

2002

KANSAS PERFORMANCE TESTS WITH

SUMMER ANNUAL FORAGES

REPORT OF PROGRESS 906

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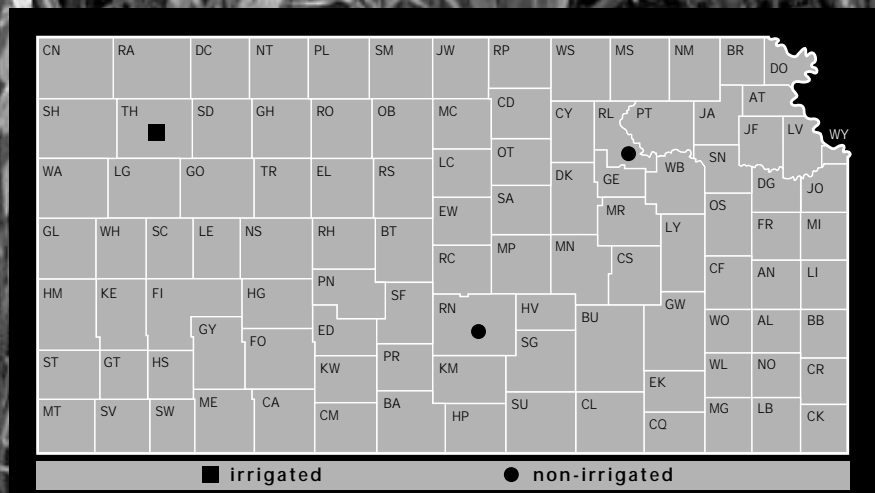


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INTRODUCTION

Kansas is a top producer of meat and animal products. An important input for the beef and dairy industries is the fodder or roughage that forms a key element in ruminant diets. In 2002, Kansas farms produced 4.3 million tons of corn and sorghum silage (January 10 Crops Report, Kansas Agricultural Statistics Service). Additional roughage was obtained from other summer annual forages such as sorghum-sudan, sudan, and millet. This publication presents the results of tests designed to compare forage production and quality of corn, sorghum, and sorghum-sudan hybrids under typical Kansas growing conditions.

PROCEDURES

Crop performance tests in Kansas are a cooperative effort of K-State Research and Extension and the private seed industry. Entry fees from private seed companies help finance the tests. Seed companies receive test announcements and entry forms in late January; deadlines for receipt of completed entry forms and seed are in early March. Because entry selection and location are voluntary, not all hybrids grown in the state are included in tests, and hybrids are not grown uniformly at all test locations.

Seed companies were offered the opportunity to participate in summer annual forage tests at four locations in 2002: Parsons, Hutchinson, Hays, and Colby. Ten companies entered a total of 16 forage sorghum hybrids, and 21 hay types (sorghum-sudan hybrids, sudan, or millet). So few entries were submitted at Parsons that the test was dropped.

Three plots (replications) of each hybrid were grown at each location in a randomized complete block design. Each forage sorghum plot consisted of four rows trimmed to a length of 20 to 30 feet, depending on location. Forage and grain yield estimates and samples for moisture and quality analysis were obtained from the center two rows. Hay-type entries were planted in narrow rows at high populations.

Each species was harvested as close as possible to the stage of maturity that would optimize yield and quality of forage; forage sorghum hybrids at mid-dough, and sorghum-sudan hybrids at boot stage. The hay-type hybrids were harvested twice at Hutchinson and Colby. At Hays, half the plot was harvested at boot stage to maximize quality and the other half was harvested about a month later to maximize forage yield.

Samples from each harvest were collected to determine moisture content and for laboratory analysis of forage quality: crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF), and acid detergent lignin (ADL). Crude protein was calculated by multiplying the nitrogen content by 6.25, the average proportion of elemental nitrogen to plant protein.

Near infrared reflectance (NIR) technology was used to predict forage quality parameters. Calibration equations were based on a subset of samples from the current year that were analyzed with wet chemistry. The R^2 for the resulting calibrations for CP and ADF were quite good at 0.97 and 0.94. The R^2 for NDF and ADL were somewhat lower at 0.90 and 0.84.

While not all of the crude protein in a forage is available to the animal as true protein, a forage with a higher level of crude protein generally requires less supplemental protein in the ration. Neutral detergent fiber (NDF) estimates total fiber consisting of cellulose, hemicellulose, and lignin and is often related to intake. Forages with lower NDF values are desirable because the animal can consume more of the forage, requiring fewer ration supplements. Acid detergent fiber (ADF) estimates total cellulose, lignin, and pectin and is often used to predict the energy content of forage. Forages with lower ADF values are desirable because of their higher energy content and generally higher digestibility. Acid detergent lignin (ADL) estimates the lignin fraction, an indigestible fiber with no nutritive value. Lower ADL values are associated with greater forage digestibility.

