

# *Performance of Grain Sorghum Hybrids in Alabama, 1991*



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

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# PERFORMANCE OF GRAIN SORGHUM HYBRIDS IN ALABAMA, 1991

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## INTRODUCTION

Grain sorghum performance tests are conducted annually throughout Alabama by the Alabama Agricultural Experiment Station. The number of test locations in 1991 was reduced to 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 performance 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 36-inch rows, 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.

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<sup>1</sup>Associate Professor, Professor, and Research Technician of Agronomy and Soils.

Time (days) to mid-bloom is one measure of relative maturity. 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 1991 it was decided to evaluate grain sorghum hybrids at only four locations, and to use bird control noise devices to help keep bird damage to a minimum at each test location. There was considerable bird damage at the Tennessee Valley Substation (Belle Mina) on a few of the early varieties in 1989. The test was discarded at this location in 1990 and also in 1991 despite the use of a bird alarm. Bird damage, which can be a problem in small fields, was only minor at the remaining locations in 1991. In selecting a hybrid, consideration should be given to bird populations; if damage is anticipated, bird-resistant hybrids should be used. Bird-resistant grain sorghum hybrids are sometimes difficult to market, however, they 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 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 is greater than the L.S.D. value between two

hybrids at a given location, 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 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 needs.

Anthracnose has become a major factor in grain sorghum production in Alabama, and there were sporadic outbreaks of this disease during the 1987 growing season, but none were observed in 1988, 1989, 1990, or 1991. In years prior to 1987, however, 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, Funk's 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 1989, 1990, or 1991 at any location. Plant height of grain sorghum hybrids is reported as location averages, table 5.

The rainfall during June and July in 1989 was good at all locations, resulting in good yields except where bird damage was a problem, table 6. However, rainfall in 1990 and 1991 during these 2 months was quite variable.



Table 1. Locations and Cultural Practices for the 1991 Grain Sorghum Hybrid Tests

Location	Planting date	Nitrogen <sup>1</sup> rate	Plant population	Harvest date	Herbicides	Insecticides
Tennessee Valley Substation (Belle Mina)	May 2	80	60,000	No harvest	Atrazine	None
Upper Coastal Plain Substation (Winfield)	April 24	80	60,000	September 26	Atrazine	None
Black Belt Substation (Marion Junction)	June 24	100	60,000	October 18	Atrazine	Lanate
Monroeville Experiment Field (Monroeville)	April 22	120	60,000	August 14 & 16	Atrazine	None

<sup>1</sup>Pounds per acre N. Lime, phosphorus, potassium, zinc, and sulfur were applied according to recommendation based on soil test.

