



University of Tennessee, Knoxville
**TRACE: Tennessee Research and Creative
Exchange**

Field & Commercial Crops

UT Extension Publications

1-2009

SP639-2008-2008 Grain Sorghum Hybrid Tests in Tennessee

The University of Tennessee Agricultural Extension Service

Follow this and additional works at: https://trace.tennessee.edu/utk_agexcrop



Part of the [Agronomy and Crop Sciences Commons](#)

Recommended Citation

"SP639-2008-2008 Grain Sorghum Hybrid Tests in Tennessee," The University of Tennessee Agricultural Extension Service, SP639-200-1/09 E12-5201-001-020-09 09-0158, https://trace.tennessee.edu/utk_agexcrop/15

The publications in this collection represent the historical publishing record of the UT Agricultural Experiment Station and do not necessarily reflect current scientific knowledge or recommendations. Current information about UT Ag Research can be found at the [UT Ag Research website](#).

This Crop Performance is brought to you for free and open access by the UT Extension Publications at TRACE: Tennessee Research and Creative Exchange. It has been accepted for inclusion in Field & Commercial Crops by an authorized administrator of TRACE: Tennessee Research and Creative Exchange. For more information, please contact trace@utk.edu.

Grain Sorghum Hybrid Tests in Tennessee 2009

Fred L. Allen,
Coordinator,
Agronomic Crop Variety
Testing & Demonstrations

Richard Johnson,
Research Associate,
Agronomic Crop Variety
Testing & Demonstrations

**Agronomic Crop Variety Testing
& Demonstrations**
Department of Plant Sciences
Institute of Agriculture,
University of Tennessee Knoxville

Telephone (865) 974-8821
Fax (865) 974-1947
Email allenf@utk.edu

Variety test results are posted
on UT's Web site at
<http://varietytrials.tennessee.edu>
and www.utcrops.com

Acknowledgments

This research was funded by the Tennessee Agricultural Experiment Station and UT Extension with partial funding from participating companies.

We gratefully acknowledge the assistance of the following individuals in conducting these experiments:

Dept. of Plant Sciences

Kara Warwick, Graduate Research Assistant

Jennifer Lane, Graduate Research Assistant

Research and Education Centers:

East Tennessee, Knoxville

Dr. John Hodges, Center Director

Mr. Bobby McKee, Sr. Farm Crew Leader

Mr. Lee Ellis, Research Assistant

Highland Rim, Springfield

Dr. Barry Sims, Center Director

Mr. Brad Fisher, Research Associate

Milan

Dr. Blake Brown, Center Director

Mr. Jason Williams, Research Associate

Mr. James McClure, Research Associate

Ames Plantation

Rick Carlisle, Center Director

Marshall Smith, Research Associate

Jamie Evans, Research Associate

Table of Contents

Experimental Procedures _____	3
Interpretation of Data _____	3
Research and Education Center Information _____	3
Research and Education Center Tests _____	4
Hybrid Characteristics _____	7
Seed Company Contact Information _____	7

2009 PERFORMANCE OF GRAIN SORGHUM HYBRIDS IN TENNESSEE RESEARCH AND EDUCATION CENTERS

Experimental Procedures:

The grain sorghum variety trial was conducted in each of the physiographic regions of the state. The trial was conducted at the East Tennessee (Knoxville); Highland Rim (Springfield); Milan (Milan) and Ames Plantation (Grand Junction) Research and Education Centers (REC). The trial contained eight hybrids at each location. The tests were fertilized with 90 pounds of nitrogen per acre. A portion of the nitrogen was applied prior to seeding and the remainder was applied as a side-dress. The plot size was two rows, 30 feet in length with 30-inch row spacing. Plots were replicated three times at each location in a randomized complete block design. Plots were seeded at the rate of approximately 87,600 seed per acre (approx. 7 lbs/a). Table 1 contains the test location information on planting and harvest dates and soil types. Tables 2 and 3 contain the **Research and Education Center Test** data for 2009. Tables 4 and 5 contain the two-year data; Tables 6 and 7 contain the three-year data. Table 8 contains the phenotypic trait data for the grain sorghum hybrids tested in 2009. The contact information for sorghum seed companies is listed in Table 9.

