Grain Sorghum
Hybrid Tests in Tennessee

2005

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Variety test results are posted on UT's website at:

http://taes.tennessee.edu/researchprograms/Variety_trials/
and
www.utcrops.com

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County Standard Grain Sorghum Tests

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2005 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). 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 except at Knoxville where the plot size was 18 feet in length. 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 2005. Tables 4 and 5 contain the two-year data, Tables 6 and 7 contain the three-year data. The **County Standard Test** data on 13 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 and REC tests and Table 10 contains the phenotypic trait data for the grain sorghum hybrids tested in 2005.

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 2005 season was characterized by several timely rainfall events during critical periods of the growing season. Rainfall events were prompted by hurricane aftermaths (especially Dennis, Katrina, and Rita) passing through most of the state. Daytime temperatures were high (several 90+ F days) during pollination and grain fill periods at all locations.

Table 1. Location information from Research and Education Centers where the grain sorghum hybrid tests were conducted in 2005.

Experiment Station	Location	Planting Date	Harvest Date	Seeding Rate	Soil Type
East Tennessee	Knoxville	May 12, 2005	September 23, 2005	87,600	Sequatchie Silt Loam
Middle Tennessee	Spring Hill	May 2, 2005	October 17, 2005	87,600	Maury Silt Loam
Highland Rim	Springfield	May 27, 2005	November 2, 2005	87,600	Dickson Silt Loam
Milan	Milan	June 7, 2005	October 12, 2005	87,600	Henry, Loring Silt Loam

Table 2. Mean yields of 14 grain sorghum hybrids evaluated in four environments in Tennessee during 2005.

Brand	Hybrid	Avg. Yield† ± Std. Err. (n=4)	Avg. Yield† ± Std. Err. (n=4)	Knoxville	Spring Hill	Springfield	Milan
		bu/a	lbs/a				
Pioneer	84G62	124 ± 4	6820 ± 225	9311	6413	4428	7126
Monsanto	MSC 531	120 ± 4	6579 ± 225	8729	6444	3880	7263
DeKalb	DKS53-11	118 ± 5	6489 ± 267	8391	7406	3680	6477
Monsanto	MTC 15525	117 ± 4	6444 ± 240	8283	6427	4344	6720
DeKalb	DKS54-00	117 ± 6	6433 ± 303	9201	6570	2716	7245
Monsanto	MSC 332	115 ± 5	6319 ± 254	9131	5745	4440	5958
Dyna-Gro	751B	114 ± 4	6296 ± 225	8431	6318	4030	6406
Pioneer	83G66	114 ± 4	6291 ± 225	8309	6789	4022	6043
Golden Harvest	H-502	114 ± 4	6284 ± 225	8731	6264	4059	6083
Dyna-Gro	780B	110 ± 4	6036 ± 240	8051	5645	4477	5969
Golden Harvest	Ex-5513	108 ± 4	5959 ± 240	7857	6385	3445	6147
FFR	322	108 ± 4	5937 ± 240	7466	5611	4520	6152
FFR	318	107 ± 4	5910 ± 240	8280	6366	3541	5455
FFR	319W	104 ± 4	5731 ± 240	7837	6264	3356	5467
Avg. (lbs/a)		**114**	**6254**	**8543**	**6306**	**3976**	**6304**
L.S.D..05 (lbs/a)		**12**	**667**	**1079**	**1851**	**1338**	**1030**
C.V. (%)		**12.5**	**12.5**	**6.6**	**17.1**	**17.7**	**9.4**

