Grain Sorghum
Variety Tests in Tennessee

2003

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

http://taes.tennessee.edu/researchprograms/Variety_trials/

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County Standard Sorghum Tests

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Grain Sorghum Test

Fayette	**Jamie Jenkins**	**Ed & Tom Karcher**
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PERFORMANCE OF GRAIN SORGHUM HYBRIDS IN TENNESSEE

2003

EXPERIMENT STATION & 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 Knoxville, Highland Rim, and Milan Experiment Stations, and at Ames Plantation. The trial contained 16 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 **Experiment Station Test** data for 2003. Tables 4 and 5 contain the two-year data, Tables 6 and 7 contain the three-year data. The **County Standard Test** data on 10 hybrids from six counties are reported in Table 8. Table 9 contains the data on the grain sorghum hybrids that were common in the County and Experiment Station tests and Table 10 contains the phenotypic trait data for the grain sorghum hybrids tested in 2003.

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.

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%.

EXPERIMENT STATION TESTS

Table 1. Location information from experiment stations where the grain sorghum hybrid tests were conducted in 2003.

Experiment Station	Location	Planting Date	Harvest Date	Plant Population	Soil Type
Knoxville	Knoxville	June 10, 2003	October 30, 2003	87,600	Sequatchie Silt Loam
Highland Rim	Springfield	May 28, 2003	October 9, 2003	87,600	Sango Silt Loam
Milan (non-irrigated)	Milan	May 14, 2003	September 25, 2003	87,600	Falaya Silt Loam
Ames Plantation	Grand Junction	May 12, 2003	September 16, 2003	87,600	Lexington Silt Loam

Table 2. Mean yields of 16 grain sorghum hybrids evaluated in four environments in Tennessee during 2003.

Brand	Hybrid	Avg. Yield† ± Std. Err. (n=4)	Knoxville	Springfield	Milan	Ames
		---------- lbs/a----------				
Asgrow	A571	6836 ± 164	7641	6339	6641	6725
Golden Harvest	H-502	6723 ± 173	7978	5676	7022	6218
FFR	318	6611 ± 172	7617	6175	5511	7139
Dyna-Gro	780B	6603 ± 174	8316	5327	6219	6552
Terral	TV 96H81	6575 ± 163	8147	6299	5550	6302
Dyna-Gro	751B	6566 ± 164	8302	5664	6657	5641
Pioneer	84G62	6520 ± 164	8406	5508	5692	6475
FFR	322	6483 ± 164	7952	5712	5851	6418
Pioneer	8282	6471 ± 162	7720	5363	5904	6898
Triumph	TR 82-G	6397 ± 182	8061	5211	5962	6355
Pioneer	83G66	6280 ± 163	7495	4844	6413	6367
Asgrow	A459	6259 ± 163	7562	5467	5989	6019
Dekalb	DKS54-00	5919 ± 173	8187	4726	5112	5648
FFR	319W	5865 ± 162	6893	5976	4963	5626
Pioneer	83G15	5857 ± 183	7945	5074	5469	4939
Triumph	TR 461	5600 ± 174	6964	5001	5167	5268
	Avg. (lbs/a)	**6389**	**7824**	**5541**	**5922**	**6182**
	L.S.D..05 (lbs/a)	**443**	**571**	**971**	**1077**	**1067**
	C.V. (%)	**8.3**	**4.4**	**10.1**	**10.2**	**9.8**

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

Table 3. Overall mean yields and agronomic characteristics of 16 grain sorghum hybrids evaluated in four environments in Tennessee during 2003.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=4)	Moisture at Harvest (n=3)	Test Weight (n=4)	Heading (n=2)	Head Blast† (n=1)	Height (n=4)	Lodging‡ (n=4)	Bird Damage§ (n=2)	Headtype¶ (n=1)
		lbs/a	%	lbs/bu	DAP	score	in.	score	score	score
Asgrow	A571	6836 ± 164	17.7	56.0	68	2.0	57	1.0	1.3	2
Golden Harvest	H-502	6723 ± 173	18.1	58.2	66	2.7	58	1.0	1.3	3
FFR	318	6611 ± 172	17.4	56.7	64	2.3	59	1.0	1.3	2
Dyna-Gro	780B	6603 ± 174	18.7	58.7	68	1.3	59	1.0	1.3	2
Terral	TV 96H81	6575 ± 163	18.7	58.3	67	1.7	59	1.0	1.3	4
Dyna-Gro	751B	6566 ± 164	17.7	58.4	67	2.7	58	1.0	1.3	3
Pioneer	84G62	6520 ± 164	18.2	58.5	67	3.3	56	1.0	1.3	4
FFR	322	6483 ± 164	19.1	58.0	67	2.3	57	1.0	1.3	2
Pioneer	8282	6471 ± 162	19.5	57.1	68	2.7	60	1.0	1.3	4
Triumph	TR 82-G	6397 ± 182	18.9	58.8	69	1.0	60	1.0	1.3	4
Pioneer	83G66	6280 ± 163	19.7	57.0	68	1.3	58	1.0	1.3	3
Asgrow	A459	6259 ± 163	16.2	57.6	67	3.0	59	1.0	1.3	3
Dekalb	DKS54-00	5919 ± 173	20.5	56.0	68	2.0	59	1.0	1.3	3
FFR	319W	5865 ± 162	17.1	56.5	65	3.0	59	1.0	1.3	4
Pioneer	83G15	5857 ± 183	19.0	56.7	70	3.3	55	1.0	1.3	3
Triumph	TR 461	5600 ± 174	17.9	57.9	69	3.7	58	1.0	1.3	4

