



# The Agriculture Program

The Texas A&M University System

## 2003 Texas Panhandle Forage Sorghum Silage Trial

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### Introduction

Many cropping systems throughout Texas involve forage sorghum or sorghum-sudangrass hybrids grown for grazing, hay, or silage production. The potential for increasing acreage planted to these forages exist due to the recent development of new brown midrib and photoperiod sensitive hybrids. In the Texas Panhandle the cattle industry is primarily centered around stocker cattle grazing systems and confined cattle feeding. Both of these segments utilize hay and silage in their feeding operations. Additional demand for quality hay and silage is coming from the budding dairy industry in the Panhandle. Corn silage has long served the region well, producing consistent high quality silage. However, many areas of the Panhandle no longer have the irrigation capacity to successfully produced corn silage. Our research since 1999 has consistently shown that quality sorghum silage can be successfully produced using 40% less water than is required for corn silage. However, unlike corn, large differences exist in types of sorghums, and even between hybrids within types, in terms of forage and grain yield, lodging potential, and nutritional quality. In choosing a sorghum hybrid to plant or feed it is critical to know the agronomic and nutritional characteristics of specific hybrids. This trial as well as those conducted in previous years attempts to provide a summary of those characteristics that should be considered when choosing a sorghum hybrid for hay or silage production.

### Methods and Materials

The trial was made up of 92 hybrids provided by seed companies. Several male sterile hybrids were included. These were all capable of producing grain due to cross-pollination that occurred in the field with other hybrids. Seed companies will provide pollinator seed for male sterile hybrids if desired. The hybrids were planted in a randomized block design in four row plots planted on 30-inch raised beds. Irrigation was applied by furrow. Irrigation scheduling was determined by monitoring gypsum blocks placed in the soil at depths of 1, 2, and 3 feet. Moisture blocks were read every two to three days and plots were irrigated when the average of the three moisture blocks fell below 60. A total of 22.2 inches of water was applied during the season along with a pre-irrigation of 4.0 inches. Rainfall totaled 8.8 inches during the growing season (May 21 – September 31). Each hybrid was harvested when grain reached the soft dough stage. Photoperiod sensitive hybrids were harvested on the last harvest date of the season. Other cultural practices and study information are listed below:

Trial Location:	Bush farm located one mile north of Bushland, TX.
Cooperator:	Texas Agricultural Experiment Station
Previous Crop:	Wheat
Soil Type:	Pullman Clay Loam, pH = 7.4

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Plot Size: Four, 30 inch rows by 25 ft.  
 Replications: 3  
 Study Design: Randomized complete block  
 Planting Date: May 21, 2003  
 Planting Rate: 120,000 seed/acre  
 Seed Method: John Deere Max-emerge Planter  
 Soil Moisture: Study was pre-irrigated (4 inches)  
 Fertilizer: 210 lbs/acre N and 50 lbs P205  
 Herbicide: One lb/acre atrazine applied immediately after planting  
 Irrigation: Furrow irrigated based on moisture block readings. A total of 22.2 inches applied during the growing season.  
 Silage Harvest Date: Plots were checked weekly and harvested when grain was in the soft dough stage. Harvest dates ranged from September 5 to October 15 and are reported in Table 2.  
 Grain Harvest Date: October 29

Data Collected:

- Plant height (ft) at silage harvest.
- Lodging at silage harvest. Percent of fallen or significantly leaning plants per plot.
- Silage yield. Collected at or near the soft dough stage from 10 feet of row. Yield is reported at 65% moisture in tons/acre.
- Nutrient analysis: Whole plant subsamples were collected from the yield sample immediately after harvest, chopped, and frozen. These subsamples were sent to Dairy One Laboratory, Ithaca, NY for analysis. All nutrient constituents were adjusted to a 100% moisture-free basis.
- Grain yield was collected from 10 feet of row from each plot. Samples were thrashed and yield reported in lb/acre. No moisture correction was made.
- Nutrient Analysis Definitions
  - Crude Protein:**  $6.25 * \% \text{ total nitrogen}$ .
  - C. Protein/ac:** Crude protein\*forage yield (lbs DM/ac).
  - TDN:** Estimate of total digestible nutrients
  - NDF:** Neutral detergent fiber; cell wall fraction of the forage.
  - ADF:** % acid detergent fiber; constituent of the cell wall includes cellulose and lignin; inversely related to energy availability.
  - IVTD:** % in vitro true digestibility; positively related to energy availability.
  - NEl:** Estimate of Net Energy for lactation.
  - NE<sub>m</sub>:** Estimate of Net Energy for maintenance.
  - NE<sub>g</sub>:** Estimate of Net Energy for gain.
  - P:** % Phosphorus.
  - P/ac:** %P \* forage yield (lbs DM/ac); reported because of interest in crops that will remove P from soils fertilized with livestock manure.
  - IVTD/ac:** %IVTD \* forage yield (lbs DM/ac).

**Corn Silage Trial (Methods and Materials)**

Three corn hybrids were planted adjacent to the sorghum silage trial for comparison. Maturity of corn hybrids ranged from 114 to 119 CRM. Prior to planting 210 lb/acre of N and 50 lb/acre of P205 were applied. Each hybrid was planted on May 8 in a 200 ft strip on four 30-inch rows at

34,000 seed/acre. Bicep II Magnum was applied immediately after planting at 1.6 qt/acre for weed control. Plots were irrigated based on gypsum block readings at soil depths of 1, 2, and 3 feet. Total in-season irrigation water applied was 37.3 inches. Similar to the sorghum, 4.0 inches of irrigation water was applied prior to planting due to the dry spring. Four samples were collected from each hybrid plot (strip) for yield and nutrient composition determination when each hybrid's milkline had advanced 1/2 to 2/3 of the way down the kernel.

## Results and Discussion

A summary of yield, important agronomic traits, and nutrient composition are reported by groups of different sorghum and sorghum/sudan types along with corn in Table 1. See Table 2 for a listing of each hybrid's agronomy characteristics, yield, and nutrient composition. Overall forage yield was down considerably compared to 2002. Forage yield test average was 19.8 ton/ac in 2003 compared to 28.6 and 25.5 ton/ac in 2002 and 2001, respectively (Table 1). The drop in yield was consistent across all sorghum types. The reason for the lower yield can likely be attributed to the hot, dry weather experienced from the end of June through mid-August even though considerable amounts of irrigation water (15.6 inches) was applied during this time. Later maturing hybrids that typically yield more were stressed late in the season since we were unable to irrigate after September 5 when harvest was initiated in the early maturing hybrids. Since all plots were harvested by hand, beds were destroyed getting in and out of the plots preventing us from irrigating from that day forward. In 2002 an abundance of rain occurred in late August and in September (3.6 inches) resulting in excellent yields of the late maturing sorghums.

Table 1. Summary of key characteristics by sorghum type and corn.

Sorghum Type <sup>1)</sup>	Plant ht. (ft)	% Lodging @ harvest	% Moist. @ harvest	Tons/ac @ 65% Moist.	IWUE <sup>2)</sup> , ton/ac-in	Grain Yield, lb/ac	% Crude Protein	% ADF	% NDF	% TDN	% Lignin	% IVTD	IVTD lbs/ac
F. Sorghum Non-BMR (32)	7.0	4.2	64.9	21.4	1.0	4791	6.7	27.8	46.0	61.3	4.4	75.7	11,252
F. Sorghum BMR (23)	7.3	14.4	67.4	16.9	0.8	3039	7.5	25.7	43.6	66.3	3.1	80.8	9,544
F. Sorghum Non-BMR PS (4)	10.0	6.3	67.0	26.9	1.2	0	5.3	36.5	61.9	53.9	5.1	70.7	13,340
F. Sorghum BMR PS (1)	10.2	1.7	71.0	25.1	1.1	0	5.8	35.4	59.3	61.3	4.1	79.0	13,880
Sorg/Sudan Non-BMR (10)	8.5	9.5	63.2	15.7	0.7	539	8.0	28.4	47.4	61.1	4.9	74.6	8,211
Sorg/Sudan BMR (4)	7.4	23.8	65.7	14.9	0.7	1542	8.3	27.2	46.7	62.0	4.2	76.8	7,989
Sorg/Sudan Non-BMR PS (4)	10.5	0.0	67.5	22.9	1.0	0	4.7	36.6	59.4	51.3	5.3	68.3	10,948
Sorg/Sudan BMR PS (7)	10.0	1.9	67.8	23.2	1.0	439	5.9	33.6	55.8	56.0	4.4	72.2	11,716
Sudan (2)	8.3	20.8	64.5	17.0	0.8	383	7.4	30.0	48.3	60.0	4.6	74.5	8,873
Grain Sorghum (6)	3.5	0.0	55.8	14.1	0.6	5542	8.7	21.0	36.1	69.4	3.1	81.9	8,065
Test Avg.	8.3	8.3	65.5	19.8	0.9	1627.6	6.8	30.2	50.4	60.3	4.3	75.5	10,382
<b>Corn (3)</b>		0.0	62.5	25.5	0.6	11,280	7.5	20.8	36.3	73.7	2.8	84.2	15,030

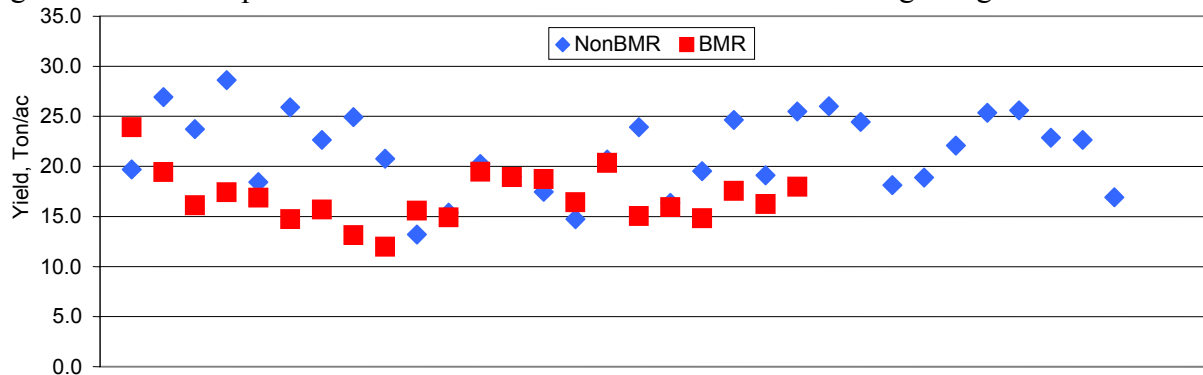
<sup>1)</sup>Number in parenthesis is the number of hybrids that make up each sorghum or corn type. BMR = Brown midrib, PS = Photoperiod sensitive.

