



EVALUATION OF GRAIN SORGHUM HYBRIDS IN ALABAMA, 1992

Department of Agronomy and Soils Departmental Series No. 167
Alabama Agricultural Experiment Station Auburn University
Lowell T. Frobish, Director January 1993 Auburn University, Alabama

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGMENTS.....	4
INTRODUCTION	5
EXPERIMENTAL PROCEDURES.....	5
VARIETY COMPARISONS.....	6
TABLE 1. LOCATIONS AND CULTURAL PRACTICES FOR THE 1992 GRAIN SORGHUM HYBRID TESTS.....	8
NORTHERN ALABAMA	
TABLE 2. BELLE MINA GRAIN SORGHUM HYBRID TRIAL, 1992.....	9
TABLE 3. WINFIELD GRAIN SORGHUM HYBRID TRIAL, 1992.....	10
CENTRAL ALABAMA	
TABLE 4. MARION JUNCTION GRAIN SORGHUM HYBRID TRIAL, 1992.....	11
SOUTHERN ALABAMA	
TABLE 5. MONROEVILLE GRAIN SORGHUM HYBRID TRIAL, 1992.....	12
TABLE 6. PLANT HEIGHT OF GRAIN SORGHUM HYBRIDS BY LOCATION, 1992.....	13
TABLE 7. GROWING SEASON RAINFALL, 1990-92.....	14
TABLE 8. SOIL TYPES FOR GRAIN SORGHUM TRIALS, 1992.....	14
SOURCES OF SEED FOR THE 1992 GRAIN SORGHUM TESTS.....	15
ACCEPTABLE HYBRIDS FOR 1993.....	16

Information contained herein is available to all persons
regardless of race, color, sex, or national origin.

ACKNOWLEDGMENTS

The performance trials were conducted in cooperation with the following substation and experiment field superintendents and their staffs whose quality work makes this report a reliable source of information for farmers in their areas.

Northern Alabama

Tennessee Valley Substation, Belle Mina - W. B. Webster,
H. E. Burgess,
B. E. Norris

Upper Coastal Plain Substation, Winfield - W. A. Griffey,
R. C. Rawls

Central Alabama

Black Belt Substation, Marion Junction - J. L. Holliman,
J. R. Harris

Southern Alabama

Monroeville Experiment Field, Monroeville - J. R. Akridge

Appreciation is also expressed to Mien-Huei Tzeng, Research Data Analysis, for the computation, summarization, and analysis of the data in this report.

EVALUATION OF GRAIN SORGHUM HYBRIDS IN ALABAMA, 1992

K.M. Glass and D.I. Bransby¹

INTRODUCTION

Grain sorghum performance tests are conducted annually throughout Alabama by the Alabama Agricultural Experiment Station. The test locations in 1992 were two in north, one in central, and one in south Alabama. The four locations used represent major soil and climatic areas of the State. Since the yield of hybrids varies with location, this report should be carefully studied before a hybrid is selected.

EXPERIMENTAL PROCEDURES

Cultural practices were uniform for all hybrids within a given test. The experimental design for all tests was a randomized complete block with four replications. Tests plots consisted of two rows 36 inches apart, 20 or 30 feet in length. The target plant population was 60,000 plants per acre, with a seeding rate 25 percent higher than normal to ensure a good stand. Test cultural practices are listed in table 1.

Grain yields were obtained by harvesting the whole test plot with a plot combine, and adjusting harvested grain weight and moisture to a standard 14 percent moisture and 56 pounds per bushel.

Lodging is given as the percentage of plants broken or leaning at an angle of more than 45 degrees. The seedheads of lodged plants were not included in the yields reported.

Time (days) to mid-bloom is one measure of relative maturity.

¹Research Assistant and Professor of Agronomy and Soils.

This is taken as the number of days from planting to the date when approximately one-half of the heads in the plot are in bloom.

Bird damage has been very heavy at many locations in recent years. In 1992 grain sorghum hybrids were evaluated at only four locations, and bird control noise devices were used to help keep bird damage to a minimum at each test location. There was considerable bird damage at the Tennessee Valley Substation (Belle Mina) in 1992. The test was discarded at this location in 1990 and also in 1991 because of severe bird damage, despite the use of a bird alarm. Bird damage, which can be a problem in small fields, was lower at the remaining locations in 1992. In selecting a hybrid, consideration should be given to bird populations; if damage is anticipated, bird-resistant hybrids should be used. However, bird-resistant grain sorghum hybrids are sometimes difficult to market and may have lower feed value than the non-bird-resistant hybrids.