TABLE 2. WINFIELD GRAIN SORGHUM HYBRID TRIAL, 1991

BRAND-HYBRID	1991	1990-91	1989-91	1991		
	YIELD	2-YR. AV.	3-YR. AV.	MID-	BIRD	LODGED
	BU.	BU.	BU.	MO./DAY	DAMAGE	STALKS
AFC 861	45	46	59	-	0.0	2.5
CAPEHART CHALLENGER	35	38	57	-	0.0	2.5
PIONEER 8333	39	40	56	-	0.0	0.0
FFR 321 DR	47	36	56	-	0.0	0.0
CAPEHART CONTENDER	45	37	55	-	0.0	2.5
DELTAPINE G-522 DR	50	39	55	-	0.0	0.0
DEKALB DK 60	42	33	54	-	0.0	2.5
AGRATECH GK802G	43	38	53	-	0.0	0.0
NORTHROP KING 2660	36	33	52	-	0.0	0.0
HY PERFORMER 1330 DR	41	35	52	-	0.0	2.5
DELTAPINE G-1711	34	35	52	-	0.0	0.0
PIONEER 8230	39	38	51	-	3.8	1.3
NORTHROP KING SAVANNA 5 *	42	41	50	-	0.0	1.3
HY PERFORMER 1225 DR	27	29	48	-	0.0	0.0
DEKALB DK 64	33	29	48	-	0.0	10.0
HY PERFORMER WINGS	32	35	47	-	0.0	6.3
HY PERFORMER CHEROKEE	36	36	47	-	0.0	12.5
PENN PENNGRAIN DR	40	35	39	-	0.0	0.0
AGRATECH 805GW	40	38	-	-	0.0	2.5
DEKALB DK 64BR *	28	24	-	-	0.0	2.5
CARGILL 837	52	-	-	-	0.0	2.5
DEKALB DK X967	49	-	-	-	0.0	0.0
CARGILL X27747	49	-	-	-	0.0	0.0
CARGILL X36113	44	-	-	-	0.0	1.3
DEKALB X-174	39	-	-	-	0.0	0.0
HY PERFORMER HONCHO	38	-	-	-	0.0	0.0
DEKALB X-176	38	-	-	-	0.0	0.0
NORTHROP KING KS 737	38	-	-	-	0.0	0.0
NORTHROP KING KS 710	38	-	-	-	0.0	0.0
DELTAPINE 1552	35	-	-	-	0.0	0.0
DEKALB DK 41Y	34	-	-	-	0.0	0.0
DEKALB DK 40Y	33	-	-	-	0.0	0.0
DEKALB DK 56	27	-	-	-	0.0	2.5
TEST MEAN	39					
L.S.D. (.05)	14.7					
C.V. (%)	26.9					

\* BIRD-RESISTANT HYBRID.

TABLE 3. MARION JUNCTION GRAIN SORGHUM HYBRID TRIAL, 1991

BRAND-HYBRID	1991	1990-91	1989-91	1991		
	YIELD	2-YR. AV.	3-YR. AV.	MID-	BIRD	LODGED
	BU.	BU.	BU.	MO./DAY	DAMAGE PCT.	STALKS PCT.
CAPEHART CHALLENGER	84	92	97	8/22	8.8	0.0
DELTAPINE G-1711	86	89	96	8/22	6.3	0.0
CAPEHART CONTENDER	79	92	96	8/21	3.8	0.0
NORTHRUP KING 2660	79	89	94	8/20	6.3	0.0
FFR 321 DR	76	86	93	8/22	5.0	0.0
HY PERFORMER CHEROKEE	95	88	92	8/21	2.5	0.0
AFC 861	70	83	91	8/23	8.8	0.0
HY PERFORMER 1225 DR	71	83	90	8/21	3.8	0.0
AGRATECH GK802G	84	88	90	8/22	3.8	0.0
DEKALB DK 60	74	80	90	8/28	7.5	0.0
DELTAPINE G-522 DR	78	85	87	8/22	8.8	0.0
PENN PENNGRAIN DR	77	83	86	8/21	5.0	0.0
NORTHRUP KING SAVANNA 5 *	53	74	86	8/25	1.3	0.0
HY PERFORMER 1330 DR	65	76	85	8/21	8.8	0.0
HY PERFORMER WINGS	69	74	84	8/23	10.0	0.0
PIONEER 8333	62	74	78	8/20	6.3	0.0
PIONEER 8230	68	78	77	8/20	6.3	0.0
DEKALB DK 64	53	60	71	8/25	20.0	0.0
AGRATECH 805GW	77	84	-	8/19	1.3	0.0
DEKALB DK 64BR *	41	56	-	8/22	0.0	0.0
DEKALB DK X967	83	-	-	8/26	3.8	0.0
CARGILL 837	82	-	-	8/24	8.8	0.0
CARGILL X36113	75	-	-	8/22	8.8	0.0
DEKALB X-174	74	-	-	8/27	12.5	0.0
DELTAPINE 1552	74	-	-	8/23	11.3	0.0
DEKALB DK 56	73	-	-	8/27	12.5	0.0
DEKALB X-176	72	-	-	8/27	12.5	0.0
NORTHRUP KING KS 737	66	-	-	8/20	8.8	0.0
NORTHRUP KING KS 710	65	-	-	8/19	3.8	0.0
CARGILL X27747	64	-	-	8/23	11.3	0.0
DEKALB DK 41Y	61	-	-	8/21	3.8	0.0
HY PERFORMER HONCHO	60	-	-	8/20	10.0	0.0
DEKALB DK 40Y	56	-	-	8/22	1.3	0.0
TEST MEAN	71					
L.S.D. (.05)	17.1					
C.V. (%)	17.2					