<sup>2)</sup>IWUE = Irrigation water use efficiency. Tons of forage produced per inch of applied in-season irrigation water.

Tons of forage produced per acre-inch of irrigation water applied in-season (IWUE) was less than observed in previous years. This was directly related to our lower yields in 2003 and the lack of significant rainfall which resulted in a higher percentage of the total water used by the sorghum coming from irrigation. In 2003, 22.2 inches of in-season irrigation water was applied to the sorghum and 37.7 inches to the corn. Irrigation water use efficiency was highest with the photoperiod sensitive forage sorghums and lowest with the grain sorghum and corn hybrids (Table 1).

Another contrast to 2001 and 2002 was the reduced yield of the brown midrib (BMR) forage sorghums compared to the non-BMR forage sorghums. In 2001 and 2002 the BMR forage sorghums yielded approximately 9.5% less than the non-BMR forage sorghums. In contrast, in this year's study the BMR forage sorghums yielded 21% less than the non-BMRs (Table 1). Only two BMR hybrids yielded above 20 ton/acre while the majority of the non-BMR forage sorghums yielded greater than 20 ton/acre (Figure 1).

Figure 1. Yield comparison of brown midrib vs. non-brown midrib forage sorghums in 2003.



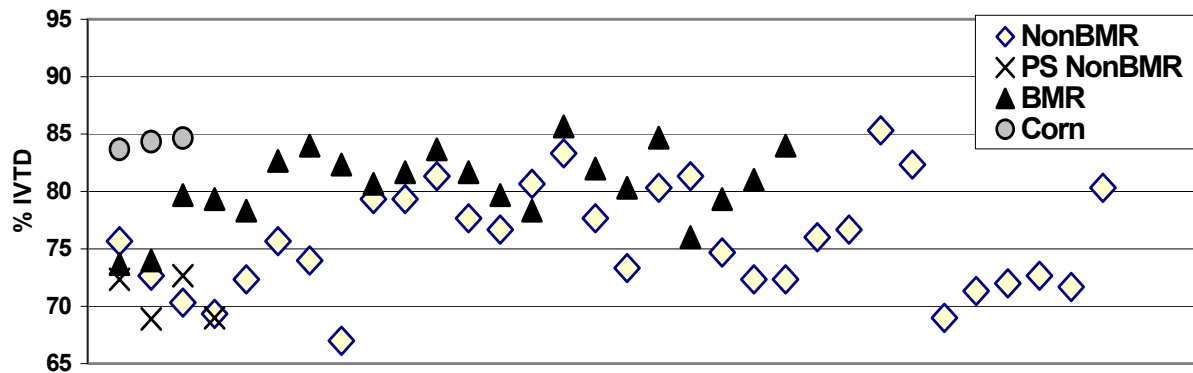
Similar to previous years the photoperiod sensitive (PS) hybrids produced the most forage with the non-BMR forage sorghums averaging 26.9 ton/acre (Table 1). Since the photoperiod sensitive hybrids normally do not produce grain they were harvested when the late maturing grain producing hybrids in the trial reached soft dough. This occurred on October 15 in 2003. A problem in previous years with the photoperiod sensitive hybrids has been the high moisture content at harvest, averaging over 75% moisture in 2002. This year average moisture content of the non-BMR PS forage sorghums was 67.4%. The lower moisture content can likely be attributed to the lack of late season irrigation and rainfall causing the sorghum to be drier at harvest than in previous years.

Lodging was highest with the BMR sorghums (Table 1). Of the 23 BMR forage sorghums tested, 11 had lodging scores of 10% or greater (Table 2). In contrast, only 5 of the 32 non-BMR forage sorghums had lodging scores of 10% or greater. In general, lodging did not increase in 2003 compared to previous years even though 210 lbs of nitrogen was applied preplant. This again was likely do to lack of significant rainfall or irrigation late in the season which tends to promote lodging.

Analysis of plant nutrient composition suggests that the BMR mutation improved nutritional quality. Compared to non-BMR hybrids, lignin content and ADF were lower for the BMR types which resulted in increased IVTD and TDN. Figure 2 illustrates individual hybrid in vitro

digestibilities. Hybrids containing the BMR mutation, on average, had higher digestibilities compared to hybrids of the same type without the BMR trait. It is important to note that individual hybrids, both with and without the BMR mutation, had digestibilities similar to corn. The photoperiod sensitive varieties have a lower digestibility compared to other hybrids, possibly as a result of higher lignin content. Lignin is an indigestible component of plant material that helps provide strength and rigidity. From a nutritional standpoint, reduced lignin content can increase the digestibility of a forage, allowing more energy to be available for utilization by the animal consuming the forage. BMR genotypes have less lignification than non-BMR types; consequently, digestibility is increased.

Figure 2. In vitro digestibilities of corn and Non-BMR, PS Non-BMR, and BMR forage sorghums in 2003.



Grain yield is often perceived to be positively related to the digestibility of a silage; however, the type of forage grown also influences digestibility. Several sorghum hybrids had digestibilities similar to corn but with less grain production (Figure 3). BMR varieties are more digestible at the same level of grain production when compared to non-BMR varieties. A slight upward trend in digestibility of BMR varieties occurred when grain yield increased, but the non-BMR varieties were not affected by grain content. Forage sorghum yield negatively effected digestibility (Figure 4). The BMR types tended to yield less, but maintained a higher digestibility; whereas the non-BMR and PS types continued to decrease in digestibility as yield increased. Corn maintained a high digestibility and yield, resulting in more lbs/ac of digestible material than the sorghum types.

Figure 3. In vitro digestibility compared to grain yield for corn and Non-BMR, PS Non-BMR, and BMR forage sorghums in 2003.

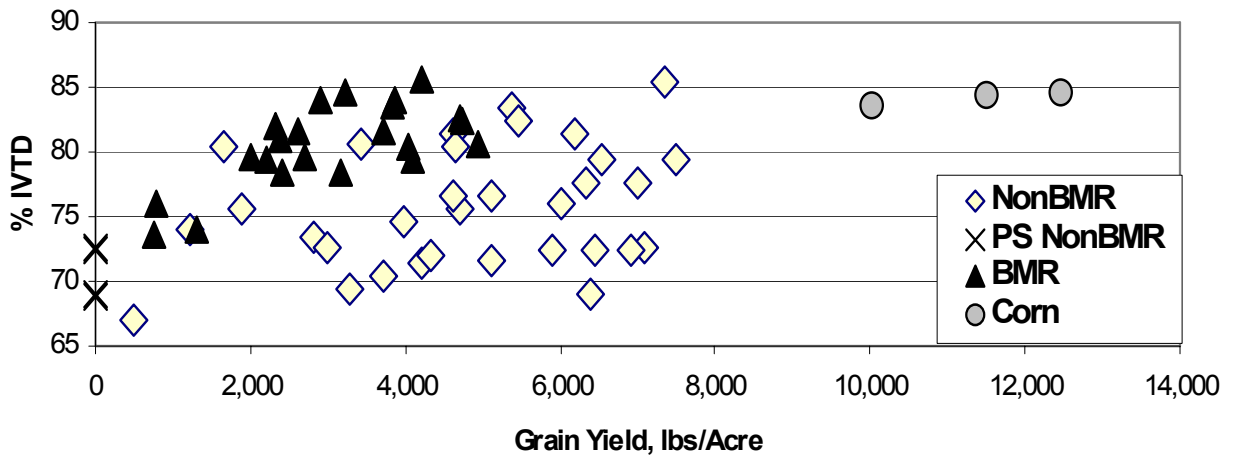
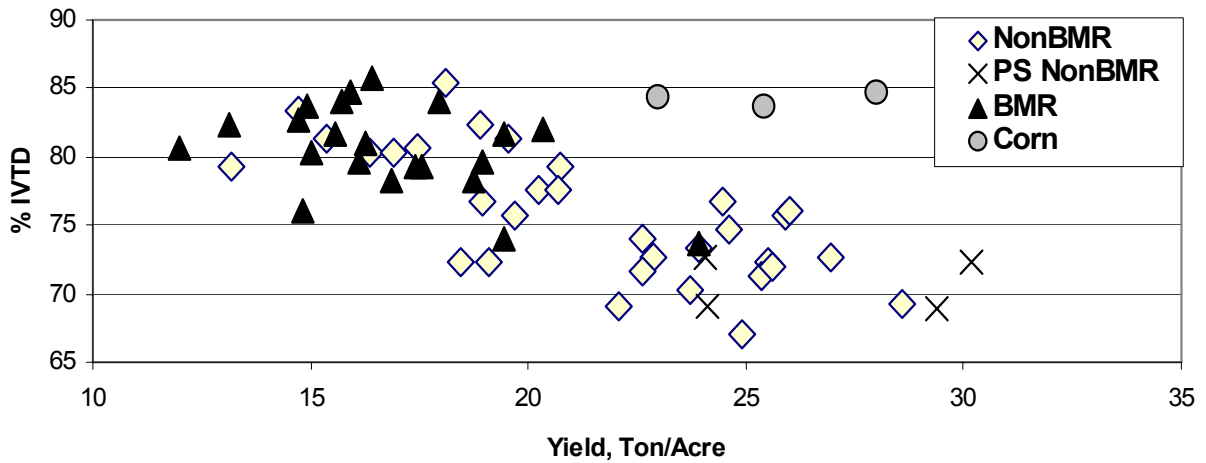


Figure 4. In vitro digestibility compared to forage yield for corn and Non-BMR, PS Non-BMR, and BMR forage sorghums in 2003.