Interpretation of Data:

The tables on the following pages have been prepared with the entries listed in order of performance, the highest-yielding entry being listed first. **All yields presented have been adjusted to 14% moisture.** At the bottom of the tables, **LSD** values stand for **Least Significant Difference**. The mean yields of any two varieties being compared must differ by at least the amount shown in order to be considered different in yielding ability at the 5% level of probability of significance. For example, given that the LSD for a test is 850 lbs/a and the mean yield of Hybrid A was 4200 lbs/a and the mean yield of Hybrid B was 5000 lbs/a, then the two hybrids are not statistically different in yield because the difference of 800 lbs/a is less than the minimum of 850 lbs/a required for them to be significant. Similarly, if the average yield of Hybrid C was 5900 lbs/a then it is significantly higher yielding than both Hybrid B and Hybrid A, because the difference between B and C (900 lbs) and the difference between A and C (1700 lbs) exceeds the LSD value of 850 lbs.

Also, the **coefficient of variation (C.V.)** values are shown at the bottom of each table. This value is a measure of the error variability found within each experiment. It is the percentage that the square root of error mean square is of the overall test mean yield at that location. For example, a C.V. of 10% indicates that the size of the error variation is about 10% of the size of the test mean. Similarly, a C.V. of 30% indicates that the size of the error variation is nearly one-third as large as the test mean. A goal in conducting each yield test is to keep the C.V. as low as possible, preferably below 20%.

Growing Season: The 2009 growing season was characterized by cooler and wetter than normal conditions overall. Wet and relatively warm conditions in September through November delayed harvest and in some cases resulted in grain that was moldy and sprouted prior to harvest.

Table 1. Location information from Research and Education Centers where the grain sorghum hybrid tests were conducted in 2009.

Research & Education Center	Location	Planting Date	Harvest Date	Seeding	
				Rate	Soil Type
East Tennessee	Knoxville	May 14, 2009	October 6, 2009	87,600	Stasser Silt Loam
Highland Rim	Springfield	May 20, 2009	October 22, 2009	87,600	Hamblen Silt Loam
Milan	Milan	May 19, 2009	October 8, 2009	87,600	Memphis, Loring Silt Loam
Ames	Grand Junction	April 28, 2009	September 30, 2009	87,600	Lexington Silt Loam

Table 2. Mean yields of eight grain sorghum hybrids evaluated in four environments in Tennessee during 2009.

Brand	Hybrid	Avg. Yield†		Spring	
		(n=4)	(n=4)	Hill	Ames
		----- lbs/a -----			
DeKalb	DKS54-00	143 ± 3	7866 ± 189	10646	9942
Pioneer	84G62	139 ± 4	7664 ± 202	10283	8976
DeKalb	DKS44-20	136 ± 3	7456 ± 189	10438	9346
DeKalb	DKS54-03	135 ± 3	7410 ± 189	9891	9869
Sorghum Partners	NK 7829	133 ± 3	7340 ± 189	10355	8348
DeKalb	DKS53-67	131 ± 3	7215 ± 189	9421	8914
Asgrow	A571	128 ± 3	7034 ± 189	9994	8290
Sorghum Partners	NK 6638	123 ± 3	6748 ± 189	9411	7654
Avg. (lbs/a)		133	7324	10054	8913
L.S.D..05 (lbs/a)		10	538	947	1232
C.V. (%)		8.9	8.9	5.4	7.6

† All yields adjusted to 14%; lbs / ac + 55 = bushels per acre

‡ Due to extensive bird damage on this entry, missing plot value was calculated at this location.

Table 3. Overall mean yields and agronomic characteristics of eight grain sorghum hybrids evaluated in four environments in Tennessee during 2009.

Brand	Hybrid	Avg. Yield		Moisture at Harvest (n=4)	Test Weight (n=1)	Pollen Shed (n=1)	Height (n=3)	Lodging‡ (n=2)	Bird Damages (n=2)	Head Type ¶ (n=2)	Grain Mold † (n=1)	Sprouting * (n=2)
		(n=4)	(n=4)									
		bu/a	lbs/ bu	%	lbs/bu	DAP	in.	score	score	score	score	score
DeKalb	DKS54-00	143 ± 3	53.7	16.2	53.7	74	59	1.0	1.2	2.8	2.8	3.4
Pioneer	84G62	139 ± 4	56.5	15.9	56.5	74	52	1.0	1.1	3.8	2.0	2.3
DeKalb	DKS44-20	136 ± 3	54.9	16.1	54.9	74	56	1.0	1.1	3.1	2.5	3.1
DeKalb	DKS54-03	135 ± 3	53.3	16.5	53.3	76	57	1.0	1.1	3.6	2.5	3.2
Sorghum Partners	NK 7829	133 ± 3	55.0	17.2	55.0	76	57	1.0	1.1	1.9	2.3	2.5
DeKalb	DKS53-67	131 ± 3	56.7	16.3	56.7	76	55	1.0	1.1	2.3	2.2	2.8
Asgrow	A571	128 ± 3	51.8	15.7	51.8	75	56	1.0	1.1	3.0	2.8	2.6
Sorghum Partners	NK 6638	123 ± 3	50.6	15.7	50.6	74	55	1.0	1.1	3.3	2.5	3.8
Average		133	54.1	16.2	54.1	75	56	1.0	1.1	3.0	2.5	2.9