\* BIRD-RESISTANT HYBRID.

TABLE 4. MONROEVILLE GRAIN SORGHUM HYBRID TRIAL, 1991

BRAND-HYBRID	1991					
	1991	1990-91	1989-91	MID-	BIRD	LODGED
	YIELD	2-YR. AV.	3-YR. AV.	BLOOM	DAMAGE	STALKS
	BU.	BU.	BU.	MO./DAY	PCT.	PCT.
AFC 861	84	82	89	6/26	0.0	0.0
HY PERFORMER 1330 DR	84	83	89	6/24	0.0	1.3
DELTAPINE G-1711	85	83	89	6/25	0.0	0.0
DEKALB DK 60	82	81	88	7/1	0.0	0.0
FFR 321 DR	83	78	87	6/25	0.0	0.0
DEKALB DK 64	73	75	86	6/28	0.0	0.0
DELTAPINE G-522 DR	78	77	86	6/24	0.0	0.0
HY PERFORMER CHEROKEE	84	77	86	6/25	0.0	0.0
NORTHRUP KING SAVANNA 5 *	82	75	84	6/24	0.0	0.0
CAPEHART CHALLENGER	86	80	84	6/24	0.0	0.0
CAPEHART CONTENDER	83	78	83	6/24	0.0	0.0
PENN PENNGRAIN DR	85	78	82	6/24	0.0	0.0
NORTHRUP KING 2660	80	76	82	6/24	0.0	0.0
PIONEER 8230	85	76	82	6/25	0.0	0.0
PIONEER 8333	83	81	82	6/25	0.0	0.0
AGRATECH GK802G	86	81	81	6/24	0.0	0.0
HY PERFORMER WINGS	67	73	80	6/26	0.0	0.0
HY PERFORMER 1225 DR	77	74	77	6/24	0.0	0.0
AGRATECH 805GW	82	85	-	6/26	0.0	0.0
DEKALB DK 64BR *	78	67	-	6/22	0.0	0.0
DEKALB X-176	98	-	-	6/29	0.0	0.0
DELTAPINE 1552	97	-	-	6/28	0.0	0.0
DEKALB X-174	90	-	-	6/29	0.0	0.0
CARGILL X27747	88	-	-	6/25	0.0	0.0
CARGILL 837	87	-	-	6/27	0.0	0.0
DEKALB DK 56	84	-	-	6/29	0.0	0.0
CARGILL X36113	83	-	-	6/24	0.0	0.0
DEKALB DK 41Y	81	-	-	6/30	0.0	0.0
NORTHRUP KING KS 737	74	-	-	6/24	0.0	0.0
HY PERFORMER HONCHO	74	-	-	6/24	0.0	0.0
DEKALB DK 40Y	74	-	-	6/25	0.0	0.0
DEKALB DK X967	71	-	-	7/1	0.0	0.0
NORTHRUP KING KS 710	69	-	-	6/22	0.0	0.0
TEST MEAN	82					
L.S.D. (.05)	10.0					
C.V. (%)	8.7					

\* BIRD-RESISTANT HYBRID.