**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>					Agronomic Information at Forage Harvest <sup>2)</sup>										
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	Harvest Date	% Moisture		% Lodging		Height, ft.		Tons/ac @ 65% Moist.		Grain Yield, lb/ac	
1	Sweet Choice BMR	F. Sorghum	ML	Y	Y	22-Sep	67.7	a-h	3.3	fgh	6.3	r-z	19.5	c-y	2,616	o-D
2	Sweet King BMR	Sorghum/Sudan	ML	Y	Y	5-Sep	69.1	a-f	36.7	bcd	7.7	j-t	17.2	f-A	2,171	q-D
3	775W	Grain Sorghum	M	N	N	5-Sep	53.3	op	0.0	h	3.1	C	8.4	A	4,105	e-u
4	Tridan	Sorghum/Sudan	ML	N	N	5-Sep	62.5	b-o	3.3	fgh	9.5	a-i	14.8	r-A	480	A-D
5	Cadan 10/10	Sorghum/Sudan	ML	N	N	22-Sep	59.6	f-p	8.3	e-h	9.0	b-l	12.3	x-A	279	BCD
6	Cadan 99B	Sorghum/Sudan	ML	N	N	5-Sep	60.0	f-p	5.0	e-h	9.7	a-h	17.2	f-A	551	z-D
7	Challenger	Grain Sorghum	ME	N	N	12-Sep	58.9	g-p	0.0	h	3.7	BC	13.5	u-A	5,809	a-l
8	Challenger E	Grain Sorghum	ME	N	N	5-Sep	53.9	nop	0.0	h	3.2	C	8.5	zA	4,039	e-u
9	Silage Master	F. Sorghum	ML	N	N	1-Oct	65.8	a-k	10.0	e-h	9.0	b-l	24.6	a-n	3,966	e-u
10	URON	Sorghum/Sudan	ML	N	N	5-Sep	62.9	a-o	1.7	gh	10.0	a-f	15.3	o-A	439	A-D
11	Maxi Gain	Sorghum/Sudan	PS	N	N	15-Oct	68.3	a-g	0.0	h	10.2	a-e	21.3	a-x	0	D
12	Sugar Graze Ultra	Sorghum/Sudan	PS	N	N	15-Oct	67.8	a-g	0.0	h	10.5	abc	23.9	a-r	0	D
13	Sugar Graze 2000	Sorghum/Sudan	L	N	N	15-Oct	66.1	a-j	0.0	h	9.8	a-g	20.3	b-y	554	z-D
14	GW 3072F	F. Sorghum	M	N	N	1-Oct	64.1	a-m	0.0	h	5.2	yzA	20.8	b-y	7,495	a
15	GW 9530F	F. Sorghum	ML	N	Y	12-Sep	68.2	a-g	1.7	gh	6.7	p-y	16.9	f-A	4,637	c-q
16	DSS Dividend BMR	F. Sorghum	ML	Y	N	22-Sep	68.6	a-g	26.7	c-f	7.2	m-w	18.9	e-y	2,000	r-D
17	DSS Bonus BMR	Sorghum/Sudan	PS	Y	N	15-Oct	65.4	a-l	0.0	h	10.2	a-e	22.2	a-w	1,240	w-D
18	DSS Bonus-R BMR	Sorghum/Sudan	PS	Y	N	15-Oct	68.0	a-g	3.3	fgh	10.2	a-e	20.6	b-y	498	A-D
19	Silmaker 6000	F. Sorghum	M	N	N	5-Sep	69.9	a-e	0.0	h	4.5	ABC	13.2	w-A	6,523	a-e
20	Silmaker 6500	F. Sorghum	ML	N	N	15-Oct	66.1	a-j	0.0	h	5.7	v-A	19.1	e-y	6,450	a-g
21	Silmaker 7000	F. Sorghum	L	N	N	1-Oct	67.1	a-j	6.7	e-h	7.0	n-x	19.7	c-y	4,696	c-q
22	992003 bmr	F. Sorghum	M	Y	N	12-Sep	68.7	a-f	40.0	a-d	6.3	r-z	16.1	l-A	2,695	o-C
23	991005 bmr	F. Sorghum	M	Y	N	12-Sep	68.3	a-g	11.7	e-h	6.5	q-z	17.4	f-A	4,098	e-u
24	22053 bmr	Sorghum/Sudan	PS	Y	N	15-Oct	62.1	c-o	0.0	h	10.3	a-d	26.1	a-f	904	x-D
25	Garst 325	F. Sorghum	L	N	N	15-Oct	65.2	a-l	0.0	h	5.7	v-A	26.9	a-e	7,098	abc
26	Garst Hi-Energy II	F. Sorghum	L	N	N	15-Oct	61.8	c-o	5.0	e-h	8.8	c-m	23.7	a-s	3,727	h-w
27	Garst BMR 344	F. Sorghum	ML	Y	N	22-Sep	67.1	a-j	41.7	abc	7.8	i-s	18.7	e-y	2,417	p-D
28	Garst BMR 348	F. Sorghum	ML	Y	N	22-Sep	66.1	a-j	5.7	e-h	8.5	e-o	16.4	j-A	4,205	e-t
29	Garst N-322-X	F. Sorghum	ML	N	N	15-Oct	56.1	k-p	0.0	h	5.3	x-A	25.5	a-j	6,907	a-d
30	Garst 331-X	F. Sorghum	ML	N	N	15-Oct	57.5	i-p	0.0	h	5.8	u-A	26.0	a-g	6,013	a-j
31	Garst N765 BMR-X	Sorghum/Sudan	PS	Y	N	15-Oct	66.7	a-j	3.3	fgh	10.0	a-f	20.3	b-y	432	A-D
32	Garst R723BMR-X	Sorghum/Sudan	PS	Y	N	15-Oct	68.8	a-f	0.0	h	9.8	a-g	28.4	a-d	0	D
33	MMR 366/70BMR	Sorghum/Sudan	PS	Y	N	15-Oct	72.0	ab	6.7	e-h	10.0	a-f	24.0	a-q	0	D
34	MMR 366/23BMR	F. Sorghum	ML	Y	N	22-Sep	67.2	a-i	6.7	e-h	8.3	f-p	20.4	b-y	2,312	p-D
35	MMR 366/36BMR	F. Sorghum	L	Y	Y	15-Oct	67.5	a-h	50.0	ab	10.0	a-f	23.9	a-r	745	y-D
36	MMR 366/35BMR	F. Sorghum	ML	Y	N	12-Sep	67.6	a-h	21.7	c-h	6.7	p-y	15.0	p-A	4,025	e-u