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 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 4. Mean yields of 11 grain sorghum hybrids evaluated in four environments for two years (2002-2003) in Tennessee.

Brand	Hybrid	Avg. Yield† ± Std. Err. (n=8)	Knoxville	Springfield	Milan	Ames
		---------- lbs/a----------				
Pioneer	84G62	6087 ± 132	7979	4603	5113	6653
Dyna-Gro	751B	6004 ± 128	8243	4501	5317	5954
Asgrow	A571	5909 ± 128	7875	4899	5001	5862
Pioneer	83G66	5818 ± 127	7493	4046	5574	6158
Pioneer	8282	5741 ± 127	7435	4171	5206	6151
FFR	318	5711 ± 131	7084	4695	4681	6384
FFR	322	5678 ± 128	7141	4129	4986	6458
Dyna-Gro	780B	5635 ± 132	7723	4326	4581	5910
Asgrow	A459	5433 ± 132	7440	4379	4438	5476
Dekalb	DKS54-00	5287 ± 131	7920	4249	3497	5480
FFR	319W	5163 ± 131	6425	4743	3905	5580
	Avg. (lbs/a)	**5679**	**7524**	**4431**	**4755**	**6006**
	L.S.D..05 (lbs/a)	**415**	**866**	**757**	**910**	**858**
	C.V. (%)	**10.5**	**8.4**	**11.6**	**13.2**	**10.2**

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

Table 5. Overall mean yields and agronomic characteristics of 11 grain sorghum hybrids evaluated in four environments for two years (2002-2003) in Tennessee.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=8)	Moisture at Harvest (n=7)	Test Weight (n=5)	Heading (n=2)	Head Blast† (n=4)	Height (n=8)	Lodging‡ (n=8)	Bird Damage§ (n=3)	Panicle Exertion (n=1)	Headtype¶ (n=3)
		lbs/a	%	lbs/bu	DAP	score	in.	score	score	in.	score
Pioneer	84G62	6087 ± 132	16.4	58.9	67	2.3	52	1.0	1.2	8	3
Dyna-Gro	751B	6004 ± 128	16.7	58.9	67	2.1	54	1.0	1.2	9	3
Asgrow	A571	5909 ± 128	16.5	56.5	68	2.0	53	1.0	1.2	9	3
Pioneer	83G66	5818 ± 127	17.5	57.6	68	1.7	54	1.0	1.2	10	2
Pioneer	8282	5741 ± 127	17.8	57.6	68	1.7	56	1.0	1.2	11	4
FFR	318	5711 ± 131	16.0	57.3	64	2.3	55	1.0	1.2	11	2
FFR	322	5678 ± 128	17.3	58.5	67	1.8	54	1.0	1.2	9	2
Dyna-Gro	780B	5635 ± 132	16.6	59.0	68	2.0	54	1.0	1.2	9	2
Asgrow	A459	5433 ± 132	15.4	58.2	67	2.3	55	1.0	1.2	8	3
Dekalb	DKS54-00	5287 ± 131	17.9	56.9	68	2.4	56	1.0	1.2	10	3
FFR	319W	5163 ± 131	15.9	57.2	65	2.2	54	1.0	1.2	8	3

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 6. Mean yields of six grain sorghum hybrids evaluated in three environments for three years (2001-2003) in Tennessee.

Brand	Hybrid	Avg. Yield† ± Std. Err. (n=9)	Springfield	Milan	Ames
			----------lbs/a----------		
Pioneer	84G62	5035 ± 120	4535	5078	5492
Pioneer	8282	4977 ± 116	4476	5270	5184
Pioneer	83G66	4921 ± 118	4048	5591	5125
FFR	322	4777 ± 116	4222	4899	5211
Asgrow	A459	4451 ± 120	4151	4585	4617
Dekalb	DKS54-00	4355 ± 120	4398	3882	4786
	Avg. (lbs/a)	**4753**	**4305**	**4884**	**5069**
	L.S.D..05 (lbs/a)	**477**	**786**	**1010**	**695**
	C.V. (%)	**12.9**	**12.7**	**15.2**	**10.3**

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

Table 7. Overall mean yields and agronomic characteristics of six grain sorghum hybrids evaluated in three environments for three years (2001-2003) in Tennessee.