RESULTS

Individual test results are presented in Tables 1 - 6. Average values for hybrids in all 3 tests grown in 2002 are listed in Tables 7 and 8. Hybrid rankings followed similar trends when grown in more than one location or in more than one year. However, some hybrids were more consistent than others.

Species differences depended on irrigation. In the dryland tests, forage sorghums produced more total dry matter. Under irrigation, the hay types produced more total dry matter. Drought conditions likely limited late-season growth of the hay-types without irrigation.

In the 2002 tests, forage sorghum hybrids tended to have lower crude protein values, but the various fiber components (NDF, ADF, ADL) were also lower than in the hay types. At Hutchinson the pattern was slightly different with lower fiber values associated with the hay types as well. This may be explained by a slightly later stage of maturity at harvest of the forage sorghums at Hutchinson than at the other locations. Forage moisture at harvest of the forage sorghums at Hutchinson averaged 66% but was 71-72% at the other two locations. Harvest management and hybrid selection both play an important role in obtaining high yields of quality forage.

Table 1. Hutchinson Summer Annual Forage Test, 2002.

BRAND	NAME	Forage					Grain Days		Ht. (in)	Lodg (%)	Stnd (%)
		Yield (pounds DM/acre)			Moist. (%)		yield (bu/a)	to blm			
		Total	Cut 1	Cut 2	Cut 1	Cut 2					
FORAGE SORGHUM											
SORG. PARTNERS	1990	8,460	--	--	75	--	0	98	73	0	112
WARNER	2-WAY F-145	8,453	--	--	67	--	7	92	73	0	111
SEED RESOURCE	BMR100	6,742	--	--	63	--	25	96	52	83	74
MATURITY CHECK	ATLAS	6,267	--	--	67	--	43	92	62	2	81
VALLEY PREMIUM	UDDER BUSTER BMR	6,136	--	--	64	--	46	89	62	63	60
MATURITY CHECK	EARLY SUMAC	5,961	--	--	66	--	34	89	53	87	76
WARNER	2-WAY BMR	5,921	--	--	64	--	53	96	58	73	78
MIDLAND	TOP NOTCH	5,917	--	--	58	--	37	94	60	57	53
MIDLAND	R+S	5,891	--	--	66	--	31	97	50	77	81
	Averages	6,639	--	--	66	--	31	94	60	49	81
	CV(%)	10	--	--	4	--	30	--	6	40	10
	LSD(0.05)**	1,115	--	--	5	--	16	--	7	34	15
HAY TYPES*											
MATURITY CHECK	PIPER (SU)	5,404	3,006	2,398	74	69	--	--	71	--	--
VALLEY PREMIUM	SWEET CHIEF X-TRA (SS)	5,400	3,531	1,869	75	76	--	--	54	--	--
MIDLAND	SUPER SIOUX (SS)	5,085	2,991	2,094	81	77	--	--	57	--	--
SEED RESOURCE	PS210BMR (SS)	5,069	3,245	1,824	79	80	--	--	53	--	--
SORG. PARTNERS	SORDAN HEADLESS (SS)	5,045	3,096	1,949	77	78	--	--	48	--	--
VALLEY PREMIUM	SW. CHIEF X-TRABMR (SS)	4,931	3,033	1,898	78	77	--	--	50	--	--
MATURITY CHECK	NB280S (SS)	4,559	2,597	1,963	79	74	--	--	60	--	--
MIDLAND	KRITTER KANDY (SS)	4,485	2,977	1,508	76	77	--	--	51	--	--
SORG. PARTNERS	TRUDAN HEADLESS (SU)	4,166	2,620	1,546	75	76	--	--	47	--	--
	Averages	4,905	3,011	1,894	77	76	--	--	55	--	--
	CV(%)	6	11	13	2	3	--	--	9	--	--
	LSD(0.05)**	544	559	418	3	4	--	--	8	--	--
TEST, OVERALL											
	Averages	5,772	--	--	71	--	--	--	58	--	--
2 - Year Averages											
FORAGE SORGHUM											
WARNER	2-WAY F-145	9,191	--	--	67	--	8	86	71	0	116
WARNER	2-WAY BMR	7,404	--	--	65	--	42	85	63	73	84
MATURITY CHECK	EARLY SUMAC	7,389	--	--	66	--	28	78	62	87	81
VALLEY PREMIUM	UDDER BUSTER BMR	7,320	--	--	65	--	33	82	63	63	73
	Averages	7,895	--	--	66	--	27	84	62	49	92
HAY TYPES*											
VALLEY PREMIUM	SWEET CHIEF X-TRA (SS)	7,486	3,531	1,869	71	76	--	61	58	--	99
VALLEY PREMIUM	SW. CHIEF X-TRABMR (SS)	7,067	3,033	1,898	71	77	--	64	54	--	98
MATURITY CHECK	NB280S (SS)	6,751	2,597	1,963	71	74	--	59	59	--	89
MATURITY CHECK	PIPER (SU)	6,548	3,006	2,398	62	69	--	59	65	--	88
	Averages	6,893	3,011	1,894	70	76	--	62	56	--	93
TEST, OVERALL											
	Averages	7,394	--	--	68	--	--	68	59	--	98

* SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

** Unless two varieties differ by more than the L.S.D., little confidence can be placed in one being superior to the other.