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>					Agronomic Information at Forage Harvest <sup>2)</sup>										
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	Harvest Date	% Moisture		% Lodging		Height, ft.	Tons/ac @ 65% Moist.		Grain Yield, lb/ac		
37	DeKalb FS-5	F. Sorghum	ML	N	N	22-Sep	63.2	a-n	0.0	h	7.2	m-w	24.4	a-o	4,607	c-r
38	DeKalb FS-25E	F. Sorghum	L	N	N	15-Oct	63.3	a-n	5.0	e-h	8.7	d-n	28.6	abc	3,281	k-y
39	DeKalb DKS 59-09	F. Sorghum	ML	N	N	22-Sep	65.4	a-l	0.0	h	5.3	x-A	18.1	e-y	7,350	ab
40	4 Ever Green	F. Sorghum	PS	N	N	15-Oct	68.1	a-g	10.0	e-h	10.2	a-e	30.2	a	0	D
41	4 Ever Green BMR	F. Sorghum	PS	Y	N	15-Oct	71.0	a-d	1.7	gh	10.2	a-e	25.1	a-l	0	D
42	Millennium BMR	F. Sorghum	ML	Y	N	12-Sep	70.3	a-e	10.0	e-h	7.7	j-t	15.9	m-A	3,211	l-y
43	Century BMR	F. Sorghum	ML	Y	N	5-Sep	63.5	a-n	3.3	fgh	8.0	h-r	14.8	r-A	785	y-D
44	NC+ Nutri-Cane II	F. Sorghum	ML	N	Y	12-Sep	67.5	a-h	0.0	h	6.8	o-y	18.9	e-y	5,457	a-m
45	NC+ Nutri-Choice II	F. Sorghum	ML	N	N	15-Oct	61.6	d-o	0.0	h	5.8	u-A	22.1	a-w	6,400	a-g
46	NC+ Nutri-Ton II	F. Sorghum	ML	N	N	15-Oct	60.9	e-o	1.7	gh	7.3	l-v	25.4	a-k	4,220	e-t
47	811F	F. Sorghum	PS	N	N	15-Oct	64.9	a-l	1.7	gh	9.5	a-i	29.4	ab	0	D
48	979	Sorghum/Sudan	ML	N	Y	5-Sep	68.7	a-f	8.3	e-h	6.5	q-z	15.7	n-A	871	x-D
49	Nutri+Plus BMR	Sorghum/Sudan	ML	Y	N	5-Sep	69.2	a-f	25.0	c-g	8.0	h-r	13.5	v-A	1,724	s-D
50	Red+Top Plus BMR	F. Sorghum	ML	Y	Y	1-Oct	66.5	a-j	6.7	e-h	6.2	s-A	17.6	f-z	2,207	q-D
51	Silo+Plus BMR	F. Sorghum	ML	Y	N	12-Sep	64.8	a-l	10.0	e-h	6.5	q-z	16.2	k-A	2,371	p-D
52	MS505 DS BMR X	Sorghum/Sudan	ME	Y	N	5-Sep	67.2	a-i	28.3	cde	7.3	l-v	12.1	yzA	1,522	u-D
53	Silo 700D	F. Sorghum	L	N	N	15-Oct	65.0	a-l	0.0	h	5.8	u-A	18.4	e-y	5,903	a-k
54	Bundle King BMR	F. Sorghum	L	Y	Y	15-Oct	64.9	a-l	11.7	e-h	9.3	a-j	19.4	d-y	1,315	v-D
55	Dairy Master BMR	F. Sorghum	ML	Y	N	12-Sep	68.0	a-g	8.3	e-h	7.7	j-t	18.0	e-y	2,892	m-B
56	Pacesetter BMR	Sorghum/Sudan	PS	Y	N	15-Oct	71.5	abc	0.0	h	9.8	a-g	20.6	b-y	0	D
57	Canex	F. Sorghum	ME	N	Y	5-Sep	67.5	a-h	0.0	h	6.3	r-z	17.5	f-A	3,430	j-x
58	Canex BMR208	F. Sorghum	ME	Y	N	5-Sep	69.3	a-f	8.3	e-h	6.7	p-y	13.1	w-A	4,741	b-q
59	Canex BMR310	F. Sorghum	ME	Y	N	5-Sep	71.3	a-d	5.0	e-h	6.3	r-z	12.0	yzA	4,934	a-p
60	Canex BMR248	F. Sorghum	ME	Y	N	5-Sep	68.6	a-g	1.7	gh	7.2	m-w	15.6	n-A	3,706	i-w
61	Canex BMR340	F. Sorghum	ME	Y	N	12-Sep	63.7	a-m	8.3	e-h	6.5	q-z	14.9	q-A	3,831	g-w
62	Fame	F. Sorghum	ME	N	N	5-Sep	67.4	a-h	0.0	h	5.5	w-A	14.7	s-A	5,386	a-n
63	FS 515HQ	F. Sorghum	ME	N	N	15-Oct	62.1	c-o	0.0	h	5.2	yzA	20.7	b-y	6,341	a-h
64	FS 555	F. Sorghum	ME	N	N	15-Oct	64.4	a-m	26.7	c-f	9.2	a-k	23.9	a-r	2,805	n-C
65	FS 575	F. Sorghum	L	N	N	15-Oct	65.6	a-l	1.7	gh	10.2	a-e	25.9	a-h	1,892	s-D
66	Sug-R-Cane	F. Sorghum	M	N	Y	12-Sep	70.0	a-e	18.3	d-h	6.0	t-A	15.4	o-A	6,178	a-i
67	BMR 100	F. Sorghum	M	Y	N	12-Sep	67.9	a-g	23.3	c-h	7.0	n-x	16.9	h-A	3,178	m-z
68	BMR 106	F. Sorghum	M	Y	N	5-Sep	67.9	a-g	11.7	e-h	6.3	r-z	14.7	s-A	4,694	c-q
69	NK 300	F. Sorghum	M	N	N	22-Sep	65.0	a-l	0.0	h	4.8	zAB	20.3	b-y	7,000	abc
70	SS 405	F. Sorghum	L	N	N	1-Oct	68.1	a-g	25.0	c-g	10.0	a-f	22.6	a-u	1,233	w-D
71	SS 506	F. Sorghum	L	N	N	15-Oct	64.7	a-l	3.3	fgh	10.8	a	24.9	a-m	500	A-D
72	1990	F. Sorghum	PS	N	N	15-Oct	65.7	a-l	3.3	fgh	10.2	a-e	24.1	a-p	0	D



**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>					Agronomic Information at Forage Harvest <sup>2)</sup>						
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	Harvest Date	% Moisture	% Lodging	Height, ft.	Tons/ac @ 65% Moist.	Grain Yield, lb/ac	
73	HIKANE II	F. Sorghum	M	N	N	5-Sep	71.0 a-d	3.3 fgh	7.7 j-t	19.0 e-y	5,106 a-o	
74	Sordan 79	Sorghum/Sudan	M	N	N	5-Sep	67.4 a-h	56.7 a	9.0 b-l	16.5 i-A	778 y-D	
75	Sordan Headless	Sorghum/Sudan	PS	N	N	15-Oct	65.5 a-l	0.0 h	10.5 abc	24.2 a-p	0 D	
76	Trudan 8	Sudangrass	M	N	N	12-Sep	64.1 a-m	41.7 abc	6.7 p-y	11.6 yzA	766 y-D	
77	Trudan Headless	Sudangrass	PS	N	N	15-Oct	64.9 a-l	0.0 h	9.8 a-g	22.4 a-v	0 D	
78	2-Way 199PS	F. Sorghum	PS	N	N	15-Oct	69.3 a-f	10.0 e-h	10.3 a-d	24.1 a-p	0 D	
79	2-Way BMR	F. Sorghum	M	Y	N	22-Sep	67.6 a-h	1.7 gh	7.7 j-t	15.7 n-A	3,874 f-v	
80	2-Way SRS	F. Sorghum	ML	N	N	15-Oct	61.8 c-o	8.3 e-h	8.8 c-m	25.6 a-i	4,325 d-s	
81	2-Way	F. Sorghum	ML	N	N	15-Oct	63.7 a-m	10.0 e-h	9.0 b-l	22.9 a-t	2,997 m-A	
82	Sweet Bee	F. Sorghum	ME	N	N	5-Sep	72.5 a	5.0 e-h	7.5 k-u	16.4 j-A	1,664 t-D	
83	Sweet Bee Sterile II	F. Sorghum	ME	N	Y	12-Sep	66.3 a-j	0.0 h	6.5 q-z	19.5 c-y	4,617 c-r	
84	2-Way F103	F. Sorghum	ML	N	N	15-Oct	58.0 h-p	1.7 gh	5.7 v-A	22.6 a-u	5,117 a-o	
85	Gro-N-Graze 8493	Sorghum/Sudan	ME	N	N	5-Sep	68.7 a-f	0.0 h	6.8 o-y	13.7 u-A	727 y-D	
86	Sucrosse S-1	Sorghum/Sudan	ME	N	N	5-Sep	51.1 p	8.3 e-h	8.2 g-q	16.9 g-A	224 CD	
87	Sucrosse S-2	Sorghum/Sudan	ME	N	N	5-Sep	65.1 a-l	3.3 fgh	6.8 o-y	14.6 t-A	493 A-D	
88	Sucrosse 5-R BMR	Sorghum/Sudan	ME	Y	Y	5-Sep	57.4 j-p	5.0 e-h	6.7 p-y	16.7 i-A	748 y-D	
89	Sucrosse 9-R PS	Sorghum/Sudan	PS	N	N	15-Oct	68.4 a-g	0.0 h	10.7 ab	22.3 a-w	0 D	
90	Check 1 (Pioneer 84G62)	Grain Sorghum	ML	N	N	22-Sep	57.5 i-p	0.0 h	3.7 BC	18.2 e-y	6,468 a-f	
91	Check 2 (A571)	Grain Sorghum	ML	N	N	22-Sep	54.9 m-p	0.0 h	3.7 BC	18.8 e-y	6,395 a-g	
92	Check 3 (NC+7R83)	Grain Sorghum	M	N	N	1-Oct	56.0 l-p	0.0 h	3.5 BC	16.9 g-A	6,436 a-g	
LSD (P=.05)							5.32	13.35	0.98	5.00	1433.99	
Standard Deviation							3.29	8.26	0.61	3.09	887.00	
CV							5.04	105.14	7.97	16.00	30.36	

<sup>1)</sup> Variety information as reported by seed companies. Male sterile entries were cross pollinated by other entries.

<sup>2)</sup> Means in each column followed by same letter do not significantly differ (P=0.05).