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

Table 3. Overall mean yields and agronomic characteristics of 14 grain sorghum hybrids evaluated in four environments in Tennessee during 2005.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=4)	Moisture at Harvest (n=4)	Test Weight (n=3)	Head Blast† (n=1)	Height (n=4)	Lodging‡ (n=3)	Bird Damage§ (n=3)	Head Type ¶ (n=2)
		bu/a	%	lbs/bu	score	in.	score	score	score
Pioneer	84G62	124 ± 4	14.4	59.4	1.5	54	1.0	1.3	2.8
Monsanto	MSC 531	120 ± 4	14.3	58.5	2.0	55	1.0	1.3	2.9
DeKalb	DKS53-11	118 ± 5	14.5	59.2	1.0	53	1.0	1.3	2.0
Monsanto	MTC 15525	117 ± 4	14.3	60.8	2.0	54	1.0	1.3	2.7
DeKalb	DKS54-00	117 ± 6	14.6	58.7	1.3	55	1.0	1.3	2.3
Monsanto	MSC 332	115 ± 5	14.6	59.8	1.2	58	1.0	1.3	2.4
Dyna-Gro	751B	114 ± 4	14.4	59.2	1.7	55	1.0	1.3	3.3
Pioneer	83G66	114 ± 4	14.3	58.1	1.2	56	1.0	1.3	2.0
Golden Harvest	H-502	114 ± 4	14.3	59.1	1.3	54	1.0	1.3	3.1
Dyna-Gro	780B	110 ± 4	14.4	59.3	1.3	55	1.0	1.3	3.5
Golden Harvest	Ex-5513	108 ± 4	14.2	57.7	1.3	57	1.0	1.3	1.9
FFR	322	108 ± 4	14.6	59.0	1.5	55	1.0	1.3	3.3
FFR	318	107 ± 4	14.2	57.7	1.2	55	1.0	1.3	2.5
FFR	319W	104 ± 4	13.8	58.0	1.3	55	1.0	1.3	3.6

Bushel weight of No. 2 sorghum equals 55 lbs.

DAP = days after planting

† 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.

‡ 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 4. Mean yields of ten grain sorghum hybrids evaluated in three environments for two years (2004-2005) in Tennessee.

Brand	Hybrid	Avg. Yield† ± Std. Err. (n=6)	Avg. Yield† ± Std. Err. (n=6)	Knoxville	Springfield	Milan
		bu/a	---------- lbs/a----------			
Pioneer	84G62	132 ± 3	7260 ± 148	8921	5195	7664
Pioneer	83G66	126 ± 3	6929 ± 148	8610	5244	6932
DeKalb	DKS54-00	123 ± 3	6757 ± 182	8847	4082	7340
DeKalb	DKS53-11	123 ± 3	6748 ± 160	8755	4442	7047
Dyna-Gro	780B	122 ± 3	6707 ± 154	8715	4937	6469
Golden Harvest	H-502	121 ± 3	6666 ± 148	8602	4685	6711
Dyna-Gro	751B	121 ± 3	6645 ± 148	8722	4367	6845
FFR	322	120 ± 3	6602 ± 154	8213	4821	6770
FFR	318	114 ± 3	6288 ± 154	7858	4612	6395
FFR	319W	110 ± 3	6029 ± 154	7656	4007	6424
Avg. (lbs/a)		**121**	**6663**	**8490**	**4639**	**6860**
L.S.D..05 (lbs/a)		**9**	**516**	**885**	**1046**	**804**
C.V. (%)		**9.0**	**9.0**	**6.8**	**14.3**	**7.9**