Table 2. Hutchinson Summer Annual Forage Test, 2002.

BRAND	NAME	Forage Quality (dry matter basis)							
		Protein (%)		NDF (%)		ADF (%)		ADL (%)	
		Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2
FORAGE SORGHUM									
SORG. PARTNERS	1990	7.5	--	63.0	--	38.1	--	8.6	--
WARNER	2-WAY F-145	6.5	--	58.0	--	36.2	--	9.5	--
MATURITY CHECK	ATLAS	6.5	--	54.7	--	35.2	--	8.1	--
MATURITY CHECK	EARLY SUMAC	6.3	--	55.5	--	34.2	--	9.5	--
SEED RESOURCE	BMR100	6.3	--	58.0	--	36.5	--	11.2	--
VALLEY PREMIUM	UDDER BUSTER BMR	5.3	--	55.6	--	37.1	--	10.2	--
MIDLAND	R+S	5.3	--	58.0	--	35.7	--	10.0	--
MIDLAND	TOP NOTCH	4.8	--	60.6	--	39.6	--	10.9	--
WARNER	2-WAY BMR	4.0	--	62.3	--	39.3	--	10.8	--
	Averages	5.8	--	58.4	--	36.9	--	9.9	--
	CV(%)	8.6	--	4.8	--	5.2	--	10.8	--
	LSD(0.05)**	0.9	--	4.9	--	3.3	--	1.8	--
HAY TYPES*									
VALLEY PREMIUM	SW. CHIEF X-TRABMR (SS)	11.2	10.2	55.0	56.9	28.5	32.3	4.1	5.7
SEED RESOURCE	PS210BMR (SS)	11.1	11.2	55.8	58.8	31.9	33.5	4.3	4.4
SORG. PARTNERS	TRUDAN HEADLESS (SU)	10.7	9.5	57.0	59.2	30.7	33.4	5.6	5.8
MATURITY CHECK	NB280S (SS)	10.6	9.1	55.7	59.2	29.8	34.5	5.3	5.9
SORG. PARTNERS	SORDAN HEADLESS (SS)	10.1	10.3	56.7	58.3	30.3	32.5	5.3	4.6
MIDLAND	KRITTER KANDY (SS)	10.0	10.4	54.9	57.1	29.0	32.5	4.9	5.1
VALLEY PREMIUM	SWEET CHIEF X-TRA (SS)	9.8	9.9	56.1	58.0	29.6	33.4	5.1	5.7
MATURITY CHECK	PIPER (SU)	9.7	7.7	57.4	60.9	31.3	37.0	5.9	7.5
MIDLAND	SUPER SIOUX (SS)	9.5	9.1	55.5	57.0	29.1	32.0	5.0	5.8
	Averages	10.3	9.7	56.0	58.4	30.0	33.4	5.0	5.6
	CV(%)	6.9	10.7	1.4	2.9	4.3	5.6	11.8	10.6
	LSD(0.05)**	1.2	1.8	1.3	NS	2.3	NS	1.0	1.0
TEST, OVERALL									
	Averages	8.1	--	57.2	--	33.4	--	7.5	--
2 - Year Averages									
FORAGE SORGHUM									
WARNER	2-WAY F-145	6.4	--	56.3	--	34.7	--	7.4	--
MATURITY CHECK	EARLY SUMAC	5.8	--	51.9	--	33.6	--	7.6	--
VALLEY PREMIUM	UDDER BUSTER BMR	5.6	--	53.7	--	34.7	--	7.3	--
WARNER	2-WAY BMR	5.2	--	57.0	--	35.7	--	7.7	--
	Averages	5.8	--	55.6	--	35.0	--	7.5	--
HAY TYPES*									
VALLEY PREMIUM	SW. CHIEF X-TRABMR (SS)	10.1	--	55.4	--	29.9	--	4.3	--
VALLEY PREMIUM	SWEET CHIEF X-TRA (SS)	8.8	--	56.6	--	31.4	--	5.2	--
MATURITY CHECK	NB280S (SS)	8.5	--	56.7	--	32.3	--	5.6	--
MATURITY CHECK	PIPER (SU)	8.4	--	59.5	--	34.2	--	6.3	--
	Averages	9.2	--	56.6	--	31.5	--	5.2	--
TEST, OVERALL									
	Averages	7.5	--	56.1	--	33.2	--	6.4	--

* SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

** Unless two varieties differ by more than the L.S.D., little confidence can be placed in one being superior to the other.

Table 3. Hays Summer Annual Forage Test, 2002.

