MISSISSIPPI GRAIN SORGHUM

HYBRID TRIALS, 2022

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

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NOTE 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.

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, 2022

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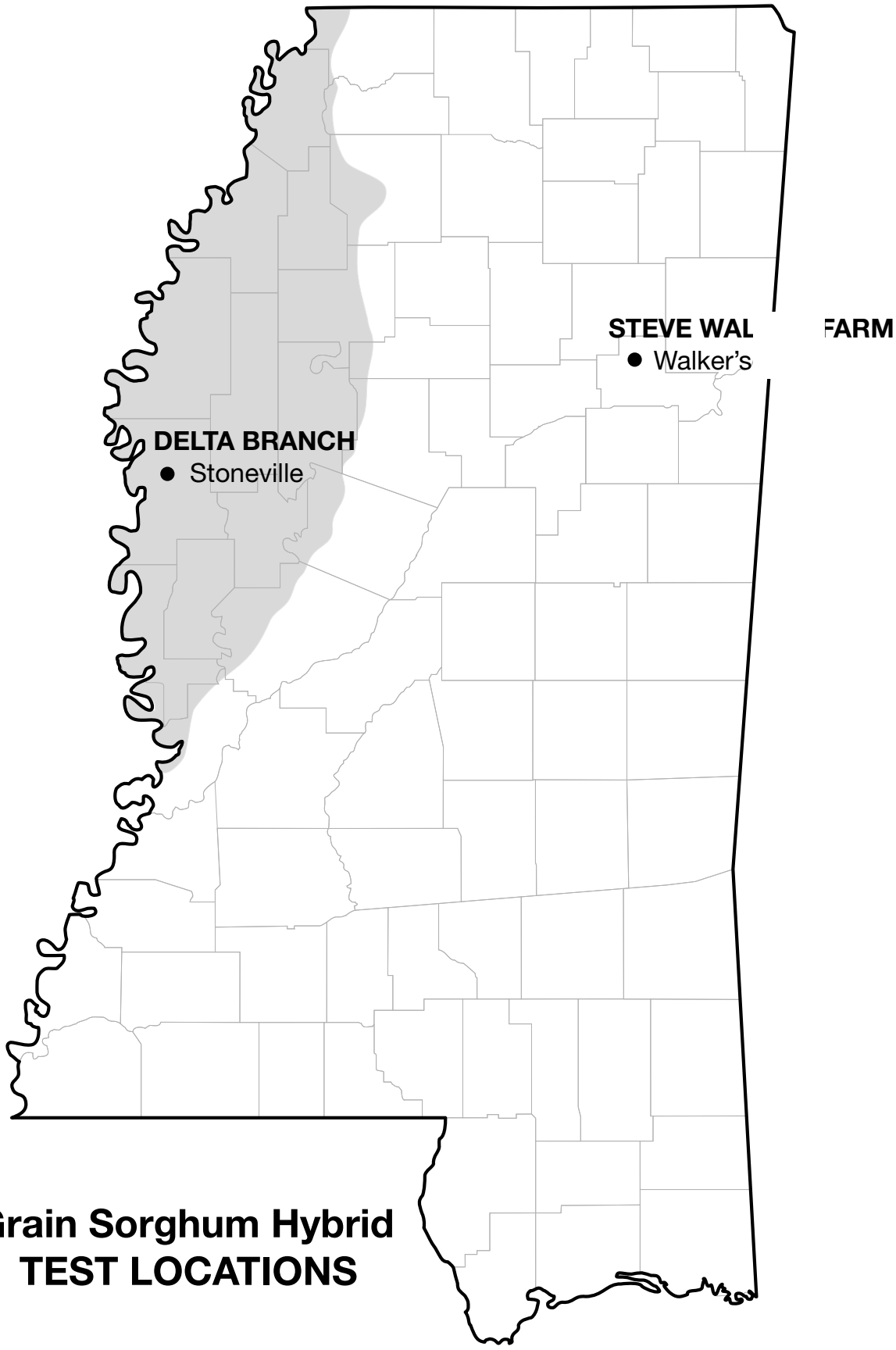
Our website address is ***mafes.msstate.edu/variety-trials***.