VARIETY COMPARISONS

The performance of hybrids varies among years and locations. Small yield differences among hybrids may be the result of slight environmental or cultural differences rather than real differences in yield potential among hybrids. To aid in determining real differences, a statistical analysis of variance was performed on the data from each location. The L.S.D. (least significant difference) at the 5 percent level is reported to help determine real differences between hybrid yields for each location. If the yield difference between two varieties at a given location is greater than the L.S.D. value, the two hybrids are considered to be significantly different in yield. The C.V.

(coefficient of variation) is a measure of test variability. An increase in its value indicates a decrease in the precision and reliability of the test data.

The list of acceptable hybrids is based on 3-year-average grain yield and lodging data. The list is divided into three regions; north, central, and south. Since all acceptable hybrids are not equal in performance, a review of the data from several years at the test location most similar to a particular situation is the most reliable method for selecting a hybrid best suited for those particular farming seeds.

Anthracnose can be a problem in sorghum fields. There were sporadic outbreaks of this disease in 1987, but little evidence of it since then. However, in years prior to 1987, grain sorghum in many northeast and west-central Alabama counties was devastated by anthracnose. Some fields yielded 50 to 75 percent less grain than expected. Feed quality of much of the harvest grain from diseased fields also was poor. Resistant grain sorghum hybrids have been the best defense against anthracnose. Of available adapted grain sorghum hybrids, Deltapine G-1711 and Pioneer Brand 8333 have the best resistance to this disease. Other hybrids with some anthracnose resistance are Dekalb DK-64 and Pioneer Brand 8222. Good management plus the use of disease-resistant grain sorghum hybrids are necessary to reduce losses to anthracnose.

There was not a second or ratoon crop of sorghum in 1990, 1991, or 1992 at any location. Plant height of grain sorghum hybrids is reported as location averages, table 6.

Table 1. Locations and Cultural Practices for the 1992 Grain Sorghum Hybrid Tests

Location	Planting date	Nitrogen ¹ rate	Plant population	Harvest date	Herbicide	Insecticides
Tennessee Valley Substation... (Belle Mina)	April 28	80	60,000	August 25	Atrazine	None
Upper Coastal Plain Substation. (Winfield)	April 13	80	60,000	October 15	Atrazine	None
Black Belt Substation..... (Marion Junction)	April 27	100	60,000	September 1	Atrazine	None
Monroeville Experiment Field...	June 2	300	60,000	September 15	Atrazine	None

¹Pound per acre N. Lime, phosphorus, potassium, zinc, and sulfur were applied according to recommendation based on soil test.

Table 2. Belle Mina Grain Sorghum Hybrid Trial, 1992

Brand-Hybrid	1992 Yield	1991-92 2-yr. av.	1990-92 3-yr. av.	1992		
				Mid-	Bird	Lodged
				Bloom	Damage	Stalks
	Bu.	Bu.	Bu.	Mo./Day	Pct.	Pct.
Northrup King						
Savanna 5 *	88	-	-	7/6	10.0	0.0
Dekalb DK 64BR *	70	-	-	7/7	15.0	0.0
Capehart Contender	58	-	-	7/12	17.5	0.0
Deltapine G-522 DR	58	-	-	7/11	26.3	0.0
Northrup King 2660	57	-	-	7/11	21.3	0.0
Hy Performer Cherokee	53	-	-	7/9	31.3	0.0
FFR 321 DR	47	-	-	7/13	30.0	0.0
Dekalb DK 60	47	-	-	7/14	23.8	0.0
Capehart Challenger	45	-	-	7/10	25.0	0.0
AgraTech GK802G	43	-	-	7/11	40.0	0.0
Dekalb DK 40Y	41	-	-	7/6	27.5	0.0
Deltapine 1552	38	-	-	7/7	35.0	0.0
Dekalb DK 56	37	-	-	7/12	33.7	0.0
Hy Performer Wings	35	-	-	7/11	35.0	0.0
Pioneer 8212Y	31	-	-	7/14	52.5	0.0
Pioneer 8333	29	-	-	7/7	38.7	0.0
AgraTech 805GW	26	-	-	7/7	28.3	0.0
AFC 861	24	-	-	7/11	53.7	0.0
Hy Performer 1330 DR	17	-	-	7/11	62.5	0.0
Penn. Penngrain DR	13	-	-	7/6	50.0	0.0
Test Mean	43					
L.S.D. (.05)	25.9					
C.V. (%)	42.7					

* Bird-Resistant Hybrid.

