

# **Grain Sorghum Hybrid Tests in Tennessee**

## **2008**

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**<http://varietytrials.tennessee.edu/>  
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**Dr. Barry Sims**, Center Director  
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### County Standard Grain Sorghum Tests

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Dyer	Tim Campbell	Jay Johnson
Obion	Tim Smith	William & Bill Thompson
Gibson (Milan REC)	Dr. Angela Thompson McClure	Dr. Blake Brown

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## 2008 PERFORMANCE OF GRAIN SORGHUM HYBRIDS IN TENNESSEE RESEARCH AND EDUCATION CENTERS & COUNTY STANDARD TESTS

### 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); Middle Tennessee (Spring Hill); Highland Rim (Springfield); and Milan Research and Education Centers (REC). Because of random thin stands in some plots at Knoxville for the May planting, a second planting was made in June. Near harvest, bird damage was significant in some plots of the May planting at Knoxville. In cases of poor stands or severe bird damage at harvest, those plots were discarded and treated as missing values in the data analyses. The trial contained 14 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 2008. Tables 4 and 5 contain the two-year data, Tables 6 and 7 contain the three-year data. The **County Standard Test** data on nine hybrids from three counties are reported in Table 8. Table 9 contains the data on the grain sorghum hybrids that were common in the County Standard and REC tests. Table 10 contains the phenotypic trait data for the grain sorghum hybrids tested in 2008 and the contact information for sorghum seed companies is listed in Table 11.

### 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 2008 growing season was characterized by hot, dry conditions overall but somewhat improved compared to last year's record drought. Daytime temperatures were high (several 100+ F days) during flowering and seed fill periods at some locations. Widespread and scattered rainfall from remnants of Tropical Storm Fay in late August and Hurricane Ike in late September were beneficial to later plantings. The late rainfall gave way to dry weather during October allowing producers to finish harvest in a timely manner. Tennessee producers planted 26,000 acres of grain sorghum this year, an increase of 4,000 acres from planting in 2007.

**Table 1. Location information from Research and Education Centers where the grain sorghum hybrid tests were conducted in 2008.**

<b>Research &amp; Education Center</b>	<b>Location</b>	<b>Planting Date</b>	<b>Harvest Date</b>	<b>Seeding Rate</b>	<b>Soil Type</b>
East Tennessee	Knoxville	May 21, 2008	September 29, 2008	87,600	Sequatchie Silt Loam
East Tennessee (late planted)	Knoxville	June 17, 2008	November 6, 2008	87,600	Stasser Silt Loam
Middle Tennessee	Spring Hill	May 20, 2008	October 6, 2008	87,600	Maury Silt Loam
Highland Rim	Springfield	July 9, 2008	November 19, 2008	87,600	Sango Silt Loam
Milan	Milan	May 21, 2008	September 25, 2008	87,600	Loring, Grenada Silt Loam