Grain Sorghum Hybrid
TEST LOCATIONS

Mississippi Grain Sorghum Hybrid Trials, 2022

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. 2022 grain sorghum hybrid trial location summary.

Location	Irrigation	Soil type	Planting date	Harvest date	Row spacing
Stoneville, Delta Branch	Irrigated	Bosket very fine sandy loam	5/11	9/20	40”
Walker’s Gin, Steve Walker Farm	Not Irrigated	Mathiston silt loam	5/10	9/14	38”

Table 2. Hybrids entered in the Mississippi grain sorghum hybrid trials, 2022.

Brand	Hybrid[1]	Seed treatment	Plant population (x1000)	Days to maturity
Dekalb	DKC50-07	Concep/Poncho	90K	112
Dekalb	DKC51-01	Concep/Poncho	90K	114
Dekalb	DKS45-60	Concep/Poncho	90K	110
Dekalb	DKS54-07	Concep/Poncho	90K	116
Dyna-Gro	GX22932 *	—	90K	105
Dyna-Gro	M60GB31	—	90K	98
Dyna-Gro	M63GB78	—	90K	98
Dyna-Gro	M67GB87	—	90K	102
Dyna-Gro	M71GR91	—	90K	106
Dyna-Gro	M72GB71	—	90K	106

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

Table 3. 2022 yield summary of grain sorghum hybrid trials in Mississippi.

Brand	Hybrid	Stoneville Delta (loam)	Walker's Gin Hills (loam)	Overall avg.
		bu/A	*bu/A*	*bu/A*
Dekalb	DKS45-60	107.8	83.0	95.4
Dekalb	DKS50-07	109.3	88.6	98.9
Dekalb	DKC51-01	110.5	75.7	93.1
Dekalb	DKS54-07	113.4	95.2	104.3
Dyna-Gro	M60GB31	93.9	72.8	83.4
Dyna-Gro	M63GB78	90.8	30.9	60.9
Dyna-Gro	M67GB87	110.7	75.7	93.2
Dyna-Gro	M71GR91	106.9	73.3	90.1
Dyna-Gro	M72GB71	114.0	87.9	100.9
Dyna-Gro	GX22932 *	100.6	84.2	92.4
Mean		105.6	76.0	90.8
CV		14.3	19.3	
R^2		25.2	63.0	
LSD(0.05)		NS	21.4	
Error df		30	30	

[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 (loam)	Walker's Gin Hills (loam)	Overall avg.
		bu/A	*bu/A*	*bu/A*
Dekalb	DKC51-01	121.3	82.6	101.9
Dekalb	DKS45-60	119.1	87.3	103.2
Dekalb	DKS50-07	125.3	91.8	108.6
Dekalb	DKS54-07	113.0	92.8	102.9
Dyna-Gro	M60GB31	97.4	78.3	87.8
Dyna-Gro	M71GR91	113.4	84.1	98.7
Dyna-Gro	M72GB71	111.4	89.0	100.2
Mean		114.4	86.6	100.5

Table 5. Three-year average of grain sorghum hybrid trials in Mississippi.

Brand	Hybrid	Stoneville Delta (loam)	Walker's Gin Hills (loam)	Overall avg.
		bu/A	*bu/A*	*bu/A*
Dekalb	DKC51-01	121.8	92.0	106.9
Dekalb	DKS54-07	116.0	91.1	103.6
Dyna-Gro	M60GB31	102.7	79.1	90.9
Dyna-Gro	M71GR91	109.1	87.2	98.2
Dyna-Gro	M72GB71	114.1	93.1	103.6
Mean		112.8	88.5	100.6

Table 6. 2022 grain sorghum plant height, head exertion, and head compactness.