Note: The test at this location was severely damaged by birds in 1992. This damage is reflected in the superiority of the bird resistant varieties and the unacceptably high CV. Therefore, results should be viewed with caution.

Table 3. Winfield Grain Sorghum Hybrid Trial, 1992

Brand-Hybrid	1992 Yield	1991-92 2-yr. av.	1990-92 3-yr. av.	1992		
				Mid-	Bird	Lodged
				Bloom	Damage	Stalks
	Bu.	Bu.	Bu.	Mo./Day	Pct.	Pct.
AFC 861.....	47	46	47	7/6	10.0	7.5
Northrup King Savanna 5 *.....	55	48	46	7/6	0.0	2.5
Hy Performer Cherokee..	51	44	41	7/5	5.0	0.0
Capehart Challenger...	45	40	41	7/6	16.3	0.0
Pioneer 8333.....	37	38	39	7/6	0.0	5.0
Hy Performer Wings....	44	38	38	7/6	12.5	5.0
Deltapine G-522 DR....	32	41	37	7/5	5.0	20.0
AgraTech 805GW.....	33	37	37	7/5	10.0	5.0
Dekalb DK 64BR *.....	61	44	36	7/6	2.5	12.5
AgraTech GK802G.....	32	37	36	7/4	7.5	10.0
Northrup King 2660....	40	38	35	7/6	10.0	2.5
Dekalb DK 60.....	41	41	35	7/7	12.5	0.0
FFR 321 DR.....	33	40	35	7/6	20.0	25.0
Capehart Contender....	29	37	34	7/7	0.0	7.5
Hy Performer 1330 DR..	13	27	28	7/6	17.5	35.0
Penn. Penngrain DR....	10	25	27	7/5	22.5	17.5
Deltapine 1552.....	36	36	-	7/2	12.5	0.0
Dekalb DK 56.....	41	34	-	7/6	0.0	0.0
Dekalb DK 40Y.....	24	28	-	7/3	0.0	20.0
Pioneer 8212Y.....	35	-	-	7/7	10.0	2.5
Test Mean.....	37					
L.S.D. (.05).....	16.3					
C.V. (%).....	31.1					

* Bird-Resistant Hybrid.

Table 4. Marion Junction Grain Sorghum Hybrid Trial, 1992

Brand-Hybrid	1992 Yield	1991-92 2-yr. av.	1990-92 3-yr. av.	1992		
				Mid- Bloom	Bird Damage	Lodged Stalks
	Bu.	Bu.	Bu.	Mo./Day	Pct.	Pct.
Capehart Challenger...	110	97	98	7/5	0.0	0.0
Northrup King 2660....	103	91	94	7/5	0.0	0.0
AgraTech GK802G.....	100	92	92	7/4	0.0	0.0
FFR 321 DR.....	93	84	88	7/6	0.0	0.0
Hy Performer Cherokee.	89	92	88	7/5	0.0	0.0
Dekalb DK 60.....	104	89	88	7/5	0.0	0.0
AgraTech 805GW.....	94	85	88	7/4	0.0	0.0
Deltapine G-1711.....	79	83	86	7/7	0.0	0.0
AFC 861.....	81	75	82	7/8	0.0	0.0
Northrup King						
Savanna 5 *.....	93	73	80	7/3	0.0	0.0
Pioneer 8333.....	90	76	80	7/4	0.0	0.0
Hy Performer Wings....	87	78	78	7/5	0.0	0.0
Dekalb DK 64BR *.....	90	65	67	7/2	0.0	0.0
Deltapine 1552.....	99	87	-	7/3	0.0	0.0
Dekalb DK 56.....	85	79	-	7/5	0.0	0.0
Dekalb X-166.....	92	-	-	7/5	0.0	0.0
Pioneer X3116.....	87	-	-	7/6	0.0	0.0
Pioneer 8212Y.....	79	-	-	7/6	0.0	0.0
Test Mean.....	92					
L.S.D. (.05).....	25.7					
C.V. (%).....	19.7					

* Bird-Resistant Hybrid.