BRAND	NAME	Forage				Grain* Days		Ht. (in)	Lodg (%)	Stnd (%)	
		Yield (pounds DM/acre)		Moist. (%)		yield rating	to blm				
		Total	Cut 1	Cut 2	Cut 1						Cut 2
FORAGE SORGHUM											
MATURITY CHECK	ATLAS	9,989	--	--	75	--	3	90	71	--	--
SEED RESOURCE	BMR106	8,955	--	--	66	--	4	80	63	--	--
MOSS SEED	MILLENIUM BMR	7,731	--	--	67	--	4	88	70	--	--
SORG. PARTNERS	SS 405	7,615	--	--	74	--	4	98	83	--	--
SORG. PARTNERS	NK 300	7,613	--	--	72	--	4	97	50	--	--
STAR	EXP MV101LDP	7,546	--	--	75	--	4	88	62	--	--
MOSS SEED	4EVER GREEN	7,467	--	--	79	--	0	--	61	--	--
SORG. PARTNERS	1990	7,205	--	--	76	--	0	--	51	--	--
TRIUMPH	SUPER SILE 20	7,124	--	--	74	--	1	--	64	--	--
SEED RESOURCE	FAME	6,462	--	--	59	--	5	68	52	--	--
SEED RESOURCE	BMR100	6,462	--	--	75	--	4	90	70	--	--
GOLDEN HARVEST	SI GRO H-45	6,391	--	--	72	--	4	97	47	--	--
MATURITY CHECK	EARLY SUMAC	5,468	--	--	68	--	4	72	63	--	--
	Averages	7,347	--	--	71	--	3	86	62	--	--
	CV(%)	13	--	--	4	--	29	3	10	--	--
	LSD(0.05)**	1,620	--	--	5	--	1	4	10	--	--
HAY TYPES***											
SORG. PARTNERS	SORDAN 79 (SS)	--	7,185	5,543	82	66	--	80	62	--	--
STAR	EXP NP100 (SS)	--	6,539	5,800	79	69	--	85	57	--	--
SEED RESOURCE	PS210BMR (SS)	--	5,840	7,193	83	75	--	--	52	--	--
CAL/WEST	CW 1-63-9 (SS)	--	5,742	5,735	80	59	--	89	51	--	--
CAL/WEST	CW 1-63-1 (SS)	--	5,543	6,050	82	61	--	89	51	--	--
CAL/WEST	CW 1-61-1 (SS)	--	5,282	8,248	82	65	--	87	51	--	--
MATURITY CHECK	NB280S (SS)	--	5,258	6,350	78	60	--	75	66	--	--
SORG. PARTNERS	TRUDAN 8 (SU)	--	4,935	4,519	78	59	--	74	69	--	--
MOSS SEED	MEGA GREEN (SS)	--	4,918	7,237	83	75	--	--	44	--	--
SORG. PARTNERS	TRUDAN HEADLESS (SU)	--	4,868	5,918	85	73	--	--	42	--	--
CAL/WEST	CW 1-63-10 (SS)	--	4,831	4,865	83	65	--	93	47	--	--
SEED RESOURCE	SS200BMR (SS)	--	4,821	6,013	81	67	--	81	56	--	--
SORG. PARTNERS	SORDAN HEADLESS (SS)	--	4,768	6,611	85	75	--	--	49	--	--
CAL/WEST	CW 1-61-9 (SS)	--	4,714	5,492	82	66	--	86	53	--	--
MOSS SEED	CENTURY BMR (SS)	--	4,619	5,472	83	68	--	89	50	--	--
CHECK	GREENLEAF (SU)	--	4,537	4,412	77	64	--	81	55	--	--
CAL/WEST	CW 1-61-10 (SS)	--	4,315	6,373	83	66	--	85	54	--	--
MATURITY CHECK	PIPER (SU)	--	3,993	3,765	78	58	--	72	63	--	--
MOSS SEED	MEGA MIL (PM)	--	3,314	4,096	85	74	--	95	25	--	--
	Averages	--	5,054	5,773	81	67	--	84	53	--	--
	CV(%)	--	20	16	3	4	--	4	10	--	--
	LSD(0.05)**	--	1,699	1,546	3	5	--	5	8	--	--
TEST, OVERALL											
	Averages	6,027	--	--	77	--	--	85	57	--	--

* Grain Yield Rating: 0 - 5; 0 = no grain, 5 = >50 bu/acre potential.

** Unless two varieties differ by more than the L.S.D., little confidence can be placed in one being superior to the other.

*** SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

Hay type plots were divided in two, representing different management systems. Cut 1, August 19, maximized forage quality. Cut 2, September 23, maximized forage yield. Both cuts represent the entire season's growth to that point.

Table 4. Hays Summer Annual Forage Test, 2002.