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>																				
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	% Crude Protein	% ADF		% NDF		TDN		NEL (Mcal/lb)		NEM (Mcal/lb)		NEG (Mcal/lb)		Ca		
1	Sweet Choice BMR	F. Sorghum	ML	Y	Y	7.43	a-s	26.6	h-x	44.9	g-v	66	a-k	0.67	a-q	0.66	a-n	0.4	a-m	0.13	b-f
2	Sweet King BMR	Sorghum/Sudan	ML	Y	Y	7.87	a-o	26.9	e-x	45.6	e-v	65.3	a-l	0.66	a-q	0.65	a-n	0.38	a-m	0.21	a-f
3	775W	Grain Sorghum	M	N	N	10.3	a	20.8	u-x	37	r-v	69.7	a-g	0.74	a-f	0.73	a-e	0.45	a-g	0.21	a-f
4	Tridan	Sorghum/Sudan	ML	N	N	7.57	a-q	29.4	a-u	49.4	a-r	54	k-t	0.54	k-v	0.48	k-t	0.23	k-s	0.26	a-f
5	Cadan 10/10	Sorghum/Sudan	ML	N	N	7.2	b-u	30.2	a-s	49	b-s	62	a-s	0.62	a-u	0.6	a-s	0.34	a-r	0.26	a-f
6	Cadan 99B	Sorghum/Sudan	ML	N	N	7.8	a-p	29.5	a-u	49.1	b-s	62	a-s	0.62	a-u	0.6	a-r	0.34	a-q	0.34	a-d
7	Challenger	Grain Sorghum	ME	N	N	9	a-e	20.5	vw-x	34.9	s-v	70	a-f	0.75	a-d	0.74	a-d	0.46	a-d	0.15	b-f
8	Challenger E	Grain Sorghum	ME	N	N	9.9	ab	23.2	p-x	39.1	p-v	65.7	a-k	0.69	a-n	0.67	a-n	0.4	a-m	0.23	a-f
9	Silage Master	F. Sorghum	ML	N	N	5.63	h-v	28.9	a-v	48.8	c-t	60	a-t	0.6	b-v	0.57	a-t	0.31	a-s	0.21	a-f
10	URON	Sorghum/Sudan	ML	N	N	6.97	c-v	31.4	a-q	55	a-l	57.7	d-t	0.55	i-v	0.52	e-t	0.27	d-s	0.37	ab
11	Maxi Gain	Sorghum/Sudan	PS	N	N	4.77	q-v	36.1	a-d	57.9	a-h	51.7	n-t	0.48	s-v	0.43	o-t	0.18	n-s	0.29	a-f
12	Sugar Graze Ultra	Sorghum/Sudan	PS	N	N	5.23	l-v	37.2	a	60.7	abc	50	st	0.44	v	0.39	st	0.14	rs	0.36	abc
13	Sugar Graze 2000	Sorghum/Sudan	L	N	N	6.57	c-v	34.6	a-i	56.7	a-i	51.3	o-t	0.48	r-v	0.42	p-t	0.17	o-s	0.29	a-f
14	GW 3072F	F. Sorghum	M	N	N	6.97	c-v	24.3	n-x	40.5	m-v	66	a-k	0.69	a-n	0.67	a-n	0.4	a-m	0.2	a-f
15	GW 9530F	F. Sorghum	ML	N	Y	7.73	a-p	24.6	m-x	40.5	m-v	66.7	a-k	0.7	a-l	0.68	a-k	0.41	a-k	0.22	a-f
16	DSS Dividend BMR	F. Sorghum	ML	Y	N	6.37	d-v	27.4	d-x	46.4	d-u	64	a-p	0.64	a-t	0.63	a-p	0.37	a-n	0.25	a-f
17	DSS Bonus BMR	Sorghum/Sudan	PS	Y	N	6.13	e-v	33.3	a-m	55.4	a-k	48.7	t	0.46	uv	0.38	t	0.14	s	0.16	a-f
18	DSS Bonus-R BMR	Sorghum/Sudan	PS	Y	N	5.27	k-v	35.5	a-g	59.5	a-f	57.7	d-t	0.53	l-v	0.51	f-t	0.26	f-s	0.12	c-f
19	Silmaker 6000	F. Sorghum	M	N	N	8.33	a-i	26.2	h-x	45.7	e-v	60.7	a-t	0.62	a-u	0.58	a-t	0.32	a-s	0.33	a-e
20	Silmaker 6500	F. Sorghum	ML	N	N	7.33	b-t	25.1	l-x	41.9	k-v	59.3	b-t	0.62	a-u	0.56	b-t	0.31	a-s	0.15	a-f
21	Silmaker 7000	F. Sorghum	L	N	N	6.53	c-v	28.6	a-v	47.5	c-u	60.7	a-t	0.61	b-v	0.58	a-t	0.32	a-s	0.22	a-f
22	992003 bmr	F. Sorghum	M	Y	N	7.53	a-r	26	i-x	43.6	i-v	64	a-p	0.65	a-r	0.63	a-o	0.37	a-n	0.24	a-f
23	991005 bmr	F. Sorghum	M	Y	N	8.5	a-h	24.1	o-x	40.2	n-v	66.7	a-k	0.69	a-m	0.67	a-l	0.41	a-l	0.26	a-f
24	22053 bmr	Sorghum/Sudan	PS	Y	N	5.57	i-v	34.6	a-i	53.8	a-o	53.7	k-t	0.51	o-v	0.46	m-t	0.21	m-s	0.23	a-f
25	Garst 325	F. Sorghum	L	N	N	6.1	e-v	30.8	a-r	49.1	b-r	57	f-t	0.57	f-v	0.52	e-t	0.26	f-s	0.27	a-f
26	Garst Hi-Energy II	F. Sorghum	L	N	N	6.4	d-v	30.2	a-s	48	c-u	58	d-t	0.58	d-v	0.53	d-t	0.28	c-s	0.18	a-f
27	Garst BMR 344	F. Sorghum	ML	Y	N	7.43	a-s	26.9	f-x	44	g-v	63.3	a-r	0.65	a-s	0.62	a-q	0.36	a-o	0.19	a-f
28	Garst BMR 348	F. Sorghum	ML	Y	N	8.23	a-j	22.1	r-x	35.3	r-v	72.3	ab	0.77	ab	0.76	ab	0.48	a	0.09	f
29	Garst N-322-X	F. Sorghum	ML	N	N	5.57	i-v	29.2	a-v	48.2	c-u	57.3	e-t	0.57	e-v	0.53	d-t	0.27	d-s	0.26	a-f
30	Garst 331-X	F. Sorghum	ML	N	N	7.17	b-u	26.4	h-x	43.7	h-v	62.7	a-s	0.64	a-t	0.61	a-r	0.35	a-q	0.22	a-f
31	Garst N765 BMR-X	Sorghum/Sudan	PS	Y	N	6.13	e-v	36.1	a-d	54.9	a-l	53.7	k-t	0.51	p-v	0.46	n-t	0.21	m-s	0.2	a-f
32	Garst R723BMR-X	Sorghum/Sudan	PS	Y	N	6	f-v	34.1	a-k	59.4	a-f	59.7	b-t	0.54	j-v	0.54	c-t	0.29	b-s	0.22	a-f
33	MMR 366/70BMR	Sorghum/Sudan	PS	Y	N	4.47	tuv	34.9	a-h	56.4	a-j	56.3	h-t	0.52	m-v	0.49	i-t	0.24	i-s	0.23	a-f
34	MMR 366/23BMR	F. Sorghum	ML	Y	N	6.07	f-v	26.6	h-x	45.9	e-v	67.3	a-j	0.68	a-p	0.67	a-m	0.41	a-l	0.13	b-f
35	MMR 366/36BMR	F. Sorghum	L	Y	Y	5.63	h-v	34.2	a-j	58.1	a-g	57	f-t	0.52	m-v	0.51	g-t	0.25	h-s	0.26	a-f
36	MMR 366/35BMR	F. Sorghum	ML	Y	N	7.27	b-u	25.6	j-x	43.6	i-v	67.7	a-j	0.7	a-l	0.68	a-k	0.42	a-k	0.15	b-f