Table 5. Monroeville Grain Sorghum Hybrid Trial, 1992

Brand-Hybrid	1992 Yield	1991-92 2-yr. av.	1990-92 3-yr. av.	1992		
				Mid-	Bird	Lodged
				Bloom	Damage	Stalks
	Bu.	Bu.	Bu.	Mo./Day	Pct.	Pct.
Hy Performer 1330 DR...	63	73	76	7/28	2.5	0.0
AgraTech 805GW.....	55	68	75	7/26	0.0	0.0
AgraTech GK802G.....	61	74	74	7/26	0.0	0.0
AFC 861.....	54	69	73	7/27	3.7	0.0
Deltapine G-522 DR.....	64	71	72	7/26	0.0	0.0
Capehart Challenger....	57	72	72	7/28	0.0	0.0
Pioneer 8333.....	52	67	72	7/26	1.3	0.0
Capehart Contender.....	57	70	71	7/26	1.3	0.0
Deltapine G-1711.....	46	65	70	7/29	1.3	0.0
FFR 321 DR.....	51	67	69	7/26	2.5	0.0
Hy Performer Cherokee..	53	68	69	7/28	0.0	0.0
Northrup King 2660.....	51	66	68	7/26	1.3	0.0
Northrup King						
Savanna 5 *.....	53	68	68	7/28	0.0	0.0
Hy Performer Wings.....	55	61	67	7/27	0.0	0.0
Dekalb DK 64BR *.....	63	70	65	7/25	0.0	0.0
Dekalb DK 60.....	26	54	63	8/4	8.8	0.0
Dekalb DK 56.....	51	68	-	7/31	1.3	0.0
Deltapine 1552.....	28	62	-	7/6	5.0	0.0
Pioneer 8212Y.....	53	-	-	7/30	1.3	0.0
Dekalb X-260.....	26	-	-	8/1	18.8	0.0
Dekalb X-274.....	21	-	-	8/2	18.8	0.0
Dekalb X-275.....	15	-	-	8/1	3.7	0.0
Test Mean.....	48					
L.S.D. (.05).....	12.4					
C.V. (%).....	18.2					

* Bird-Resistant Hybrid.

Table 6. Plant Height of Grain Sorghum Hybrids by Location, 1992

Brand-Hybrid	Plant Height by Location			
	Belle Mina	Winfield	Marion Junction	Monroeville
	<u>In.</u>	<u>In.</u>	<u>In.</u>	<u>In.</u>
AFC 861.....	55	51	54	49
AgraTech 805GW.....	55	54	55	47
AgraTech GK802G.....	51	46	52	48
Capehart Challenger...	53	52	53	50
Capehart Contender....	49	49	-	47
Dekalb DK 40Y.....	48	46	-	-
Dekalb DK 56.....	54	52	55	56
Dekalb DK 60.....	56	51	54	55
Dekalb DK 64BR *.....	63	57	64	59
Dekalb X-166.....	-	-	55	-
Dekalb X-260.....	-	-	-	54
Dekalb X-274.....	-	-	-	56
Dekalb X-275.....	-	-	-	56
Deltapine 1552.....	54	49	54	53
Deltapine G-1711.....	-	-	51	50
Deltapine G-522 DR....	48	45	-	48
FFR 321 DR.....	50	46	50	47
Hy Performer 1330 DR..	66	58	-	58
Hy Performer Cherokee.	55	51	53	50
Hy Performer Wings....	56	54	54	52
Northrup King 2660....	50	49	51	47
Northrup King Savanna 5 *.....	63	61	62	62
Penn. Penngrain DR....	45	43	-	-
Pioneer 8212Y.....	46	49	49	47
Pioneer 8333.....	53	46	50	47
Pioneer X3116.....	-	-	50	-

* Bird-Resistant Hybrid.