**Table 2. Mean yields of 14 grain sorghum hybrids evaluated in five environments in Tennessee during 2008.**

Brand	Hybrid	Avg. Yield†	Avg. Yield†	(5/21 planted)	(6/17 planted)	Spring	Springfield	Milan
		± Std. Err. (n=5)	± Std. Err. (n=5)	Knoxville	Knoxville	Hill		
		bu/a	----- lbs/a-----					
Pioneer	84G62	106 ± 4	5815 ± 222	8431	5184	4416	4758	6285
Dyna-Gro	780B	104 ± 4	5737 ± 196	9821	4266	3727	4828	6046
FFR	x93-57	101 ± 4	5537 ± 195	9252	4414	3119	4863	6039
Asgrow	A571	101 ± 3	5528 ± 185	8421	4962	3921	4792	5541
Dekalb	DKS53-67	100 ± 3	5488 ± 185	8065	4947	3528	4218	6682
Dyna-Gro	751B	99 ± 4	5449 ± 222	8862	4432	2988	4980	5985
DeKalb	DKS54-00	98 ± 4	5415 ± 196	8121	4812	3456	4168	6519
DeKalb	DKS44-20	98 ± 3	5378 ± 185	8053	4772	3421	4292	6349
Dyna-Gro	772B	97 ± 4	5350 ± 196	8411	5245	3184	3967	5945
FFR	x93-50	97 ± 3	5332 ± 185	7713	4812	3527	5136	5471
DeKalb	DKS54-03	93 ± 3	5121 ± 185	7829	5231	3192	3345	6009
DeKalb	DKS37-07	91 ± 3	5009 ± 185	6901	4463	2842	4723	6117
Dyna-Gro	778B	89 ± 4	4907 ± 205	8035	3224	2960 ‡	3895	6419
FFR	x93-55	89 ± 4	4882 ± 196	7496	4188	3054	4133	5540
<b>Avg. (lbs/a)</b>		<b>97</b>	<b>5354</b>	<b>8244</b>	<b>4640</b>	<b>3413</b>	<b>4436</b>	<b>6068</b>
<b>L.S.D..05 (lbs/a)</b>		<b>10</b>	<b>534</b>	<b>2385</b>	<b>901</b>	<b>1366</b>	<b>903</b>	<b>1013</b>
<b>C.V. (%)</b>		<b>13.8</b>	<b>13.8</b>	<b>13.8</b>	<b>11.6</b>	<b>24.1</b>	<b>12.1</b>	<b>9.8</b>

† 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 14 grain sorghum hybrids evaluated in five environments in Tennessee during 2008.**

<b>Brand</b>	<b>Hybrid</b>	<b>Avg. Yield ± Std. Err. (n=5)</b>	<b>Moisture at Harvest (n=5)</b>	<b>Test Weight (n=2)</b>	<b>Pollen Shed (n=1)</b>	<b>Head Blast<sup>†</sup> (n=2)</b>	<b>Height (n=5)</b>	<b>Lodging<sup>‡</sup> (n=4)</b>	<b>Bird Damage<sup>§</sup> (n=4)</b>	<b>Head Type <sup>¶</sup> (n=1)</b>
		bu/a	%	lbs/bu	DAP	score	in.	score	score	score
Pioneer	84G62	106 ± 4	15.9	59.7	70	1.0	50	1.0	2.2	2.2
Dyna-Gro	780B	104 ± 4	16.5	60.1	73	1.0	56	1.0	2.1	4.5
FFR	x93-57	101 ± 4	16.8	58.3	71	1.0	56	1.0	2.0	2.3
Asgrow	A571	101 ± 3	15.9	57.7	70	1.0	52	1.0	1.9	3.5
Dekalb	DKS53-67	100 ± 3	16.2	60.5	70	1.0	52	1.0	2.1	3.8
Dyna-Gro	751B	99 ± 4	15.9	59.5	69	1.0	53	1.0	1.9	2.7
DeKalb	DKS54-00	98 ± 4	16.2	58.4	71	1.0	55	1.0	2.1	3.0
DeKalb	DKS44-20	98 ± 3	15.7	59.7	67	1.0	52	1.0	2.1	3.7
Dyna-Gro	772B	97 ± 4	16.0	59.1	70	1.0	52	1.0	2.3	2.2
FFR	x93-50	97 ± 3	17.4	57.8	70	1.0	53	1.0	2.1	2.2
DeKalb	DKS54-03	93 ± 3	16.0	59.0	72	1.0	54	1.0	1.9	2.5
DeKalb	DKS37-07	91 ± 3	15.1	60.0	66	1.0	51	1.0	2.1	1.8
Dyna-Gro	778B	89 ± 4	20.0	58.0	75	1.0	59	1.0	2.6	2.8
FFR	x93-55	89 ± 4	16.7	58.8	70	1.0	57	1.0	2.2	1.5
<b>Average</b>		<b>97</b>	<b>16.5</b>	<b>59.0</b>	<b>70</b>	<b>1.0</b>	<b>54</b>	<b>1.0</b>	<b>2.1</b>	<b>2.8</b>

Bushel weight of No. 2 sorghum equals 55 lbs.