TABLE 5. PLANT HEIGHT OF GRAIN SORGHUM HYBRIDS BY LOCATION, 1991

BRAND-HYBRID	PLANT HEIGHT BY LOCATION		
	WINFIELD	MARION JUNCTION	MONROEVILLE
	IN.	IN.	IN.
AFC 861	47	41	49
AGRATECH GK802G	41	41	46
AGRATECH 805GW	47	42	49
CAPEHART CHALLENGER	45	43	49
CAPEHART CONTENDER	42	40	47
CARGILL X27747	51	50	50
CARGILL X36113	46	40	49
CARGILL 837	47	41	49
DEKALB DK X967	44	40	47
DEKALB DK 40Y	41	36	46
DEKALB DK 41Y	47	39	49
DEKALB DK 56	46	44	50
DEKALB DK 60	46	47	51
DEKALB DK 64	48	48	50
DEKALB DK 64BR *	57	59	54
DEKALB X-174	49	53	52
DEKALB X-176	49	47	54
DELTAPINE G-1711	44	44	49
DELTAPINE G-522 DR	40	41	48
DELTAPINE 1552	46	50	51
FFR 321 DR	41	39	46
HY PERFORMER CHEROKEE	47	45	46
HY PERFORMER HONCHO	41	37	43
HY PERFORMER WINGS	44	40	47
HY PERFORMER 1225 DR	41	41	46
HY PERFORMER 1330 DR	50	50	54
NORTHRUP KING KS 710	40	31	42
NORTHRUP KING KS 737	45	43	48
NORTHRUP KING SAVANNA 5 *	55	55	56
NORTHRUP KING 2660	40	40	46
PENN PENNGRAIN DR	45	38	46
PIONEER 8230	48	43	47
PIONEER 8333	45	36	45

\* BIRD-RESISTANT HYBRID.

Table 6. Growing Season Rainfall, 1989-91

Test location	Year	Monthly rainfall							7 months total
		Mar.	Apr.	May	June	July	Aug.	Sept.	
-----inches-----									
Belle Mina	1989	5.6	3.2	3.9	13.5	5.1	2.8	3.9	37.9
	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
Winfield	1989	5.0	3.8	4.5	8.3	7.3	3.3	5.7	37.9
	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
Marion Junction	1989	7.3	5.5	1.9	9.3	5.7	1.3	1.5	32.5
	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
Monroeville	1989	7.0	8.2	3.6	13.4	7.3	1.7	4.5	45.7
	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

Sources of Seed for the 1991 Grain Sorghum Tests

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
Cargill brand hybrids.....	Cargill Hybrid Seeds Box 5645 Minneapolis, MN 55440
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 5100 Poplar Avenue Memphis, TN 38137
Northrup King brand hybrids.....	Northrup King Company Rt. 3 Box 265 LaGrange, NC 28551
Pennington brand hybrids.....	Pennington Enterprises, Inc. P.O. Box 290 Madison, GA 30650
Pioneer brand hybrids.....	Pioneer Hi-Bred International, Inc. 1000 West Jefferson Street Tipton, IN 46072



ACCEPTABLE HYBRIDS FOR 1992

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.

NORTHERN ALABAMA

<u>Brand name</u>	<u>Hybrid</u>
AFC	861
Capehart	Challenge
Pioneer	8333
FFR	321 DR
Capehart	Contender
Deltapine	G-522 DR
DeKalb	DK 60
AgraTech	GK 802G
Northrup King	2660
Hy Performer	1330 DR
Deltapine	G-1711
Northrup King	Savanna 5*
Hy Performer	1225 DR**
Hy Performer	Wings**

CENTRAL ALABAMA

<u>Brand name</u>	<u>Hybrid</u>
Capehart	Challenger
Deltapine	G-1711
Capehart	Contender
Northrup King	2660
FFR	321 DR
Hy Performer	Cherokee
AFC	861
Hy Performer	1225 DR
AgraTech	GK 802G
DeKalb	DK 60
Northrup King	Savanna 5*

SOUTHERN ALABAMA

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

\*Bird-resistant hybrid.

\*\*If the present trend of these varieties continues, they will be dropped.

\*\*\*Recommended on basis of exceptional 2-year average.