BRAND	NAME	Forage Quality (dry matter basis)							
		Protein (%)		NDF (%)		ADF (%)		ADL (%)	
		Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2
FORAGE SORGHUM									
SEED RESOURCE	BMR100	6.3	--	49.2	--	30.6	--	6.0	--
SORG. PARTNERS	NK 300	6.2	--	54.8	--	32.1	--	7.4	--
GOLDEN HARVEST	SI GRO H-45	6.2	--	55.5	--	33.0	--	7.7	--
MOSS SEED	MILLENIUM BMR	6.0	--	41.7	--	31.0	--	4.1	--
SEED RESOURCE	FAME	6.0	--	41.3	--	32.1	--	5.0	--
MATURITY CHECK	EARLY SUMAC	5.8	--	43.5	--	27.5	--	5.3	--
TRIUMPH	SUPER SILE 20	5.6	--	55.6	--	33.0	--	7.3	--
STAR	EXP MV101LDP	5.5	--	52.4	--	32.1	--	7.0	--
SEED RESOURCE	BMR106	5.2	--	48.8	--	32.3	--	5.4	--
SORG. PARTNERS	1990	5.0	--	60.2	--	36.3	--	7.6	--
MOSS SEED	4EVER GREEN	4.7	--	60.6	--	36.8	--	7.1	--
MATURITY CHECK	ATLAS	4.3	--	53.7	--	33.4	--	6.5	--
SORG. PARTNERS	SS 405	3.6	--	56.3	--	33.9	--	7.6	--
	Averages	5.4	--	51.7	--	32.5	--	6.4	--
	CV(%)	19.5	--	7.2	--	4.7	--	12.5	--
	LSD(0.05)**	NS	--	6.2	--	2.5	--	1.3	--
HAY TYPES*									
SORG. PARTNERS	SORDAN HEADLESS (SS)	10.2	6.0	61.4	60.8	43.5	36.2	7.7	7.2
CAL/WEST	CW 1-63-1 (SS)	9.5	6.5	59.3	51.6	38.4	31.5	8.3	6.1
SORG. PARTNERS	TRUDAN HEADLESS (SU)	8.8	4.3	62.4	60.8	42.2	37.3	8.5	8.3
STAR	EXP NP100 (SS)	8.1	5.3	55.6	52.0	39.9	32.4	12.1	7.4
CHECK	GREENLEAF (SU)	8.1	4.7	61.2	58.1	40.7	37.9	10.1	8.7
CAL/WEST	CW 1-63-10 (SS)	8.1	5.9	62.0	52.8	41.5	33.7	8.1	6.5
SEED RESOURCE	SS200BMR (SS)	8.0	5.5	61.9	52.7	39.3	32.6	8.8	6.9
CAL/WEST	CW 1-61-1 (SS)	7.9	5.2	59.1	49.7	40.4	30.3	10.0	6.5
MOSS SEED	MEGA GREEN (SS)	7.8	5.3	61.0	59.6	42.4	35.0	10.1	7.3
MATURITY CHECK	PIPER (SU)	7.8	4.0	63.4	63.7	41.4	40.7	10.7	9.9
SEED RESOURCE	PS210BMR (SS)	7.7	5.8	58.8	59.3	41.6	35.5	10.9	7.2
CAL/WEST	CW 1-63-9 (SS)	7.5	5.3	59.1	51.7	40.4	33.0	10.3	6.5
MOSS SEED	MEGA MIL (PM)	7.5	6.1	59.9	59.1	42.5	36.6	8.4	6.0
MATURITY CHECK	NB280S (SS)	7.4	4.5	62.7	55.3	41.0	35.9	10.6	8.6
CAL/WEST	CW 1-61-9 (SS)	7.2	4.8	61.4	52.0	40.3	33.0	9.1	7.2
CAL/WEST	CW 1-61-10 (SS)	7.2	4.7	62.7	51.4	41.5	32.2	9.0	6.9
SORG. PARTNERS	TRUDAN 8 (SU)	7.0	4.5	61.9	53.2	40.1	35.8	10.4	8.2
MOSS SEED	CENTURY BMR (SS)	6.6	4.6	61.6	53.6	41.9	33.8	9.9	7.4
SORG. PARTNERS	SORDAN 79 (SS)	5.7	3.8	63.3	54.3	41.9	34.5	10.2	8.6
	Averages	7.8	5.1	61.0	55.4	41.1	34.6	9.6	7.5
	CV(%)	15.9	20.2	3.9	3.8	3.8	3.9	16.9	9.5
	LSD(0.05)**	2.1	NS	4.0	3.5	2.6	2.2	NS	1.2
TEST, OVERALL									
	Averages	6.8	--	57.3	--	37.7	--	8.3	--

* SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

Hay type plots were divided in two, representing different management systems. Cut 1, August 19, maximized forage quality. Cut 2, September 23, maximized forage yield. Both cuts represent the entire season's growth to that point.

** Unless two varieties differ by more than the L.S.D., little confidence can be placed in one being superior to the other.