DAP = days after planting

<sup>†</sup> 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 grain or moldy or both.

<sup>‡</sup> 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°.

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

<sup>¶</sup> Head Type - 1 to 5 scale; where 1 = compact head; 5 = open head.

**Table 4. Mean yields of eight grain sorghum hybrids evaluated in three environments for two years (2007-2008) in Tennessee.**

Brand	Hybrid	Avg. Yield†	Avg. Yield†	Knoxville	Springfield	Milan
		± Std. Err. (n=6)	± Std. Err. (n=6)			
		bu/a	-----	lbs/a-----		
Dekalb	DKS53-67	106 ± 3	5826 ± 185	7010	3916	6551
Pioneer	84G62	106 ± 4	5812 ± 216	7315	3976	6146
Dyna-Gro	780B	104 ± 4	5713 ± 193	7785	3406	5948
Dyna-Gro	751B	102 ± 4	5594 ± 223	7024	3420	6339
Asgrow	A571	101 ± 3	5529 ± 185	7089	3778	5720
DeKalb	DKS54-00	100 ± 4	5517 ± 193	6725	3372	6453
Dyna-Gro	772B	99 ± 4	5433 ± 193	7494	3492	5314
DeKalb	DKS37-07	97 ± 3	5347 ± 185	6389	3799	5852
<b>Avg. (lbs/a)</b>		<b>102</b>	<b>5596</b>	<b>7104</b>	<b>3645</b>	<b>6040</b>
<b>L.S.D..05 (lbs/a)</b>		<b>12</b>	<b>669</b>	<b>1689</b>	<b>644</b>	<b>1159</b>
<b>C.V. (%)</b>		<b>14.4</b>	<b>14.4</b>	<b>15.6</b>	<b>12.1</b>	<b>12.9</b>

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

**Table 5. Overall mean yields and agronomic characteristics of eight grain sorghum hybrids evaluated in three environments for two years (2007-2008) in Tennessee.**

Brand	Hybrid	Avg. Yield	Moisture	Test	Head	Height	Lodging‡	Bird	Headtype¶
		± Std. Err. (n=6)	at Harvest (n=6)	Weight (n=5)	Blast† (n=1)				
		bu/a	%	lbs/bu	score	in.	score	score	score
Dekalb	DKS53-67	106 ± 3	15.1	58.8	1.5	51	1.0	1.8	4.4
Pioneer	84G62	106 ± 4	14.8	58.0	1.7	48	1.0	1.9	1.6
Dyna-Gro	780B	104 ± 4	15.2	58.9	1.7	53	1.2	1.9	4.7
Dyna-Gro	751B	102 ± 4	14.9	58.2	1.7	50	1.2	1.7	2.4
Asgrow	A571	101 ± 3	14.8	56.1	1.7	50	1.0	1.6	3.9
DeKalb	DKS54-00	100 ± 4	15.0	56.2	1.7	53	1.0	2.0	2.6
Dyna-Gro	772B	99 ± 4	14.7	57.4	1.8	50	1.0	2.1	2.6
DeKalb	DKS37-07	97 ± 3	14.2	58.4	1.5	50	1.0	1.9	3.1
<b>Average</b>		<b>102</b>	<b>14.8</b>	<b>57.8</b>	<b>1.6</b>	<b>51</b>	<b>1.1</b>	<b>1.9</b>	<b>3.2</b>

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 six grain sorghum hybrids evaluated in three environments for three years (2006-2008) in Tennessee.**