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

Table 5. Overall mean yields and agronomic characteristics of ten grain sorghum hybrids evaluated in three environments for two years (2004-2005) in Tennessee.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=6)	Moisture at Harvest (n=6)	Test Weight (n=6)	Heading (n=1)	Head Blast† (n=4)	Height (n=6)	Lodging‡ (n=3)	Bird Damage§ (n=3)	Headtype¶ (n=2)
		bu/a	%	lbs/bu	DAP	score	in.	score	score	score
Pioneer	84G62	132 ± 3	15.3	59.0	66	1.0	52	1.0	1.3	2.8
Pioneer	83G66	126 ± 3	15.1	58.0	65	1.0	54	1.0	1.3	2.0
DeKalb	DKS54-00	123 ± 3	15.6	57.8	73	1.0	54	1.0	1.3	2.3
DeKalb	DKS53-11	123 ± 3	16.6	58.3	74	1.0	54	1.0	1.3	2.0
Dyna-Gro	780B	122 ± 3	15.4	59.2	69	1.0	55	1.0	1.3	3.5
Golden Harvest	H-502	121 ± 3	14.9	58.7	64	1.0	54	1.0	1.3	3.1
Dyna-Gro	751B	121 ± 3	14.9	58.7	64	1.0	55	1.0	1.3	3.3
FFR	322	120 ± 3	15.3	58.5	67	1.0	54	1.0	1.3	3.3
FFR	318	114 ± 3	14.9	57.2	65	1.0	55	1.0	1.3	2.5
FFR	319W	110 ± 3	14.3	57.0	64	1.0	54	1.0	1.3	3.6

Bushel weight of No. 2 sorghum equals 55 lbs.

DAP = days after planting

† 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 errect; 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 nine grain sorghum hybrids evaluated in three environments for three years (2003-2005) in Tennessee.

Brand	Hybrid	Avg. Yield† ± Std. Err. (n=9)	Avg. Yield† ± Std. Err. (n=9)	Knoxville	Springfield	Milan
		bu/ac	---------- lbs/a----------			
Pioneer	84G62	128 ± 2	7018 ± 116	8749	5299	7006
Golden Harvest	H-502	123 ± 2	6741 ± 119	8394	5015	6815
Dyna-Gro	751B	122 ± 2	6721 ± 116	8582	4800	6782
Pioneer	83G66	122 ± 2	6703 ± 116	8238	5110	6759
Dyna-Gro	780B	121 ± 2	6678 ± 123	8582	5067	6385
FFR	322	119 ± 2	6569 ± 119	8126	5118	6464
DeKalb	DKS54-00	118 ± 2	6507 ± 134	8627	4297	6598
FFR	318	115 ± 2	6337 ± 119	7777	5133	6100
FFR	319W	109 ± 2	6000 ± 119	7401	4663	5937
Avg. (lbs/a)		**120**	**6586**	**8275**	**4945**	**6539**
L.S.D..05 (lbs/a)		**8**	**461**	**722**	**912**	**787**
C.V. (%)		**8.7**	**8.7**	**6.2**	**12.8**	**8.6**

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

Table 7. Overall mean yields and agronomic characteristics of nine grain sorghum hybrids evaluated in three environments for three years (2003-2005) in Tennessee.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=9)	Moisture at Harvest (n=8)	Test Weight (n=9)	Heading (n=2)	Head Blast† (n=7)	Height (n=9)	Lodging‡ (n=6)	Bird Damage§ (n=4)	Headtype¶ (n=3)
		bu/a	%	lbs/bu	DAP	score	in.	score	score	score
Pioneer	84G62	128 ± 2	16.5	58.7	66	1.0	53	1.0	1.4	2.9
Golden Harvest	H-502	123 ± 2	16.1	58.4	66	1.0	56	1.0	1.4	3.1
Dyna-Gro	751B	122 ± 2	16.0	58.6	66	1.0	56	1.0	1.4	3.2
Pioneer	83G66	122 ± 2	17.0	57.4	67	1.0	56	1.0	1.4	2.1
Dyna-Gro	780B	121 ± 2	16.7	58.9	69	1.0	56	1.0	1.4	3.3
FFR	322	119 ± 2	16.8	58.1	68	1.0	55	1.0	1.4	3.1
DeKalb	DKS54-00	118 ± 2	17.6	56.9	71	1.0	56	1.0	1.4	2.4
FFR	318	115 ± 2	15.9	56.8	64	1.0	56	1.0	1.4	2.4
FFR	319W	109 ± 2	15.4	56.6	64	1.0	55	1.0	1.4	3.6

Bushel weight of No. 2 sorghum equals 55 lbs.