Table 5. Colby Irrigated Summer Annual Forage Test, 2002.

BRAND	NAME	Forage				Grain Days		Ht. (in)	Lodg (%)	Stnd (%)	
		Yield (pounds DM/acre)		Moist. (%)		yield (bu/a)	to (blm)				
		Total	Cut 1	Cut 2	Cut 1	Cut 2					
FORAGE SORGHUM											
SORG. PARTNERS	NK 300	14,015	--	--	69	--	46	83	70	--	--
SORG. PARTNERS	1990	12,588	--	--	76	--	0	--	82	--	--
MOSS SEED	4EVER GREEN	12,454	--	--	75	--	0	--	81	--	--
WARNER	2-WAY F-145	11,257	--	--	71	--	0	93	90	--	--
SEED RESOURCE	FAME	10,285	--	--	67	--	36	66	67	--	--
SEED RESOURCE	BMR106	9,680	--	--	68	--	50	72	75	--	--
SEED RESOURCE	BMR100	9,401	--	--	75	--	33	75	83	--	--
MOSS SEED	MILLENIUM BMR	8,434	--	--	73	--	28	77	78	--	--
MATURITY CHECK	ATLAS	8,107	--	--	74	--	17	82	85	--	--
MATURITY CHECK	EARLY SUMAC	8,007	--	--	72	--	20	67	81	--	--
	Averages	10,423	--	--	72	--	23	77	79	--	--
	CV(%)	10	--	--	3	--	25	2	6	--	--
	LSD(0.05)**	1,724	--	--	3	--	10	3	8	--	--
HAY TYPES*											
MATURITY CHECK	NB280S (SS)	15,840	9,549	6,291	70	49	--	73	87	--	--
MATURITY CHECK	PIPER (SU)	14,798	8,850	5,949	67	46	--	74	85	--	--
SORG. PARTNERS	SORDAN HEADLESS (SS)	12,465	8,233	4,232	77	59	--	--	81	--	--
SORG. PARTNERS	TRUDAN HEADLESS (SU)	12,332	7,440	4,892	78	48	--	--	76	--	--
SEED RESOURCE	SS200BMR (SS)	11,123	6,745	4,378	75	50	--	79	78	--	--
MOSS SEED	MEGA GREEN (SS)	11,078	6,859	4,219	78	51	--	--	78	--	--
MOSS SEED	CENTURY BMR (SS)	11,073	6,291	4,782	73	48	--	81	77	--	--
SEED RESOURCE	PS210BMR (SS)	10,007	6,008	3,999	81	53	--	--	79	--	--
MOSS SEED	MEGA MIL (PM)	8,741	6,917	1,824	82	35	--	--	61	--	--
	Averages	11,940	7,432	4,507	76	49	--	77	78	--	--
	CV(%)	10	12	26	6	9	--	3	8	--	--
	LSD(0.05)**	2,120	1,589	2,019	8	8	--	4	10	--	--
TEST, OVERALL											
	Averages	11,141	--	--	74	--	--	77	79	--	--
2 - Year Averages											
FORAGE SORGHUM											
WARNER	2-WAY F-145	13,397	--	--	73	--	3	96	99	--	119
MATURITY CHECK	EARLY SUMAC	10,947	--	--	71	--	34	70	86	--	74
MATURITY CHECK	ATLAS	9,897	--	--	75	--	18	86	94	--	59
	Averages	11,689	--	--	73	--	27	81	88	--	85
HAY TYPES*											
MATURITY CHECK	NB280S (SS)	14,185	9,864	4,321	72	57	--	71	92	--	--
MATURITY CHECK	PIPER (SU)	13,474	9,168	4,306	67	51	--	73	89	--	--
	Averages	12,438	9,007	3,431	74	55	--	77	86	--	--
TEST, OVERALL											
	Averages	12,045	--	--	74	--	--	80	87	--	--

* SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

** Unless two varieties differ by more than the L.S.D., little confidence can be placed in one being superior to the other.

Table 6. Colby Irrigated Summer Annual Forage Test, 2002.