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>																				
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	% Crude Protein		% ADF		% NDF		TDN		NEL (Mcal/lb)		NEM (Mcal/lb)		NEG (Mcal/lb)		Ca	
37	DeKalb FS-5	F. Sorghum	ML	N	N	7.6	a-q	26	i-x	42.4	j-v	66.7	a-k	0.69	a-n	0.67	a-l	0.4	a-m	0.21	a-f
38	DeKalb FS-25E	F. Sorghum	L	N	N	4.63	r-v	31.7	a-p	54.7	a-m	54	k-t	0.51	o-v	0.46	m-t	0.21	m-s	0.21	a-f
39	DeKalb DKS 59-09	F. Sorghum	ML	N	N	8.13	a-l	19.3	x	32	v	73	a	0.78	a	0.78	a	0.5	a	0.11	def
40	4 Ever Green	F. Sorghum	PS	N	N	5.07	n-v	37.1	a	63.2	ab	54.7	j-t	0.47	tuv	0.46	l-t	0.21	l-s	0.32	a-f
41	4 Ever Green BMR	F. Sorghum	PS	Y	N	5.77	g-v	35.4	a-g	59.3	a-f	61.3	a-t	0.56	h-v	0.56	b-t	0.31	a-s	0.23	a-f
42	Millennium BMR	F. Sorghum	ML	Y	N	7.57	a-q	23	q-x	38.1	q-v	70.7	a-d	0.74	a-e	0.74	a-d	0.46	a-e	0.13	b-f
43	Century BMR	F. Sorghum	ML	Y	N	8.7	a-f	24.7	l-x	43.8	h-v	63.7	a-q	0.66	a-q	0.63	a-o	0.37	a-n	0.23	a-f
44	NC+ Nutri-Cane II	F. Sorghum	ML	N	Y	7.77	a-p	24.4	n-x	39.7	o-v	68.3	a-h	0.72	a-i	0.71	a-h	0.43	a-i	0.21	a-f
45	NC+ Nutri-Choice II	F. Sorghum	ML	N	N	6.63	c-v	29.7	a-t	49.3	a-r	57.7	d-t	0.57	f-v	0.52	e-t	0.27	e-s	0.1	ef
46	NC+ Nutri-Ton II	F. Sorghum	ML	N	N	6.93	c-v	29.1	a-v	49	b-s	57.3	e-t	0.57	e-v	0.52	e-t	0.27	d-s	0.24	a-f
47	811F	F. Sorghum	PS	N	N	5.06	n-v	36.8	ab	63.5	a	52.5	l-t	0.45	uv	0.43	o-t	0.18	n-s	0.28	a-f
48	979	Sorghum/Sudan	ML	N	Y	9.9	ab	23	p-x	38.5	q-v	71.3	abc	0.75	abc	0.75	abc	0.47	abc	0.26	a-f
49	Nutri+Plus BMR	Sorghum/Sudan	ML	Y	N	8.7	a-f	25.8	j-x	43.8	h-v	60.3	a-t	0.62	a-u	0.58	a-t	0.32	a-s	0.39	a
50	Red+Top Plus BMR	F. Sorghum	ML	Y	Y	8.17	a-k	25.3	l-x	42	k-v	64.7	a-n	0.67	a-q	0.65	a-n	0.38	a-m	0.23	a-f
51	Silo+Plus BMR	F. Sorghum	ML	Y	N	7.97	a-n	26.8	g-x	44.9	g-v	66	a-k	0.68	a-p	0.67	a-n	0.39	a-m	0.23	a-f
52	MS505 DS BMR X	Sorghum/Sudan	ME	Y	N	8.5	a-h	27.8	c-x	48.7	c-t	61.3	a-t	0.61	b-v	0.59	a-t	0.33	a-s	0.3	a-f
53	Silo 700D	F. Sorghum	L	N	N	5.4	j-v	33.4	a-l	54.3	a-n	56.7	g-t	0.54	k-v	0.5	h-t	0.25	i-s	0.24	a-f
54	Bundle King BMR	F. Sorghum	L	Y	Y	5.13	m-v	31.3	a-q	53.1	a-p	58.3	c-t	0.56	g-v	0.53	d-t	0.27	d-s	0.2	a-f
55	Dairy Master BMR	F. Sorghum	ML	Y	N	7.83	a-o	21.9	s-x	36.8	r-v	70.3	a-e	0.74	a-e	0.73	a-e	0.46	a-f	0.15	a-f
56	Pacesetter BMR	Sorghum/Sudan	PS	Y	N	5.77	g-v	36.2	abc	60.6	a-d	57	f-t	0.51	p-v	0.5	h-t	0.24	i-s	0.26	a-f
57	Canex	F. Sorghum	ME	N	Y	7.4	a-s	26.1	i-x	41.2	l-v	66.3	a-k	0.69	a-n	0.68	a-k	0.41	a-l	0.25	a-f
58	Canex BMR208	F. Sorghum	ME	Y	N	7.83	a-o	24.3	n-x	42.9	i-v	68.3	a-h	0.71	a-k	0.7	a-i	0.43	a-i	0.26	a-f
59	Canex BMR310	F. Sorghum	ME	Y	N	7.7	a-p	25.3	l-x	46	e-v	66.7	a-k	0.67	a-q	0.67	a-m	0.4	a-m	0.32	a-f
60	Canex BMR248	F. Sorghum	ME	Y	N	8.2	a-j	24.6	m-x	44.1	g-v	67.3	a-j	0.69	a-n	0.68	a-k	0.42	a-k	0.24	a-f
61	Canex BMR340	F. Sorghum	ME	Y	N	8.67	a-g	24.7	l-x	40.6	m-v	70	a-f	0.72	a-h	0.72	a-f	0.45	a-g	0.17	a-f
62	Fame	F. Sorghum	ME	N	N	7.57	a-q	19.7	wx	34.7	tuv	70.3	a-e	0.75	a-d	0.74	a-d	0.46	a-d	0.24	a-f
63	FS 515HQ	F. Sorghum	ME	N	N	7.77	a-p	24.7	l-x	40.9	l-v	64.3	a-o	0.66	a-q	0.63	a-o	0.37	a-n	0.15	a-f
64	FS 555	F. Sorghum	ME	N	N	4.9	p-v	32.6	a-o	53.6	a-o	57.3	e-t	0.55	h-v	0.52	e-t	0.26	f-s	0.28	a-f
65	FS 575	F. Sorghum	L	N	N	4.77	q-v	33	a-n	51.7	a-q	61	a-t	0.6	b-v	0.58	a-t	0.32	a-s	0.21	a-f
66	Sug-R-Cane	F. Sorghum	M	N	Y	8.07	a-l	23	p-x	39.1	p-v	68	a-i	0.71	a-j	0.7	a-i	0.43	a-i	0.2	a-f
67	BMR 100	F. Sorghum	M	Y	N	7.6	a-q	25.4	k-x	41.6	k-v	65.3	a-l	0.68	a-p	0.66	a-n	0.39	a-m	0.2	a-f
68	BMR 106	F. Sorghum	M	Y	N	7.77	a-p	26.1	i-x	44.8	g-v	68.3	a-h	0.7	a-l	0.7	a-j	0.43	a-j	0.2	a-f
69	NK 300	F. Sorghum	M	N	N	6.3	e-v	24.7	l-x	40.9	l-v	64.7	a-n	0.68	a-p	0.65	a-n	0.38	a-m	0.19	a-f
70	SS 405	F. Sorghum	L	N	N	5.93	f-v	33.3	a-m	57.1	a-i	57	f-t	0.53	l-v	0.51	g-t	0.26	g-s	0.26	a-f
71	SS 506	F. Sorghum	L	N	N	5	o-v	35.4	a-g	59.4	a-f	51	p-t	0.46	uv	0.41	q-t	0.16	p-s	0.32	a-f
72	1990	F. Sorghum	PS	N	N	5.7	h-v	35.6	a-f	60.9	abc	56.3	h-t	0.5	q-v	0.49	j-t	0.23	j-s	0.31	a-f

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>																				
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	% Crude Protein	% ADF	% NDF	TDN	NEL (Mcal/lb)	NEM (Mcal/lb)	NEG (Mcal/lb)	Ca								
73	HIKANE II	F. Sorghum	M	N	N	7.3	b-t	25.9	i-x	43.6	i-v	63	a-s	0.65	a-s	0.62	a-p	0.36	a-o	0.24	a-f
74	Sordan 79	Sorghum/Sudan	M	N	N	8.07	a-l	29	a-v	47.8	c-u	59.5	b-t	0.6	b-v	0.56	b-t	0.3	a-s	0.29	a-f
75	Sordan Headless	Sorghum/Sudan	PS	N	N	4.57	s-v	36.9	ab	59.6	a-e	50.7	q-t	0.46	uv	0.4	rst	0.15	qrs	0.22	a-f
76	Trudan 8	Sudangrass	M	N	N	9.36	abc	25.4	k-x	41.6	k-v	65	a-m	0.67	a-q	0.65	a-n	0.38	a-m	0.23	a-f
77	Trudan Headless	Sudangrass	PS	N	N	5.53	i-v	34.6	a-i	55	a-l	55	i-t	0.52	n-v	0.48	k-t	0.23	k-s	0.27	a-f
78	2-Way 199PS	F. Sorghum	PS	N	N	5.33	j-v	36.5	abc	60.3	a-d	52	m-t	0.47	uv	0.43	o-t	0.18	n-s	0.33	a-e
79	2-Way BMR	F. Sorghum	M	Y	N	8.03	a-m	23	p-x	37.8	q-v	70	a-f	0.73	a-g	0.73	a-e	0.45	a-g	0.15	a-f
80	2-Way SRS	F. Sorghum	ML	N	N	6.47	c-v	28.9	a-v	49.1	b-r	57.3	e-t	0.57	f-v	0.52	e-t	0.27	d-s	0.16	a-f
81	2-Way	F. Sorghum	ML	N	N	4.13	v	35.6	a-e	56.5	a-j	50.3	rst	0.47	tuv	0.4	rst	0.16	qrs	0.31	a-f
82	Sweet Bee	F. Sorghum	ME	N	N	7.27	b-u	24.5	n-x	41.9	k-v	63.3	a-r	0.66	a-q	0.63	a-o	0.37	a-n	0.27	a-f
83	Sweet Bee Sterile II	F. Sorghum	ME	N	Y	8.37	a-i	23.7	p-x	38.5	q-v	67.7	a-j	0.71	a-j	0.69	a-j	0.43	a-j	0.28	a-f
84	2-Way F103	F. Sorghum	ML	N	N	7.17	b-u	28.5	a-v	46.4	d-u	57.7	d-t	0.58	c-v	0.53	d-t	0.28	c-s	0.15	a-f
85	Gro-N-Graze 8493	Sorghum/Sudan	ME	N	N	8.4	a-i	27.4	d-x	45.3	f-v	64.7	a-n	0.66	a-q	0.65	a-n	0.38	a-m	0.2	a-f
86	Sucrosse S-1	Sorghum/Sudan	ME	N	N	8.67	a-g	24.8	l-x	42.2	k-v	62.7	a-s	0.65	a-s	0.62	a-q	0.35	a-p	0.29	a-f
87	Sucrosse S-2	Sorghum/Sudan	ME	N	N	9.23	a-d	25.1	l-x	41.2	k-v	66	a-k	0.68	a-o	0.66	a-n	0.4	a-m	0.31	a-f
88	Sucrosse 5-R BMR	Sorghum/Sudan	ME	Y	Y	8.03	a-m	28.2	b-w	48.5	c-u	61	a-t	0.61	b-v	0.59	a-t	0.33	a-s	0.3	a-f
89	Sucrosse 9-R PS	Sorghum/Sudan	PS	N	N	4.37	uv	36.3	abc	59.5	a-f	52	m-t	0.47	uv	0.43	o-t	0.18	n-s	0.24	a-f
90	Check 1 (Pioneer 84G62)	Grain Sorghum	ML	N	N	7.57	a-q	21.1	t-x	35.6	r-v	69	a-h	0.73	a-f	0.72	a-g	0.45	a-h	0.17	a-f
91	Check 2 (A571)	Grain Sorghum	ML	N	N	7.83	a-o	21.1	t-x	35.5	r-v	70.7	a-d	0.75	ab	0.74	abc	0.47	abc	0.11	def
92	Check 3 (NC+7R83)	Grain Sorghum	M	N	N	7.7	a-p	19.4	x	34.3	uv	71.3	abc	0.76	ab	0.76	ab	0.48	ab	0.15	b-f
LSD (P=.05)						1.587		4.781		7.752		7.13		0.094		0.116		0.106		0.131	
Standard Deviation						0.982		2.957		4.795		4.41		0.058		0.072		0.066		0.081	
CV						14.01		10.44		10.15		7.14		9.44		12.1		19.79		35.44	

<sup>1)</sup>Variety information as reported by seed companies. Male sterile entries were cross pollinated by other entries.