Brand	Hybrid	Stoneville			Walker's Gin		
		Plant height	Head exertion	Head compactness	Plant height	Head exertion	Head compactness
Dekalb	DKS45-60	58	7	4	54	6	1
Dekalb	DKS50-07	62	4	1	56	3	1
Dekalb	DKC51-01	60	2	3	58	8	2
Dekalb	DKS54-07	62	5	5	55	4	1
Dyna-Gro	M60GB31	61	5	3	57	7	2
Dyna-Gro	M63GB78	51	6	5	48	7	3
Dyna-Gro	M67GB87	58	2	2	55	7	1
Dyna-Gro	M71GR91	54	3	3	61	6	1
Dyna-Gro	M72GB71	57	3	5	58	4	1
Dyna-Gro	GX22932 *	53	4	5	57	6	1

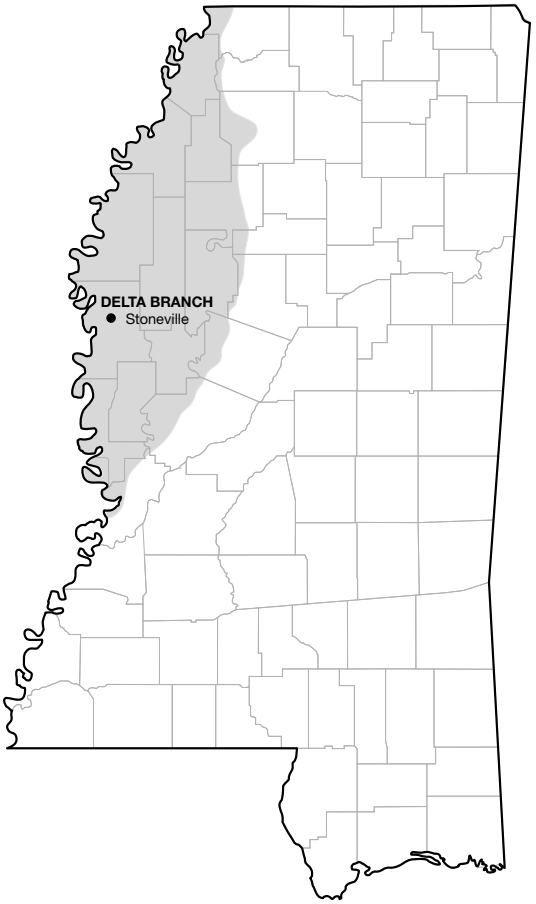
[1]Hybrid followed by an asterisk indicates an experimental entry.

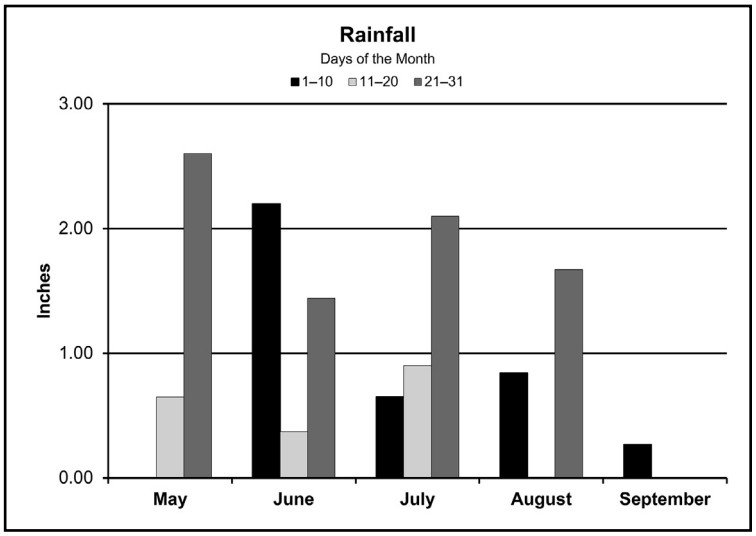
MAFES DELTA BRANCH, STONEVILLE

Crop Summary

All plots were planted in early May into a field that had the rows do-alled just prior to planting. Conditions at planting were very favorable for germination and emergence. All plots quickly emerged to a good stand. Temperatures were high and rainfall events were scarce during the summer; however, furrow irrigation allowed for ample soil moisture throughout the growing season. This location was desiccated prior to harvest to allow for ease of harvest. Harvest was completed approximately 14 days after desiccating the plots. Weather was very favorable during harvest, and all plots were harvested without difficulties.