BRAND	NAME	Forage Quality (dry matter basis)							
		Protein (%)		NDF (%)		ADF (%)		ADL (%)	
		Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2
FORAGE SORGHUM									
SORG. PARTNERS	1990	6.7	--	64.6	--	39.8	--	8.4	--
MOSS SEED	4EVER GREEN	6.7	--	60.9	--	39.9	--	9.9	--
MATURITY CHECK	ATLAS	5.9	--	55.1	--	34.6	--	7.4	--
WARNER	2-WAY F-145	5.5	--	61.7	--	40.1	--	9.7	--
SEED RESOURCE	BMR106	5.4	--	54.2	--	36.6	--	8.9	--
SEED RESOURCE	FAME	5.3	--	55.2	--	39.0	--	9.7	--
SORG. PARTNERS	NK 300	5.3	--	57.9	--	39.0	--	9.6	--
SEED RESOURCE	BMR100	5.3	--	55.6	--	35.7	--	8.5	--
MATURITY CHECK	EARLY SUMAC	5.1	--	51.2	--	33.9	--	8.3	--
MOSS SEED	MILLENIUM BMR	4.3	--	57.0	--	38.8	--	8.8	--
	Averages	5.5	--	57.3	--	37.7	--	8.9	--
	CV(%)	15.6	--	3.9	--	5.3	--	14.9	--
	LSD(0.05)**	1.5	--	3.9	--	3.4	--	NS	--
HAY TYPES*									
MOSS SEED	MEGA MIL (PM)	7.9	--	61.1	--	39.7	--	8.1	--
SEED RESOURCE	SS200BMR (SS)	7.3	--	59.2	--	37.3	--	7.9	--
SORG. PARTNERS	SORDAN HEADLESS (SS)	7.1	--	63.0	--	41.6	--	9.5	--
SEED RESOURCE	PS210BMR (SS)	7.0	--	61.2	--	41.0	--	9.1	--
MOSS SEED	CENTURY BMR (SS)	7.0	--	59.6	--	37.3	--	8.2	--
MOSS SEED	MEGA GREEN (SS)	6.5	--	62.4	--	41.0	--	8.3	--
SORG. PARTNERS	TRUDAN HEADLESS (SU)	6.4	--	62.5	--	41.6	--	9.9	--
MATURITY CHECK	NB280S (SS)	5.9	--	61.4	--	40.5	--	10.0	--
MATURITY CHECK	PIPER (SU)	5.8	--	62.3	--	41.5	--	8.8	--
	Averages	6.8	--	61.4	--	40.2	--	8.9	--
	CV(%)	13.3	--	2.8	--	3.1	--	10.5	--
	LSD(0.05)**	NS	--	NS	--	2.1	--	1.6	--
TEST, OVERALL									
	Averages	6.1	--	59.3	--	38.9	--	8.9	--
2 - Year Averages									
FORAGE SORGHUM									
MATURITY CHECK	EARLY SUMAC	5.4	--	48.4	--	31.4	--	7.4	--
MATURITY CHECK	ATLAS	5.3	--	53.5	--	34.2	--	6.8	--
WARNER	2-WAY F-145	5.2	--	60.7	--	40.1	--	8.7	--
	Averages	5.5	--	54.7	--	36.0	--	7.6	--
HAY TYPES*									
MATURITY CHECK	NB280S (SS)	5.7	--	59.0	--	39.1	--	8.9	--
MATURITY CHECK	PIPER (SU)	4.5	--	63.6	--	42.6	--	8.8	--
	Averages	6.1	--	60.3	--	39.3	--	7.8	--
TEST, OVERALL									
	Averages	5.8	--	57.1	--	37.4	--	7.7	--

* SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

** Unless two varieties differ by more than the L.S.D., little confidence can be placed in one being superior to the other.

Table 7. 2002, Summer Annual Forages, 3 - Location Averages.

BRAND	NAME	Forage				Grain* Days		Ht. (in)	Lodg (%)	Std (%)	
		Yield (pounds DM/acre)		Moist. (%)		yield rating	to blm				
		Total	Cut 1	Cut 2	Cut 1						Cut 2
FORAGE SORGHUM											
SORG. PARTNERS	1990	9,418	--	--	76	--	0	98	69	0	112
MATURITY CHECK	ATLAS	8,121	--	--	72	--	3	88	73	2	81
SEED RESOURCE	BMR100	7,535	--	--	71	--	3	87	68	83	74
MATURITY CHECK	EARLY SUMAC	6,479	--	--	69	--	3	76	66	87	76
	Averages	8,136	--	--	70	--	3	86	67	49	81
HAY TYPES**											
MATURITY CHECK	NB280S (SS)	10,200	5,801	4,868	76	61	--	74	71	--	--
MATURITY CHECK	PIPER (SU)	10,101	5,283	4,037	73	57	--	73	73	--	--
SORG. PARTNERS	SORDAN HEADLESS (SS)	8,755	5,366	4,264	80	71	--	--	59	--	--
SORG. PARTNERS	TRUDAN HEADLESS (SU)	8,249	4,976	4,119	79	65	--	--	55	--	--
SEED RESOURCE	PS210BMR (SS)	7,538	5,031	4,339	81	69	--	--	61	--	--
	Averages	8,422	5,166	4,058	78	64	--	80	62	--	--
TEST, OVERALL											
	Averages	7,647	--	--	74	--	--	81	64	--	--

* Grain Yield Rating: 0 - 5; 0 = no grain, 5 = >50 bu/acre potential.

Table 8. 2002, Summer Annual Forages, 3 - Location Averages.