Brand	Hybrid	Avg. Yield ± Std. Err. (n=9)	Moisture at Harvest (n=9)	Test Weight (n=3)	Heading (n=2)	Maturity (n=1)	Head Blast† (n=4)	Height (n=7)	Lodging‡ (n=7)	Bird Damage§ (n=1)	Panicle Exertion (n=2)	Headtype¶ (n=3)
		lbs/a	%	lbs/bu	DAP	DAP	score	in.	score	score	in.	score
Pioneer	84G62	5035 ± 120	15.7	57.3	61	128	2.3	51	1.0	1.0	9	3
Pioneer	8282	4977 ± 116	16.8	56.4	61	128	1.7	55	1.0	1.0	12	3
Pioneer	83G66	4921 ± 118	16.6	56.1	60	128	1.7	53	1.0	1.0	12	3
FFR	322	4777 ± 116	16.6	56.9	61	129	1.8	52	1.0	1.0	11	3
Asgrow	A459	4451 ± 120	14.9	57.0	60	129	2.3	53	1.0	1.0	11	3
Dekalb	DKS54-00	4355 ± 120	16.7	54.5	60	128	2.4	55	1.0	1.0	15	4

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.

COUNTY STANDARD TESTS

Bob Williams, Coordinator

Table 8. Yields of 10 grain sorghum hybrids in six County Standard Tests in West Tennessee and Kentucky during 2003.†‡

MS	Hybrid	Avg. Yld	Moisture	KY Ballard	Fayette	Hardin	Haywood	Lauderdale	Obion
		lbs/a	%	----------lbs/a----------					
A	**TERRAL 96H81**	6545	15.7	8745	6655	7425	5005	4840	6600
AB	**TRIUMPH TR82G**	6435	15.0	9790	5995	7260	5610	4180	5885
AB	**DYNAGRO 751B**	6325	16.1	9130	6215	6930	4620	4950	6270
ABC	****PIONEER 84G62**	6215	15.8	9240	6435	5830	4565	5335	5995
ABC	***PIONEER 83G66**	6050	15.9	8140	6215	7095	4565	4345	6050
ABC	**PIONEER 8282**	6050	16.6	8745	6600	7095	3410	4510	5775
ABC	****DEKALB DKS54-00**	5995	15.7	8415	6930	7040	4565	4290	4565
BC	**ASGROW A459**	5885	14.7	8415	5720	7315	4620	3190	5885
BC	**ASGROW A571**	5830	15.9	8525	5830	6820	3905	3905	5830
C	**TRIUMPH TR461**	5610	15.6	7590	5170	6215	3630	5280	5830
	Average (lbs/a)	6094		8674	6177	6903	4450	4483	5869

Bushel weight of No. 2 sorghum equals 55 lbs.

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.

*Hybrids denoted with an asterisk (*) were in the top performing group for two years.

Table 9. Overall average yields and moistures of 11 grain sorghum hybrids evaluated in county standard tests and experiment station tests in Tennessee during 2003.†

		County Standard Tests		Experiment Station Tests	
Brand	**Hybrid**	**Avg. Yield (n=6)**	**Moisture (n=6)**	**Avg. Yield (n=4)**	**Moisture (n=4)**
		lbs/a	%	lbs/a	%
Terral	TV 96H81	6545	15.7	6575	18.7
Triumph	TR 82-G	6435	15.0	6397	18.9
Dyna-Gro	751B	6325	16.1	6566	17.7
Pioneer	84G62	6215	15.8	6520	18.2
Pioneer	8282	6050	16.6	6471	19.5
Pioneer	83G66	6050	15.9	6280	19.7
Dekalb	DKS54-00	5995	15.7	5919	20.5
Asgrow	A459	5885	14.7	6259	16.2
Asgrow	A571	5830	15.9	6836	17.7
Triumph	TR 461	5610	15.6	5600	17.9
Average (lbs/a)		**6094**	**15.7**	**6342**	**18.5**

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

Table 10. Characteristics of grain sorghum hybrids evaluated in yield tests in Tennessee during 2003.†

Brand	Hybrid	Grain Color	Maturity	Head Type	Released or Experimental	Comments
Asgrow	A459	Bronze	Med	Open	R	---
Asgrow	A571	Bronze	Med-Late	Compact	R	---
Dekalb	DKS54-00	Bronze	Med-Late	Semi-Compact	R	---
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	H-502	Red	112	Semi-Compact	R	Well suited to high yield environments
Pioneer	8282	Red	121	Open	R	---
Pioneer	83G15	Bronze	124	Semi-Compact	R	---
Pioneer	83G66	Red	122	Semi-Compact	R	---
Pioneer	84G62	Bronze	122	Open	R	---
Terral	TV 96H81	Red	Med-Late	Open	R	Well suited for mixed or heavier soils
Triumph	TR 461	Red	100	Open	R	---
Triumph	TR 82-G	Red	120	Open	R	Great uniformity, resistant to greenbugs C & E

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