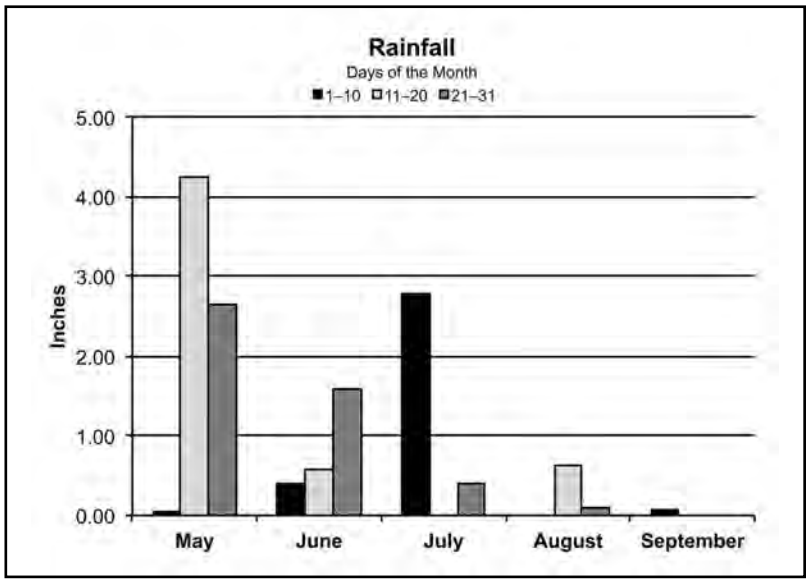
MAFES DELTA BRANCH, STONEVILLE

Crop Summary

Plots were planted into a seedbed with adequate moisture for germination. All plots quickly emerged to a stand. The combination of irrigation and rainfall allowed for sufficient soil moisture throughout the season. Some bird damage was observed in a portion of this test, but it was generally contained within the first replication. Harvest was completed in a timely manner.

Planting date: . . . . . .May 6
Harvest date: . . . . . .September 1
Soil type: . . . . . .Bosket very fine sandy loam and Dubbs silt loam
Soil pH: 6.0
Soil fertility: . . . . . .P= H, K= H
Fertilizer added: . . . . . .N @ 120 lb/A (32% UAN) on June 3
Herbicide applied: . . . . . .Preemergence — Atrazine @ 1 qt/A, Dual II Magnum @ 1.33 pt/A, and Roundup PowerMax @ 32 oz/A
Insecticide applied: . . . .Karate Z @ 1.33 oz/A on July 5, July 8, and July 15
Irrigation: . . . . . .Furrow irrigated on July 24
Desiccant: . . . . . .Defol 5 (sodium chlorate) @ 2.5 gal/A on August 28
Previous crop: . . . . . .Cotton





Rainfall Summary

	Inches
May	6.96
June	2.57
July	3.17
August	0.73
September	0.06
Total	13.49

Table 4. Performance results for 31 hybrids grown with furrow irrigation at MAFES Delta Branch, Stoneville, 2015.

Brand	Hybrid[1]	2015 yield	2-year average[2]	3-year average[2]	Plant height	Lodging score	Head exertion	Head compactness	Moisture content
		bu/A	*bu/A*	*bu/A*	*in*	*(1-5)*	*in*	*(1-5)*	*%*
Terral Seed	REV 9782	133.7	—	—	47	1	4	2	11.7
AgVenture	AvX3344	126.0	—	—	52	1	5	3	11.8
AgVenture	AvX3340	120.9	—	—	48	1	3	3	12.1
AgVenture	AvX3934	120.2	—	—	43	1	2	2	11.0
Dyna-Gro	*GX13231*	119.4	—	—	45	1	3	3	11.9
Alta Seeds	AG2115	117.9	—	—	46	1	6	4	11.3
Alta Seeds	AG1203	117.4	—	—	51	1	7	3	12.1
Dyna-Gro	M77GR61	115.8	—	—	57	1	3	3	12.2
Alta Seeds	AG3201	114.6	—	—	50	1	4	2	11.6
Mycogen	1G855C	113.4	—	—	49	1	2	2	12.3
Terral Seed	REV 9562	113.3	—	—	46	1	5	4	12.3
Sorghum Partners	*SPX17514*	113.0	—	—	39	1	3	1	11.5
Pioneer	83P99	111.4	—	—	41	1	4	1	11.4
Alta Seeds	AG2105	110.8	—	—	46	1	5	2	12.9
Pioneer	83P17	110.4	—	—	46	1	7	1	12.7
Sorghum Partners	*SPX17114*	108.8	—	—	45	1	4	1	11.1
Terral Seed	REV 9924	107.2	—	—	53	1	3	2	11.7
Sorghum Partners	SP7868	106.2	—	—	47	1	6	1	11.5
Alta Seeds	*XG02008*	106.0	—	—	48	1	5	2	12.0
Sorghum Partners	NK6638	104.4	—	—	45	1	4	3	12.6
Alta Seeds	*XG30002*	104.3	—	—	38	1	4	3	13.8
Sorghum Partners	SP7715	102.7	—	—	53	1	9	3	11.7
Alta Seeds	AG2103	102.6	—	—	40	1	4	3	11.9
Dyna-Gro	M77GB52	102.1	—	—	50	1	5	4	11.7
Alta Seeds	*XG30003*	99.0	—	—	37	1	8	3	13.1
Alta Seeds	AG3101	98.6	—	—	51	1	7	1	12.9
Alta Seeds	*XG30001*	96.6	—	—	47	1	7	2	12.8
Dyna-Gro	765B	96.2	—	—	48	1	7	2	13.5
Pioneer	84P80	94.7	—	—	45	1	7	1	12.1
Sorghum Partners	*SPX17414*	92.2	—	—	44	1	3	1	11.3
AgVenture	AvX3346	84.7	—	—	44	1	4	3	10.8
Mean		108.5							
LSD		11.9							
Error df		90							
CV		9.3							
R^2		59.7							