DAP = days after planting

† 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 13 grain sorghum hybrids in three County Standard Tests in Tennessee and Ketucky during 2005.†‡

MS	Hybrid	Avg. Yld	Avg. Yld	Moisture	KY Hardin	KY McCracken	KY Obion
		bu/a	lbs/a	%	5/17 §	5/26	5/18
A	*DeKalb DKS53-11	109	5968	12.7	5498	5973	6427
A	****DeKalb DKS54-00	108	5913	12.6	4789	5803	7141
A	****Pioneer 84G62	107	5863	12.4	5624	5627	6333
A	Dyna-Gro 780B	101	5577	12.6	3665	5495	7574
A	*Golden Harvest H502	101	5572	12.7	3632	5495	7591
A	*FFR 322	100	5495	12.6	3917	5363	7205
A	**Pioneer 83G66	98	5368	13.0	4969	5176	5963
A	Croplan CPL KS585	98	5363	12.1	3810	5654	6630
A	**FFR 319W	97	5357	12.2	4672	4884	6520
A	*Dyna-Gro 751B	96	5297	12.8	3708	5412	6762
A	Golden Harvest H5513	96	5291	12.2	4077	5346	6447
A	**Triumph TR 82-G	95	5209	13.0	3504	5500	6616
A	*Croplan CPL 514GS	94	5165	13.1	3508	5533	6444
	Average (lbs/a)	**100**	**5495**		**4257**	**5484**	**6743**

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).

‡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 2004, 2003, and/or 2002.

Table 9. Overall average yields and moistures of eight grain sorghum hybrids evaluated in county standard tests and Research and Education Center tests in Tennessee during 2005.†

		County Standard Tests		Experiment Station Tests	
Brand	**Hybrid**	**Avg. Yield (n=4)**	**Moisture (n=4)**	**Avg. Yield (n=4)**	**Moisture (n=4)**
		bu/a	%	bu/a	%
DeKalb	DKS53-11	109	12.7	118	14.5
DeKalb	DKS54-00	108	12.6	117	14.6
Pioneer	84G62	107	12.4	124	14.4
Dyna-Gro	780B	101	12.6	110	14.4
Golden Harvest	H-502	101	12.7	114	14.3
FFR	322	100	12.6	108	14.6
Pioneer	83G66	98	13.0	114	14.3
FFR	319W	97	12.2	104	13.8
Dyna-Gro	751B	96	12.8	114	14.4
Golden Harvest	Ex-5513	96	12.2	108	14.2
Average (lbs/a)		**101**	**12.6**	**113**	**14.4**

† 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 2005.†

Brand	Hybrid	Grain Color	Maturity	Head Type	Green Bug Resistance	Released or Experimental	Comments
DeKalb	DKS53-11	Bronze	110	Semi-Compact	C,E,I	R	For high yield environments
DeKalb	DKS54-00	Bronze	110	Semi-Compact	C,E,I	R	For high yield environments, residue proven
Dyna-Gro	751B	Bronze	105	Semi-Compact	---	R	Well suited to high yield environments
Dyna-Gro	780B	Bronze	111	Compact	---	R	Strong workhorse, handles stress
FFR	318	Bronze	113	Compact	---	R	---
FFR	322	Red	115	Compact	---	R	---
FFR	319W	Cream	113	Open	---	R	---
Golden Harvest	Ex-5513	Bronze	118-128	---	---	E	Well suited for stress
Golden Harvest	H-502	Red	112	Semi-Compact	---	R	Well suited to high yield environments, Excellent early vigor
Monsanto	MSC 332	---	Med-Late	---	---	E	---
Monsanto	MSC 531	---	Late	---	---	E	---
Monsanto	MTC 15525	---	Med-Late	---	---	E	---
Pioneer	83G66	Red	122	Semi-Compact	---	R	---
Pioneer	84G62	Bronze	125	Open	---	R	---

† Information on this table provided by the respective seed companies.