Brand	Hybrid	Avg. Yield†	Avg. Yield†	Knoxville	Springfield	Milan
		± Std. Err. (n=9)	± Std. Err. (n=9)			
		bu/ac	----- lbs/a-----			
Pioneer	84G62	106 ± 3	5851 ± 152	7991	3545	6017
Dyna-Gro	780B	104 ± 3	5699 ± 141	8029	3276	5792
Dyna-Gro	751B	100 ± 3	5518 ± 156	7482	3193	5879
DeKalb	DKS37-07	100 ± 2	5502 ± 137	6814	3842	5850
DeKalb	DKS54-00	100 ± 3	5485 ± 141	7402	2922	6132
Asgrow	A571	99 ± 2	5461 ± 137	7445	3438	5501
<b>Avg. (lbs/a)</b>		<b>102</b>	<b>5586</b>	<b>7527</b>	<b>3369</b>	<b>5862</b>
<b>L.S.D..05 (lbs/a)</b>		<b>11</b>	<b>610</b>	<b>1349</b>	<b>854</b>	<b>1011</b>
<b>C.V. (%)</b>		<b>13.0</b>	<b>13.0</b>	<b>11.8</b>	<b>16.9</b>	<b>11.8</b>

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

**Table 7. Overall mean yields and agronomic characteristics of six grain sorghum hybrids evaluated in three environments for three years (2006-2008) in Tennessee.**

Brand	Hybrid	Avg. Yield	Moisture	Test	Head	Height	Lodging‡	Bird	Headtype¶
		± Std. Err. (n=9)	at Harvest (n=9)	Weight (n=8)	Blast† (n=1)			Damage§ (n=5)	
		bu/a	%	lbs/bu	score	in.	score	score	score
Pioneer	84G62	106 ± 3	14.7	57.9	1.7	49	1.0	1.9	2.0
Dyna-Gro	780B	104 ± 3	14.9	58.5	1.7	54	1.1	1.8	3.7
Dyna-Gro	751B	100 ± 3	14.6	57.4	1.7	51	1.1	1.7	2.7
DeKalb	DKS37-07	100 ± 2	14.1	58.0	1.5	50	1.0	1.8	2.5
DeKalb	DKS54-00	100 ± 3	14.7	55.8	1.7	53	1.0	1.9	3.0
Asgrow	A571	99 ± 2	14.6	55.9	1.7	50	1.0	1.6	2.9
<b>Average</b>		<b>102</b>	<b>14.6</b>	<b>57.2</b>	<b>1.6</b>	<b>51</b>	<b>1.0</b>	<b>1.8</b>	<b>2.8</b>

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. Yields of nine grain sorghum hybrids in three County Standard Tests in Tennessee during 2008.†‡**

MS	Hybrid	Avg.	Avg.	Moisture	Test	Dyer	Obion	Milan REC
		Yld	Yld		Weight			Gibson
		bu/a	lbs/a	%	lbs/bu	5/2 §	6/9	5/29
A	*****Pioneer 84G62	140.6	7733	13.5	60.0	142	146	134
AB	*Dekalb DKS53-67	137.7	7574	14.0	59.0	149	138	126
ABC	Dyna-Gro 751B	132.3	7277	13.8	58.5	143	136	118
ABC	FFR 322	131.7	7244	13.9	60.0	131	143	121
ABC	Dyna-Gro 772B	131.1	7211	13.8	59.0	135	135	123
ABC	Dekalb DKS54-03	130.3	7167	13.7	57.5	127	134	130
BC	****Pioneer 83G66	129.3	7112	14.4	59.5	137	140	110
C	FFR 318	125.6	6908	13.6	59.5	134	124	119
C	FFR 93-55	122.0	6710	13.8	59.5	132	127	107
<b>Average</b>		<b>131.2</b>	<b>7215</b>	<b>13.8</b>	<b>59.2</b>	<b>137</b>	<b>136</b>	<b>121</b>

Pounds per acre ÷ 55 = bushels per acre

MS = Hybrids that have any MS letter in common are not statistically different in yield at the 5% level of probability.

†Yields have been adjusted to 14% moisture. Each hybrid was evaluated in a large strip – plot at each location, thus each county test was considered as one replication of the test in calculating the average yield and in conducting the statistical analysis to determine significant differences (MS).

Test weight = average of two locations.

‡Data provided by Robert C. Williams, Ext. Area Specialist, Grain Crops, and extension agents in counties shown above.