Bushel weight of No. 2 sorghum equals 55 lbs.

DAP = days after planting

† Grain Mold = 1 to 5 scale; where 1 = 95+% of grain has no mold; 5 = 95+% of grain or moldy.

‡ Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

§ Bird damage = 1 to 5 scale; where 1 = no bird feeding; 5 = 95+% of grain removed by birds.

¶ Head Type - 1 to 5 scale; where 1 = compact head; 5 = open head.

* Sprouting = 1 to 5 scale; where 1 = 95+% of grain has no sprouting; 5 = 95+% of grain has sprouted.

Table 4. Mean yields of six grain sorghum hybrids evaluated in three environments for two years (2008-2009) in Tennessee.

Brand	Hybrid	Avg. Yield†		Avg. Yield‡		Milan
		± Std. Err. (n=6)	(n=6)	± Std. Err. (n=6)	(n=6)	
		bu/a	lbs/a	bu/a	lbs/a	
DeKalb	DKS54-00	140 ± 3	7691 ± 170	9384	5458	8231
Pioneer	84G62	138 ± 4	7588 ± 197	9357	5775	7630
DeKalb	DKS44-20	135 ± 3	7438 ± 163	9246	5221	7847
DeKalb	DKS53-67	133 ± 3	7336 ± 163	8743	5468	7798
DeKalb	DKS54-03	133 ± 3	7302 ± 163	8860	5107	7939
Asgrow	A571	131 ± 3	7227 ± 163	9208	5557	6916
Avg. (lbs/a)		135	7430	9133	5431	7727
L.S.D..05 (lbs/a)		11	608	1587	831	949
C.V. (%)		9.9	9.9	10.0	10.7	8.8

† All yields adjusted to 14%; lbs / ac ÷ 55 = bushels per acre

Table 5. Overall mean yields and agronomic characteristics of six grain sorghum hybrids evaluated in three environments for two years (2008-2009) in Tennessee.

Brand	Hybrid	Avg. Yield		Moisture		Test		Pollen		Head		Bird	
		± Std. Err. (n=6)	(n=6)	at Harvest (n=6)	%	Weight (n=2)	(n=2)	Shed (n=1)	Blast† (n=2)	Height (n=6)	Lodging‡ (n=4)	Damages§ (n=4)	Headtype¶ (n=3)
		bu/a	bu/a	lbs/bu	DAP	score	in.	score	score	score	score	score	
DeKalb	DKS54-00	140 ± 3	16.9	55.8	73	1.0	58	1.0	1.7	2.8			
Pioneer	84G62	138 ± 4	16.6	57.8	72	1.0	51	1.0	1.6	3.2			
DeKalb	DKS44-20	135 ± 3	16.6	56.7	71	1.0	54	1.0	1.5	3.3			
DeKalb	DKS53-67	133 ± 3	16.9	58.5	73	1.0	54	1.0	1.6	2.8			
DeKalb	DKS54-03	133 ± 3	16.9	55.6	74	1.0	56	1.0	1.5	3.2			
Asgrow	A571	131 ± 3	16.3	54.1	72	1.0	54	1.0	1.4	3.2			
Average		135	16.7	56.4	72	1.0	55	1.0	1.5	3.1			

Bushel weight of No. 2 sorghum equals 55 lbs.

† Head blast = 1 to 5 scale; where 1 = 95+% of florets on the head are filled with grain and no mold; 5 = 95+% of florets unfilled with grain or moldy or both.

‡ Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

§ Bird damage = 1 to 5 scale; where 1 = no bird feeding; 5 = 95+% of grain removed by birds.

¶ Head type = 1 to 5 scale; where 1 = compact head; 5 = open head.

Table 6. Mean yields of four grain sorghum hybrids evaluated in three environments for three years (2007-2009) in Tennessee.