Planting date . . . .May 11
Harvest date . . . .September 20
Soil type . . . . . .Bosket very fine sandy loam
Soil pH 6.5
Soil fertility . . . . .P=H; K=H
Previous crop . . .Grain Sorghum
Fertilizer . . . . . .Sidedress — 160 units of N (32% UAN) on June 1
Herbicides . . . . . .Preemergence — Dual II Magnum @ 24 oz/A on May 11
Postemergence — Atrazine @ 32 oz/A and Dual II Magnum @ 16 oz/A on June 1
Insecticides . . . . .Mustang MAX @ 5 oz/A on July 8; Mustang MAX @ 4 oz/A and Transform @ 1.5 oz/A on July 18





Rainfall Summary

	Inches
May	3.25
June	4.01
July	3.65
August	2.52
September	0.27
Total	13.70

Table 7. Performance results of 10 hybrids grown at MAFES Delta Branch, Stoneville, 2022.

Brand	Hybrid	2022 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	M72GB71	114.0	111.4	114.1	57	3	5
Dekalb	DKS54-07	113.4	113.0	116.0	62	5	5
Dyna-Gro	M67GB87	110.7	—	—	58	2	2
Dekalb	DKC51-01	110.5	121.3	121.8	60	2	3
Dekalb	DKS50-07	109.3	125.3	—	62	4	1
Dekalb	DKS45-60	107.8	119.1	—	58	7	4
Dyna-Gro	M71GR91	106.9	113.4	109.1	54	3	3
Dyna-Gro	GX22932 *	100.6	—	—	53	4	5
Dyna-Gro	M60GB31	93.9	97.4	102.7	61	5	3
Dyna-Gro	M63GB78	90.8	—	—	51	6	5
Mean		105.8					
CV		14.3					
R^2		25.2					
LSD(0.05)		NS					
Error df		30					

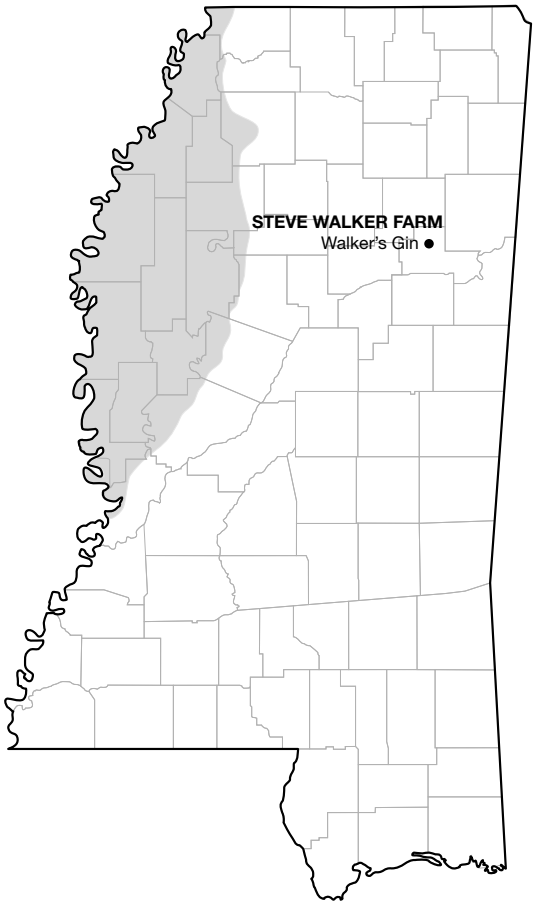
[1]Hybrid followed by an asterisk indicates an experimental entry.