BRAND	NAME	Forage Quality (dry matter basis)							
		Protein (%)		NDF (%)		ADF (%)		ADL (%)	
		Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2	Cut 1	Cut 2
FORAGE SORGHUM									
SORG. PARTNERS	1990	6.4	--	62.6	--	38.1	--	8.2	--
SEED RESOURCE	BMR100	6.0	--	54.3	--	34.3	--	8.5	--
MATURITY CHECK	EARLY SUMAC	5.7	--	50.0	--	31.8	--	7.7	--
MATURITY CHECK	ATLAS	5.6	--	54.5	--	34.4	--	7.4	--
	Averages	5.6	--	55.8	--	35.7	--	8.4	--
HAY TYPES**									
SORG. PARTNERS	SORDAN HEADLESS (SS)	9.1	8.1	60.4	59.6	38.4	34.3	7.5	5.9
SORG. PARTNERS	TRUDAN HEADLESS (SU)	8.6	6.9	60.6	60.0	38.2	35.3	8.0	7.1
SEED RESOURCE	PS210BMR (SS)	8.6	8.5	58.6	59.0	38.2	34.5	8.1	5.8
MATURITY CHECK	NB280S (SS)	8.0	6.8	59.9	57.3	37.1	35.2	8.7	7.2
MATURITY CHECK	PIPER (SU)	7.7	5.8	61.0	62.3	38.1	38.9	8.5	8.7
	Averages	8.3	7.4	59.5	56.9	37.1	34.0	7.8	6.5
TEST, OVERALL									
	Averages	7.0	--	57.9	--	36.7	--	8.2	--

** SS = Sorghum-sudan hybrid, SU = Sudan, PM = Millet.

Cut 2 forage quality results averaged over 2 locations: Hutchinson and Hays.

APPENDIX: Entrants in the 2002 Kansas Summer Annual Forage Performance Tests.

Brand/Company/Address Crop - Hybrid	Traits	Maturity	Brand/Company/Address Crop - Hybrid	Traits	Maturity
CAL/WEST			SORG. PARTNERS		
Cal/West Seeds Rt 1 Box 70 West Salem, WI 54669 608-786-1554			Sorghum Partners, Inc. Box189, 403 S Monroe New Deal, TX 79350 806-746-5566 sorghum-partners.com		
SS - CW 1-61-1	BMR	M	FS - 1990	--	PS
SS - CW 1-61-10	BMR	M	FS - NK 300	--	M
SS - CW 1-61-9	BMR	M	FS - SS 405	--	L
SS - CW 1-63-1	BMR	M	SS - SORDAN 79	--	M
SS - CW 1-63-10	BMR	M	SS - SORDAN HEADLESS	--	PS
SS - CW 1-63-9	BMR	M	SU - TRUDAN 8	--	M
GOLDEN HARVEST			SU - TRUDAN HEADLESS		
JC Robinson Seed Co 100 JC Robinson Blvd. Waterloo, NE 68069 402-289-6527 goldenharvestseeds.com			STAR Star Seed 101 Industrial Ave Box 228 Osborne, KS 67473 785-346-5447 starseed1.com		
FS - SI GRO H-45	--	M	FS - EXP MV101LDP	BMR	L
SS - RE GRO H-33	--	M	SS - EXP NP100	BMR	L
MIDLAND			TRIUMPH		
Kauffman Seeds 7508 S Mayfield Rd Haven, KS 67543 800-634-2836			Triumph Seed Co Inc PO Box 1050 Hwy 62 Bypass Ralls, TX 79357 800-530-4789 triumphseed.com		
FS - R+S	--	M	FS - SUPER SILE 20	--	ML
FS - TOP NOTCH	BMR	M	VALLEY PREMIUM		
SS - KRITTER KANDY	BMR	M	Valley Feed & Seed Inc 11916 S HWay 17 Hutchinson, KS 67501 620-662-4808		
SS - SUPER SIOUX	--	M	FS - UDDER BUSTER BMR	BMR	M
MOSS SEED			SS - SW. CHIEF X-TRABMR	BMR	ME
Walter Moss Seed Co. PO Box 21114 Waco, TX 76702-1114 254-840-4774			SS - SWEET CHIEF X-TRA	--	ME
FS - 4EVER GREEN	PS	L	WARNER		
FS - MILLENIUM BMR	BMR	L	Warner Seeds, Inc. Box 1877 Hereford, TX 79045 806-364-4470		
PM - MEGA MIL	PS	M	FS - 2-WAY BMR	BMR	M
SS - CENTURY BMR	BMR	L	FS - 2-WAY F-145	SS	L
SS - MEGA GREEN	PS	L	SEED RESOURCE		
Seed Resource P.O. Box 326 505 East Service Rd. Tulia, TX 79088 806-995-3882			FS - BMR100		
FS - BMR106			BMR		
FS - FAME			--		
SS - PS210BMR			BMR		
SS - SS200BMR			BMR		

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The URL is <http://www.ksu.edu/kscpt>.

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