Brand	Hybrid	Avg. Yield†		Avg. Yield†		Knoxville	Springfield	Milan
		± Std. Err. (n=9)	bu/ac	± Std. Err. (n=9)	lbs/a			
Pioneer	84G62	123 ± 3	6770 ± 165	8305	4915	7089		
DeKalb	DKS54-00	122 ± 3	6715 ± 148	8032	4498	7616		
Dekalb	DKS53-67	121 ± 3	6667 ± 144	7813	4850	7339		
Asgrow	A571	117 ± 3	6420 ± 144	8057	4625	6576		
Avg. (lbs/a)		121	6643	8052	4722	7155		
L.S.D..05 (lbs/a)		11	613	1447	670	1084		
C.V. (%)		12.2	12.2	12.6	11.1	11.4		

† All yields adjusted to 14%; lbs / ac ÷ 55 = bushels per acre

Table 7. Overall mean yields and agronomic characteristics of four grain sorghum hybrids evaluated in three environments for three years (2007-2009) in Tennessee.

Brand	Hybrid	Avg. Yield		Moisture at Harvest (n=9)	Test Weight (n=5)	Head Blast† (n=4)	Height (n=9)	Lodging‡ (n=5)	Bird Damages§ (n=7)	Headtype¶ (n=4)
		± Std. Err. (n=9)	bu/a							
Pioneer	84G62	123 ± 3	6770	15.4	57.7	1.2	50	1.0	1.6	2.7
DeKalb	DKS54-00	122 ± 3	6715	15.7	55.8	1.2	55	1.0	1.7	2.7
Dekalb	DKS53-67	121 ± 3	6667	15.8	58.4	1.1	52	1.0	1.6	3.3
Asgrow	A571	117 ± 3	6420	15.3	55.2	1.2	52	1.0	1.5	3.5
Average		121	6643	15.6	56.8	1.2	52	1.0	1.6	3.0

Bushel weight of No. 2 sorghum equals 55 lbs.

† Head blast = 1 to 5 scale; where 1 = 95+% of florets on the head are filled with grain and no mold; 5 = 95+% of florets unfilled with grain or moldy or both.

‡ Lodging = 1 to 5 scale; where 1 = 95% of plants erect; 2.5 = ~50% of plants leaning at an angle ≥ 45°; 5 = 95+% of plants leaning at an angle ≥ 45°.

§ Bird damage = 1 to 5 scale; where 1 = no bird feeding; 5 = 95+% of grain removed by birds.

¶ Head type = 1 to 5 scale; where 1 = compact head; 5 = open head.

Table 8. Characteristics of grain sorghum hybrids evaluated in yield tests in Tennessee during 2009 provided by participating seed companies.

Brand	Hybrid	Grain			Head Type	Green Bug Resistance	Released or Experimental	Comments
		Color	Maturity	Resistance				
Asgrow	A571	Bronze	Med-Late	Open	---	R	---	
DeKalb	DKS44-20	Bronze	Med	---	---	R	---	
DeKalb	DKS53-67	Bronze	Med-Late	---	---	R	---	
DeKalb	DKS54-00	Bronze	110	Semi-Compact	C,E,I	R	For high yield environments, residue proven	
DeKalb	DKS54-03	Bronze	Med-Late	---	---	R	---	
Pioneer	84G62	Bronze	125	Open	---	R	---	
Sorghum Partners	NK 6638	Bronze	Med	---	---	R	Disease Resistance & Yield	
Sorghum Partners	NK 7829	Bronze	Med-Late	---	---	R	High Yield & Leaf Disease Resistance	

Table 9. Contact information for grain sorghum seed companies participating in yield tests in Tennessee during 2009.

Company	Contact	Phone	Email	Web site	Address
Monsanto (Asgrow, Dekalb)		800-335-2676		www.asgrowanddekalb.com	
Sorghum Partners	Jamie Perry	731-658-3931	jperry@midssouthcoop.com	www.sorghum-partners.com	14840 Hwy 18 S., P.O. Box 447 Bolivar, TN 38008
Pioneer Hi-Bred Int.	Michael Hughes	800-331-2475	michael.hughes@pioneer.com	www.pioneer.com	700 Boulevard South, Suite 302, Huntsville, AL 35802

Visit the UT Extension Web site at
<http://www.utextension.utk.edu/>

SP 639 12/09 10-0120 200 R12-5210-001-007-10

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development.
University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating.
UT Extension provides equal opportunities in programs and employment.