<sup>2)</sup>Means in each column followed by same letter do not significantly differ (P=0.05).

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>																	
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	P		Mg		K		S		% Lignin		% IVTD		IVTD, lb/ac
1	Sweet Choice BMR	F. Sorghum	ML	Y	Y	0.27	a-d	0.15	f-l	1.48	a-k	0.17	a	2.53	o-r	81.7	a-h	11,125
2	Sweet King BMR	Sorghum/Sudan	ML	Y	Y	0.22	a-d	0.19	a-l	1.29	a-k	0.13	a-e	3.83	a-r	80.7	a-j	9,701
3	775W	Grain Sorghum	M	N	N	0.29	abc	0.27	a-d	0.85	ijk	0.12	a-e	3.17	i-r	82.3	a-g	4,841
4	Tridan	Sorghum/Sudan	ML	N	N	0.24	a-d	0.27	a-d	1.19	a-k	0.09	b-e	5.67	abc	66.7	lm	6,921
5	Cadan 10/10	Sorghum/Sudan	ML	N	N	0.21	a-d	0.24	a-j	0.76	jk	0.08	cde	4.83	a-m	75	a-m	6,437
6	Cadan 99B	Sorghum/Sudan	ML	N	N	0.27	a-d	0.28	a	1.1	d-k	0.08	de	4.8	a-n	76	a-m	9,140
7	Challenger	Grain Sorghum	ME	N	N	0.23	a-d	0.25	a-h	1	e-k	0.11	a-e	2.83	m-r	82.3	a-g	7,792
8	Challenger E	Grain Sorghum	ME	N	N	0.27	a-d	0.25	a-g	0.98	f-k	0.11	a-e	3.27	g-r	78	a-m	4,657
9	Silage Master	F. Sorghum	ML	N	N	0.23	a-d	0.18	a-l	1.36	a-k	0.1	a-e	4.07	a-r	74.7	a-m	12,874
10	URON	Sorghum/Sudan	ML	N	N	0.22	a-d	0.25	a-i	1.24	a-k	0.12	a-e	5.37	a-g	72.3	b-m	7,762
11	Maxi Gain	Sorghum/Sudan	PS	N	N	0.23	a-d	0.18	a-l	1.98	abc	0.12	a-e	5.57	a-e	69.3	g-m	10,318
12	Sugar Graze Ultra	Sorghum/Sudan	PS	N	N	0.21	a-d	0.19	a-l	1.71	a-h	0.15	abc	5.37	a-g	66.7	lm	11,159
13	Sugar Graze 2000	Sorghum/Sudan	L	N	N	0.21	a-d	0.2	a-l	1.86	a-d	0.15	abc	4.27	a-r	67.3	klm	9,572
14	GW 3072F	F. Sorghum	M	N	N	0.24	a-d	0.23	a-l	0.96	g-k	0.07	e	4.2	a-r	79.3	a-l	11,528
15	GW 9530F	F. Sorghum	ML	N	Y	0.23	a-d	0.22	a-l	1.14	c-k	0.13	a-e	3.53	d-r	80.3	a-k	9,520
16	DSS Dividend BMR	F. Sorghum	ML	Y	N	0.2	bcd	0.22	a-l	1.38	a-k	0.13	a-e	2.83	m-r	79.7	a-l	10,557
17	DSS Bonus BMR	Sorghum/Sudan	PS	Y	N	0.21	a-d	0.17	c-l	1.75	a-g	0.13	a-e	4.97	a-l	65.7	m	10,214
18	DSS Bonus-R BMR	Sorghum/Sudan	PS	Y	N	0.2	bcd	0.14	h-l	1.73	a-h	0.12	a-e	4.87	a-m	74.3	a-m	10,739
19	Silmaker 6000	F. Sorghum	M	N	N	0.31	a	0.28	abc	1.45	a-k	0.09	cde	4.17	a-r	75	a-m	6,930
20	Silmaker 6500	F. Sorghum	ML	N	N	0.25	a-d	0.24	a-j	0.98	f-k	0.09	b-e	4.13	a-r	72	c-m	9,626
21	Silmaker 7000	F. Sorghum	L	N	N	0.23	a-d	0.2	a-l	1.41	a-k	0.12	a-e	3.73	a-r	75.7	a-m	10,430
22	992003 bmr	F. Sorghum	M	Y	N	0.24	a-d	0.15	f-l	1.48	a-k	0.12	a-e	3.37	f-r	79.7	a-l	8,984
23	991005 bmr	F. Sorghum	M	Y	N	0.24	a-d	0.17	d-l	1.31	a-k	0.1	a-e	3.27	g-r	80.3	a-k	9,795
24	22053 bmr	Sorghum/Sudan	PS	Y	N	0.25	a-d	0.18	a-l	1.72	a-h	0.13	a-e	4.63	a-o	69.7	f-m	12,714
25	Garst 325	F. Sorghum	L	N	N	0.23	a-d	0.22	a-l	1.38	a-k	0.11	a-e	5.03	a-l	72.7	b-m	13,699
26	Garst Hi-Energy II	F. Sorghum	L	N	N	0.23	a-d	0.23	a-l	1.29	a-k	0.1	a-e	5.23	a-i	73	b-m	12,121
27	Garst BMR 344	F. Sorghum	ML	Y	N	0.23	a-d	0.13	kl	1.5	a-k	0.16	ab	2.77	m-r	78.3	a-m	10,275
28	Garst BMR 348	F. Sorghum	ML	Y	N	0.26	a-d	0.14	jkl	1.24	a-k	0.13	a-e	2.3	r	86.3	a	9,917
29	Garst N-322-X	F. Sorghum	ML	N	N	0.27	a-d	0.22	a-l	1.3	a-k	0.09	cde	5.43	a-f	72.3	b-m	12,906
30	Garst 331-X	F. Sorghum	ML	N	N	0.23	a-d	0.21	a-l	1.01	e-k	0.08	cde	4.8	a-n	76	a-m	13,843
31	Garst N765 BMR-X	Sorghum/Sudan	PS	Y	N	0.2	bcd	0.14	i-l	1.83	a-e	0.14	a-e	4.77	a-n	70.3	e-m	9,994
32	Garst R723BMR-X	Sorghum/Sudan	PS	Y	N	0.21	a-d	0.21	a-l	1.77	a-g	0.11	a-e	4.2	a-r	77	a-m	15,286
33	MMR 366/70BMR	Sorghum/Sudan	PS	Y	N	0.21	a-d	0.16	e-l	2.03	a	0.13	a-e	4.33	a-r	73.3	a-m	12,325
34	MMR 366/23BMR	F. Sorghum	ML	Y	N	0.2	bcd	0.17	c-l	1.35	a-k	0.12	a-e	3.2	h-r	82	a-h	11,687
35	MMR 366/36BMR	F. Sorghum	L	Y	Y	0.24	a-d	0.21	a-l	1.98	abc	0.14	a-e	4.2	a-r	73.7	a-m	12,330
36	MMR 366/35BMR	F. Sorghum	ML	Y	N	0.23	a-d	0.14	i-l	1.4	a-k	0.13	a-e	3.67	b-r	82.7	a-f	8,703