Table 7. Growing Season Rainfall, 1990-92

Test location	Year	Monthly rainfall							7 months total
		Mar.	Apr.	May	June	July	Aug.	Sept.	
-----inches-----									
Belle Mina	1990	8.0	4.5	5.0	3.9	3.8	1.2	1.5	27.9
	1991	8.0	9.0	9.5	1.8	2.1	2.0	3.7	36.1
	1992	4.4	1.8	2.3	9.1	5.8	4.3	5.2	32.9
Winfield	1990	6.9	3.2	7.2	7.3	3.1	2.1	2.1	25.5
	1991	4.8	14.8	15.0	4.5	1.9	2.9	3.1	47.0
	1992	3.9	1.5	1.1	4.5	8.4	5.2	2.3	26.9
Marion Junction	1990	9.9	4.5	5.0	1.6	3.5	0.8	0.7	26.0
	1991	3.8	6.1	8.1	3.3	4.3	3.9	2.9	32.4
	1992	3.1	3.2	1.7	3.8	5.5	2.7	4.2	24.2
Monroeville	1990	9.0	4.5	6.2	0.7	5.3	2.3	1.8	29.8
	1991	7.2	5.5	12.4	5.7	6.9	6.8	2.0	46.5
	1992	4.2	3.2	2.2	8.5	5.8	11.6	2.6	38.1

Table 8. Soil Types for Grain Sorghum Trials, 1992

Test Location	Soil Type
Belle Mina	Decatur silt loam
Winfield	Savannah loam
Marion Junction	Vaiden
Monroeville	Lucedale loam

Sources of Seed for the 1992 Grain Sorghum Test

Entry designation	Source of seed
AFC brand hybrids.....	Alabama Farmer's Cooperative P.O. Box 2227 Decatur, AL 35602
AgraTech brand hybrids.....	AgraTech Seeds, Inc. Rt. 1 Box 76A McCordsville, IN 46055
Capehart brand hybrids.....	Capehart Seed Service P.O. Box 10 Holland, MO 63853
Dekalb brand hybrids.....	Dekalb Plant Genetics 3100 Sycamore Road Dekalb, IL 60115
Deltapine brand hybrids.....	Delta and Pine Land Company P.O. Box 157 Scott, MS 38772
FFR brand hybrids.....	Alabama Farmer's Cooperative P.O. Box 2227 Decatur, AL 35602
Hy Performer brand hybrids.....	Helena Chemical Company 6075 Poplar Avenue Memphis, TN 38119
Northrup King brand hybrids.....	Northrup King Company Rt. 3 Box 265 LaGrange, NC 28551
Pennington brand hybrids.....	Seed Production, Inc. P.O. Box 192 Madison, GA 30650
Pioneer brand hybrids.....	Pioneer Hi-Bred International, Inc. 1000 West Jefferson Street Tipton, IN 46072

ACCEPTABLE HYBRIDS FOR 1993

All acceptable hybrids have been tested for 3 consecutive years in the region listed. All of the acceptable hybrids are not equal in performance. It is suggested that this report be carefully studied before choosing a hybrid. The hybrids are listed in descending order of 3-year-average yield for each region.

NORTH ALABAMA

<u>Brand name</u>	<u>Hybrid</u>
AFC	861
Northrup King	Savanna 5*
Hy Performer	Cherokee
Capehart	Challenger
Pioneer	8333
Hy Performer	Wings
Deltapine	G-522 DR
AgraTech	805 GW
Dekalb	DK 64BR*
AgraTech	GK802G
Northrup King	2660
Dekalb	DK 60
FFR	321 DR
Capehart	Contender

CENTRAL ALABAMA

<u>Brand name</u>	<u>Hybrid</u>
Capehart	Challenger
Northrup King	2660
AgraTech	GK802G
FFR	321 DR
Hy Performer	Cherokee
Dekalb	DK 60
AgraTech	805 GW
Deltapine	G-1711
AFC	861
Northrup King	Savanna 5*
Pioneer	8333

SOUTH ALABAMA

<u>Brand name</u>	<u>Hybrid</u>
Hy Performer	1330 DR
AgraTech	805 GW
AgraTech	GK 802G
AFC	861
Deltapine	G-522 DR
Capehart	Challenger
Pioneer	8333
Capehart	Contender
Deltapine	G-1711
FFR	321 DR
Hy Performer	Cherokee
Northrup King	2660
Northrup King	Savanna 5*
Hy Performer	Wings
Dekalb	DK 64BR*
Dekalb	DK 60