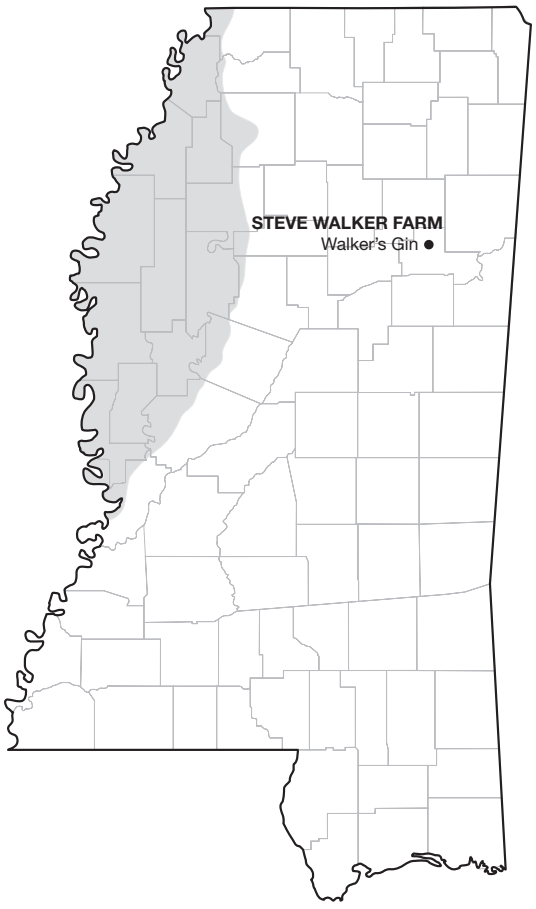
[1]Hybrid in italics denotes an experimental entry.
[2]No 2- or 3-year averages.

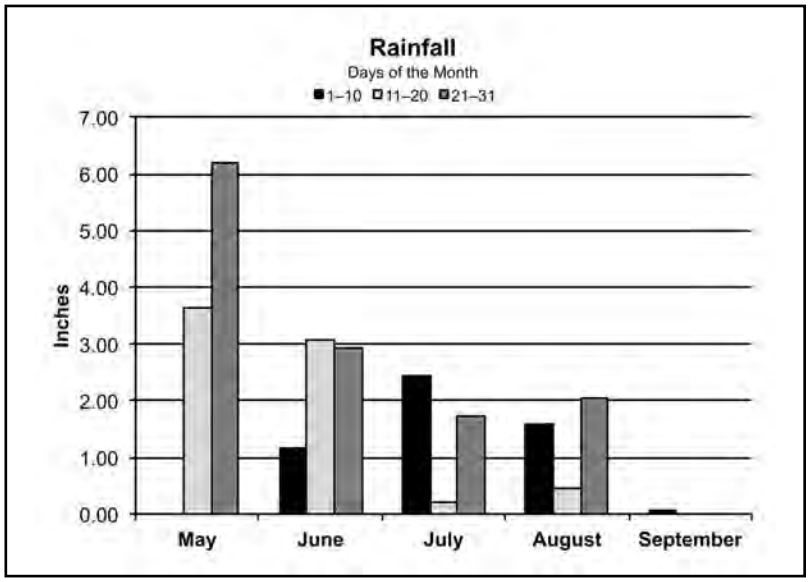
STEVE WALKER FARM, WALKER'S GIN

Crop Summary

Sorghum plots were planted into a stale seedbed with adequate moisture for germination. Plots quickly emerged to a good stand. Timely rains allowed for good growing conditions throughout the season. Insect pressure was very light. Very good yields were observed from this location.