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>																	
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	P		Mg		K		S		% Lignin		% IVTD		IVTD, lb/ac
37	DeKalb FS-5	F. Sorghum	ML	N	N	0.23	a-d	0.18	a-l	1.45	a-k	0.12	a-e	3.93	a-r	81.3	a-h	13,914
38	DeKalb FS-25E	F. Sorghum	L	N	N	0.18	d	0.21	a-l	1.49	a-k	0.12	a-e	5	a-l	69.7	f-m	13,953
39	DeKalb DKS 59-09	F. Sorghum	ML	N	N	0.22	a-d	0.13	l	1.09	d-k	0.12	a-e	2.23	r	85.3	ab	10,823
40	4 Ever Green	F. Sorghum	PS	N	N	0.19	cd	0.19	a-l	1.73	a-h	0.13	a-e	5.3	a-h	72.3	b-m	15,291
41	4 Ever Green BMR	F. Sorghum	PS	Y	N	0.2	bcd	0.23	a-l	1.75	a-g	0.13	a-e	4.13	a-r	79	a-l	13,880
42	Millennium BMR	F. Sorghum	ML	Y	N	0.25	a-d	0.17	d-l	1.65	a-i	0.12	a-e	2.4	qr	84.7	abc	9,442
43	Century BMR	F. Sorghum	ML	Y	N	0.26	a-d	0.26	a-f	1.11	d-k	0.09	b-e	4	a-r	76	a-m	7,890
44	NC+ Nutri-Cane II	F. Sorghum	ML	N	Y	0.22	a-d	0.19	a-l	1.08	d-k	0.11	a-e	3	k-r	82.3	a-g	10,886
45	NC+ Nutri-Choice II	F. Sorghum	ML	N	N	0.21	a-d	0.17	b-l	1.13	d-k	0.09	b-e	5.77	ab	72	c-m	11,123
46	NC+ Nutri-Ton II	F. Sorghum	ML	N	N	0.21	a-d	0.2	a-l	1.11	d-k	0.09	cde	5.13	a-j	71.3	d-m	12,667
47	811F	F. Sorghum	PS	N	N	0.19	cd	0.22	a-l	1.82	a-f	0.12	a-e	5.34	a-g	68.9	h-m	14,173
48	979	Sorghum/Sudan	ML	N	Y	0.26	a-d	0.24	a-k	1.17	b-k	0.13	a-e	3.6	c-r	84	a-d	9,249
49	Nutri+Plus BMR	Sorghum/Sudan	ML	Y	N	0.3	ab	0.23	a-l	1.34	a-k	0.11	a-e	4.33	a-r	74.7	a-m	7,035
50	Red+Top Plus BMR	F. Sorghum	ML	Y	Y	0.27	a-d	0.2	a-l	1.01	e-k	0.13	a-e	4.23	a-r	79	a-l	9,711
51	Silo+Plus BMR	F. Sorghum	ML	Y	N	0.22	a-d	0.2	a-l	1.21	a-k	0.15	abc	3.07	j-r	81	a-i	9,208
52	MS505 DS BMR X	Sorghum/Sudan	ME	Y	N	0.28	a-d	0.24	a-j	1.28	a-k	0.13	a-e	3.97	a-r	76.3	a-m	6,470
53	Silo 700D	F. Sorghum	L	N	N	0.21	a-d	0.16	e-l	1.63	a-i	0.12	a-e	4.83	a-m	72.3	b-m	9,336
54	Bundle King BMR	F. Sorghum	L	Y	Y	0.24	a-d	0.18	a-l	1.64	a-i	0.13	a-e	3.8	a-r	74	a-m	10,065
55	Dairy Master BMR	F. Sorghum	ML	Y	N	0.21	a-d	0.17	b-l	1.34	a-k	0.13	a-e	2.23	r	84	a-d	10,566
56	Pacesetter BMR	Sorghum/Sudan	PS	Y	N	0.21	a-d	0.2	a-l	1.99	ab	0.12	a-e	4.5	a-q	74.7	a-m	10,762
57	Canex	F. Sorghum	ME	N	Y	0.19	cd	0.2	a-l	1.12	d-k	0.14	a-e	3.63	c-r	80.7	a-j	9,865
58	Canex BMR208	F. Sorghum	ME	Y	N	0.25	a-d	0.2	a-l	1.43	a-k	0.12	a-e	3.37	f-r	82.3	a-g	7,567
59	Canex BMR310	F. Sorghum	ME	Y	N	0.25	a-d	0.23	a-l	1.64	a-i	0.12	a-e	3.17	i-r	80.7	a-j	6,759
60	Canex BMR248	F. Sorghum	ME	Y	N	0.25	a-d	0.22	a-l	1.26	a-k	0.12	a-e	3.03	j-r	81.7	a-h	8,907
61	Canex BMR340	F. Sorghum	ME	Y	N	0.23	a-d	0.19	a-l	1.25	a-k	0.14	a-e	2.5	pqr	83.7	a-d	8,738
62	Fame	F. Sorghum	ME	N	N	0.26	a-d	0.19	a-l	1.29	a-k	0.11	a-e	3.07	j-r	83.3	a-e	8,592
63	FS 515HQ	F. Sorghum	ME	N	N	0.2	bcd	0.18	a-l	0.78	jk	0.1	b-e	5.3	a-h	77.7	a-m	11,249
64	FS 555	F. Sorghum	ME	N	N	0.2	bcd	0.19	a-l	1.42	a-k	0.09	b-e	5.63	a-d	73.3	a-m	12,278
65	FS 575	F. Sorghum	L	N	N	0.17	d	0.17	c-l	1.11	d-k	0.13	a-e	4.63	a-o	75.7	a-m	13,719
66	Sug-R-Cane	F. Sorghum	M	N	Y	0.23	a-d	0.21	a-l	1.1	d-k	0.1	b-e	3.37	f-r	80.7	a-j	8,685
67	BMR 100	F. Sorghum	M	Y	N	0.23	a-d	0.19	a-l	1.32	a-k	0.1	a-e	3.77	a-r	79.7	a-l	9,408
68	BMR 106	F. Sorghum	M	Y	N	0.23	a-d	0.18	a-l	1.52	a-k	0.12	a-e	3.07	j-r	82.7	a-f	8,524
69	NK 300	F. Sorghum	M	N	N	0.23	a-d	0.18	a-l	0.99	f-k	0.07	e	3.93	a-r	77.7	a-m	11,010
70	SS 405	F. Sorghum	L	N	N	0.18	cd	0.19	a-l	1.6	a-j	0.13	a-e	5.27	a-i	72.7	b-m	11,517
71	SS 506	F. Sorghum	L	N	N	0.19	cd	0.21	a-l	1.54	a-k	0.11	a-e	5.37	a-g	67	lm	11,692
72	1990	F. Sorghum	PS	N	N	0.23	a-d	0.22	a-l	1.7	a-h	0.12	a-e	4.83	a-m	72.7	b-m	12,254

**Table 2. 2003 Comparison of sorghum hybrids for agronomic characteristics, yield, and nutrient composition.**

Entry Num.	Variety Information <sup>1)</sup>																	
	Variety Name	Sorghum Type	Maturity	BMR	Male Sterile	P		Mg		K		S		% Lignin		% IVTD		IVTD, lb/ac
73	HIKANE II	F. Sorghum	M	N	N	0.24	a-d	0.22	a-l	1.07	d-k	0.12	a-e	4.07	a-r	76.7	a-m	10,170
74	Sordan 79	Sorghum/Sudan	M	N	N	0.25	a-d	0.28	ab	1.29	a-k	0.09	b-e	4.82	a-n	72.9	b-m	8,411
75	Sordan Headless	Sorghum/Sudan	PS	N	N	0.18	d	0.19	a-l	1.59	a-j	0.11	a-e	5.33	a-g	68	i-m	11,510
76	Trudan 8	Sudangrass	M	N	N	0.26	a-d	0.21	a-l	1.09	d-k	0.14	a-e	4.14	a-r	77.4	a-m	6,306
77	Trudan Headless	Sudangrass	PS	N	N	0.19	cd	0.2	a-l	1.32	a-k	0.12	a-e	5.07	a-k	71.7	c-m	11,233
78	2-Way 199PS	F. Sorghum	PS	N	N	0.22	a-d	0.2	a-l	1.8	a-g	0.11	a-e	4.97	a-l	69	h-m	11,645
79	2-Way BMR	F. Sorghum	M	Y	N	0.22	a-d	0.12	l	1.3	a-k	0.15	a-d	2.47	qr	84	a-d	9,232
80	2-Way SRS	F. Sorghum	ML	N	N	0.19	cd	0.16	e-l	1.35	a-k	0.12	a-e	4.13	a-r	72	c-m	12,902
81	2-Way	F. Sorghum	ML	N	N	0.21	a-d	0.15	f-l	1.54	a-k	0.1	b-e	5.8	a	67.7	j-m	10,829
82	Sweet Bee	F. Sorghum	ME	N	N	0.21	a-d	0.21	a-l	1.18	b-k	0.1	a-e	3.83	a-r	77.7	a-m	8,895
83	Sweet Bee Sterile II	F. Sorghum	ME	N	Y	0.25	a-d	0.19	a-l	1.33	a-k	0.1	a-e	3.5	e-r	81.3	a-h	11,119
84	2-Way F103	F. Sorghum	ML	N	N	0.22	a-d	0.2	a-l	1.12	d-k	0.1	a-e	4.87	a-m	71.7	c-m	11,358
85	Gro-N-Graze 8493	Sorghum/Sudan	ME	N	N	0.23	a-d	0.22	a-l	0.9	h-k	0.1	a-e	5.43	a-f	78.3	a-m	7,484
86	Sucrosse S-1	Sorghum/Sudan	ME	N	N	0.25	a-d	0.26	a-e	0.71	k	0.11	a-e	5.07	a-k	74.3	a-m	8,798
87	Sucrosse S-2	Sorghum/Sudan	ME	N	N	0.22	a-d	0.24	a-j	0.74	k	0.13	a-e	4.87	a-m	78.7	a-m	8,013
88	Sucrosse 5-R BMR	Sorghum/Sudan	ME	Y	Y	0.26	a-d	0.28	abc	1.17	b-k	0.09	cde	4.6	a-p	75.3	a-m	8,822
89	Sucrosse 9-R PS	Sorghum/Sudan	PS	N	N	0.17	d	0.15	g-l	1.76	a-g	0.11	a-e	4.97	a-l	69	h-m	10,747
90	Check 1 (Pioneer 84G62)	Grain Sorghum	ML	N	N	0.24	a-d	0.2	a-l	1.1	d-k	0.08	cde	2.7	n-r	81.7	a-h	10,428
91	Check 2 (A571)	Grain Sorghum	ML	N	N	0.21	a-d	0.17	b-l	0.86	ijk	0.1	b-e	3.6	c-r	83.7	a-d	11,029
92	Check 3 (NC+7R83)	Grain Sorghum	M	N	N	0.23	a-d	0.17	c-l	0.86	ijk	0.09	b-e	2.93	l-r	83.3	a-e	9,852
LSD (P=.05)						0.057		0.059		0.46		0.038		1.161		7.159		
Standard Deviation						0.035		0.037		0.284		0.024		0.718		4.428		
CV						15.44		18.27		21.22		20.68		17.33		5.79		

<sup>1)</sup> Variety information as reported by seed companies. Male sterile entries were cross pollinated by other entries.

<sup>2)</sup> Means in each column followed by same letter do not significantly differ (P=0.05).