§ Planting date.

\*Hybrids denoted with an asterisk (\*), (\*\*\*\*), or (\*\*\*\*\*) were in the top performing group in 2007, 2007-2004, or 2007-2001 respectively.

**Table 9. Overall average yields, moistures, and test weights of six grain sorghum hybrids evaluated in county standard tests and Research and Education Center tests in Tennessee during 2008.†**

Brand	Hybrid	County Standard Tests			Experiment Station Tests		
		Avg. Yield (n=3)	Moisture (n=3)	Test Weight (n=3)	Avg. Yield (n=5)	Moisture (n=5)	Test Weight (n=5)
		bu/a	%	lbs/bu	bu/a	%	lbs/bu
Pioneer	84G62	141	13.5	60.0	106	15.9	59.7
Dekalb	DKS53-67	138	14.0	59.0	100	16.2	60.5
Dyna-Gro	751B	132	13.8	58.5	99	15.9	59.5
Dyna-Gro	772B	131	13.8	59.0	97	16.0	59.1
DeKalb	DKS54-03	130	13.7	57.5	93	16.0	59.0
FFR	x93-55	122	13.8	59.5	89	16.7	58.8
<b>Average (lbs/a)</b>		<b>132</b>	<b>13.8</b>	<b>58.9</b>	<b>97</b>	<b>16.1</b>	<b>59.4</b>

† All yields adjusted to 14%, bushel weight of No. 2 sorghum equals 55 lbs.

**Table 10. Characteristics of grain sorghum hybrids evaluated in yield tests in Tennessee during 2008 provided by participating seed companies.**

Brand	Hybrid	Grain Color	Maturity	Head Type	Green Bug Resistance	Released or Experimental	Comments
Asgrow	A571	Bronze	Med-Late	Open	---	R	---
DeKalb	DKS37-07	Bronze	Med-Early	---	---	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	---
Dyna-Gro	751B	Bronze	105	Semi-Compact	---	R	Performance on all soil types; consistent high yields
Dyna-Gro	772B	Bronze	118	---	---	R	Excellent stalk strength and stress tolerance
Dyna-Gro	778B	Bronze	125	---	---	R	v. good stress, drought, mod resist charcoal rot, good on clay and dryland
Dyna-Gro	780B	Bronze	111	Compact	---	R	Very good standability; adapted to dryland
FFR	x93-50	Bronze	---	---	---	E	---
FFR	x93-55	Bronze	---	---	---	E	---
FFR	x93-57	Bronze	---	---	---	E	---
Pioneer	84G62	Bronze	125	Open	---	R	---

**Table 11. Contact information for grain sorghum seed companies participating in yield tests in Tennessee during 2008.**

Company	Contact	Phone	Email	Web site	Address
Monsanto (Asgrow, Dekalb)		800-335-2676		<a href="http://www.asgrow.com">www.asgrow.com</a>	
Tennessee Farmers Coop (FFR)	Jim Payne Andy Rowsey Curtis Yates Bobby Hooper Chris Morris	901-652-0903 731-225-2032 865-567-8174 615-390-7587 615-218-7963	<a href="mailto:jpayne@ourcoop.com">jpayne@ourcoop.com</a>	<a href="http://www.ourcoop.com">www.ourcoop.com</a>	West TN    East & Middle TN
Crop Production Services (Dyna-Gro)	Brandon Sheridan	901-277-3638	<a href="mailto:brandon.sheridan@uap.com">brandon.sheridan@uap.com</a>	<a href="http://www.dynagroseed.com">www.dynagroseed.com</a>	57 Germantown Ct Suite 200 Cordova, TN 38018
Pioneer Hi-Bred Int.	Michael Hughes	800-331-2475	<a href="mailto:michael.hughes@pioneer.com">michael.hughes@pioneer.com</a>	<a href="http://www.pioneer.com">www.pioneer.com</a>	700 Boulevard South, Suite 302, Huntsville, AL 35802