Planting date: . . . . . .May 6
Harvest date: . . . . . .September 1
Soil type: . . . . . .Mathiston silt loam
Soil pH: 5.8
Soil fertility: . . . . . .P= M, K= M
Fertilizer added: . . . . . .9-24-30 @ 200 lb/A and Urea @ 200 lb/A on June 6
Herbicide applied: . . . . . .Preemergence — Lexar @ 3 qt/A on May 6
Postemergence — Atrazine @ 1 qt/A and Dual @ 1 pt/A on June 11
Insecticide applied: . . . .Sivanto @ 4 oz/A on July 21
Previous crop: . . . . . .Soybean





Rainfall Summary

	Inches
May	9.84
June	7.17
July	4.39
August	4.08
September	0.06
Total	25.54

Table 5. Performance for 31 hybrids grown without irrigation at Steve Walker Farm, Walker's Gin, 2015.

Brand	Hybrid[1]	2015 yield	2-year average	3-year average	Plant height	Lodging score	Head exertion	Head compactness	Moisture content
		bu/A	*bu/A*	*bu/A*	*in*	*(1-5)*	*in*	*(1-5)*	*%*
Pioneer	83P99	171.6	129.5	126.8	48	1	3	2	13.2
Pioneer	83P17	170.4	139.5	125.9	51	1	2	2	13.9
AgVenture	AvX3340	163.9	—	—	54	1	3	3	12.6
Dyna-Gro	765B	160.8	121.8	118.9	55	1	2	2	14.5
Pioneer	84P80	156.8	123.9	124.8	53	1	4	2	12.8
Sorghum Partners	SP7715	156.7	—	—	53	1	4	2	13.7
Sorghum Partners	NK6638	155.2	118.9	—	53	1	6	3	12.6
AgVenture	AvX3344	155.0	—	—	53	1	5	2	14.6
Alta Seeds	AG1203	153.8	—	—	55	1	3	3	13.0
Alta Seeds	AG2105	152.7	—	—	56	1	4	3	13.2
Sorghum Partners	SP7868	151.8	118.4	—	51	1	3	1	13.5
Sorghum Partners	*SPX17414*	149.0	—	—	52	1	4	2	13.3
AgVenture	AvX3346	148.9	—	—	56	1	4	2	12.3
Terral Seed	REV 9924	148.5	119.4	116.8	53	1	3	2	12.4
Mycogen	1G855C	147.9	—	—	55	1	2	2	14.3
Alta Seeds	*XG30002*	144.8	—	—	50	1	4	3	14.9
Alta Seeds	AG3201	142.9	—	—	53	1	2	2	12.8
Alta Seeds	*XG30003*	140.7	—	—	43	1	4	2	16.7
Alta Seeds	*XG30001*	139.1	—	—	47	1	3	4	13.9
Dyna-Gro	*GX13231*	138.0	112.9	—	50	1	3	3	13.3
Dyna-Gro	M77GR61	137.5	112.3	109.9	53	1	2	3	13.6
Dyna-Gro	M77GB52	137.0	112.4	112.8	54	1	5	3	13.1
Terral Seed	REV 9782	134.8	116.1	115.1	53	1	5	2	13.5
Sorghum Partners	*SPX17114*	134.7	—	—	49	1	3	2	11.8
Alta Seeds	AG3101	134.6	—	—	47	1	8	2	13.2
Sorghum Partners	*SPX17514*	128.5	—	—	56	1	2	2	13.9
Alta Seeds	*XG02008*	122.3	—	—	50	1	3	2	13.1
Terral Seed	REV 9562	119.8	100.9	105.2	51	1	4	3	12.9
Alta Seeds	AG2103	115.9	—	—	47	1	2	4	13.0
Alta Seeds	AG2115	111.1	—	—	51	1	3	3	12.5
AgVenture	AvX3934	95.9	—	—	49	1	3	4	11.8
Mean		142.6							
LSD		16.1							
Error df		90							
CV		9.5							
R^2		69.6							

[1]Hybrid in italics denotes an experimental entry.

NOTICE TO USER

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.

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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.

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