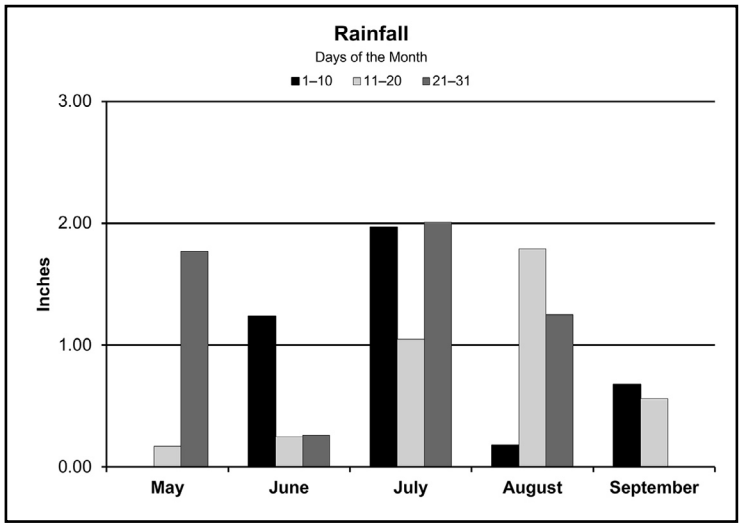
STEVE WALKER FARM, WALKER'S GIN

Crop Summary

All plots were planted in early May into a field that had previously been plant with soybeans. The rows were do-alled just prior to planting. Conditions at planting were very favorable for germination and emergence. All plots quickly emerged to a good stand. The plots were subjected to high temperatures and very limited rainfall during the growing season. This location was desiccated prior to harvest to allow for ease of harvest. Harvest was completed approximately 14 days after desiccating the plots. Weather was very favorable during harvest and all plots were harvested without difficulties.

Planting date . . .May 10
Harvest date . . . .September 14
Soil type . . . . . .Mathiston silt loam
Soil pH 5.9
Soil fertility . . . . .P=M; K=M
Previous crop . . .Soybean
Fertilizer . . . . . .Topdress — 9-23-30 @ 200 lb/A and 69 units of N (46-0-0); 33 units of N (33-0-0-12S)
Herbicides . . . . . .Preemergence — Lexar @ 2 qt/A and Gramoxone @ 32 oz/A on May 10
Postemergence — Atrazine @ 32 oz/A, Huskie @ 16 oz/A, and Metolachlor @ 16 oz/A
Insecticides . . . . .Sivanto @ 6.4 oz/A, Prevathon @ 20 oz/A, and lambda cyhalothrin @ 2.5 oz/A on July 8





Rainfall Summary

	Inches
May	1.94
June	1.75
July	5.03
August	3.22
September	1.24
Total	13.18

Table 8. Performance results of 10 hybrids grown at Steve Walker Farm, Walker's Gin, 2022.

Brand	Hybrid[1]	2022 yield	2-year average	3-year average	Plant height	Head exertion	Head compactness
		bu/A	*bu/A*	*bu/A*	*in*	*in*	*(1-5)*
Dekalb	DKS54-07	95.2	92.8	91.1	55	4	1
Dekalb	DKS50-07	88.6	91.8	—	56	3	1
Dyna-Gro	M72GB71	87.9	89.0	93.1	58	4	1
Dyna-Gro	GX22932 *	84.2	—	—	57	6	1
Dekalb	DKS45-60	83.0	87.3	—	54	6	1
Dyna-Gro	M67GB87	75.7	—	—	55	7	1
Dekalb	DKC51-01	75.7	82.6	92.0	58	8	2
Dyna-Gro	M71GR91	73.3	84.1	87.2	61	6	1
Dyna-Gro	M60GB31	72.8	78.3	79.1	57	7	2
Dyna-Gro	M63GB78	30.9	—	—	48	7	3
Mean		76.7					
CV		19.3					
R^2		63.0					
LSD(0.05)		21.4					
Error df		30					

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

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MS AGRICULTURAL AND FORESTRY EXPERIMENT STATION

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