

Forage Research in Texas, 1992

Sorghum-Sudangrass Performance Trial at Stephenville, 1991

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Summary

Twelve commercial sorghum-sudangrass hybrids were evaluated for dry matter (DM) yield, morphological composition, and forage quality at the Texas A&M University Research and Extension Center at Stephenville in 1991. Each hybrid was harvested four times. At harvests 1 and 2, plants were separated into leaf blades and stalks, and crude protein (CP) and acid detergent fiber (ADF) were determined on whole plants. Total DM yield for the season ranged from 9,300 to 11,800 lb DM/A and averaged 10,494 lb DM/A. The hybrids 'Greentreat II', 'Greentreat III', 'Grazex', 'Grazex II', and '8096G' were highest yielding. Differences in CP and ADF among hybrids were few.

Introduction

Sorghum-sudangrass hybrids are widely used for grazing and hay production in Texas. We evaluated 12 commercial hybrids for yield, leaf and stalk proportions, and forage quality during 1991 at Stephenville.

Keywords: summer-annual grasses / hay yields / forage quality.

Procedures

The performance trial was conducted at the Texas A&M University Research and Extension Center at Stephenville. The soil at the site is a Windthorst fine sandy loam.

Entries were solicited from various seed companies and a \$100 fee was charged for each entry. There were 12 entries from 7 companies. Entries were planted at 8 lb of seed/A on April 29 in two-row plots 30 ft long with 36 in. between rows. Each entry was planted in four replicate plots. Plots received 180 lb nitrogen (N), 70 lb phosphate (P_2O_5), and 10 lb zinc sulfate ($ZnSO_4$)/A before planting. An additional 75 lb N/A was applied after the first harvest. Rainfall was 2.3 in. in April, 4.4 in May, 3.0 in June, 0.9 in July, 6.6 in August, and 4.8 in September. No rain fell between harvest 1 and harvest 2 (June 17 to July 23).

Plots were harvested on June 17, July 23, August 20, and September 26, when plants were near boot stage. At each harvest, a 10-ft section of each row was hand-cut at a 4-in. height and weighed. A subsample of five plants was chopped in a garden mulcher, and a 1-lb sample of the chopped material was dried at 140 °F for 48 hours. A second subsample of eight plants was separated

into leaf blades and stalks. Individual plant parts were dried at 140 °F for 48 hours. Whole plants from harvests 1 and 2 were analyzed for CP and ADF with a calibrated near infrared reflectance spectrometer. The experimental design was a randomized complete block with four replications. The protected least significant difference (LSD) test was used to compare hybrid means.

Results and Discussion

The hybrids Greentreat II, Greentreat III, Grazex, Grazex II, and 8096G yielded the most DM during the season (Table 1). Yields were greatest at harvest 1 and least at harvest 3. Even though no rain fell between harvests 1 and 2, yields were relatively high at harvest 2. Hybrids did not differ signifi-

Table 1. Dry matter yield of 12 sorghum-sudangrass hybrids at Stephenville in 1991.

Hybrid†	June 17	July 23	August 20	September 26	Total
DM (lb/A)					
HS-91-ST	4202	2292	1659	1844	9998
SG-91-1	3950	2203	1493	1971	9617
SX-17	3930	1892	1560	1925	9307
Cowhand III	3682	2314	1565	1789	9350
Sucrosse S-2	4061	2248	1235	2004	9548
Greentreat III	4495	2591	1687	2712	11485
Grazex	4678	3033	1805	2116	11632
Greentreat II	4599	2582	1756	2837	11773
8096G	4468	2917	1825	2512	11721
9110G	4227	2828	1522	1870	10448
9432G	3578	2062	1438	2220	9298
Grazex II	4590	2874	1642	2647	11753
Mean	4205	2486	1599	2204	10494
LSD* (0.05)	654	585	ns	628	1301
C.V.‡ (%)	10.8	16.4	16.5	17	9

† Company and address: HS-91-ST and SG-91-1, Riley Yieldmaster Seed Corp., HCR 2 Box 59, Hart, TX 79043; Cowhand III, Western Heritage Seed Co., Box 756, Winters, TX 79567; Sucrosse S-2, George Warner Seed Co., P.O. Box 1877, Hereford, TX 79045; Greentreat II and III, Research Seeds, Inc., RR 2 Box 65, Webster City, IA 50595; Grazex and Grazex II, Sharp Bros. Seed Co., Box 140, Healy, KS 67850; SX-17, Dekalb Plant Genetics, Rt. 2 Box 56, Lubbock, Texas 79415; 8096G, 9110G, 9432G, Crosbyton Seed Co., P. O. Box 429, 306 East Main, Crosbyton, TX 79322.

*LSD = least significant difference at the 5% probability level.

‡C.V. = coefficient of variation.

Table 2. Leaf and stalk proportions of 12 sorghum-sudangrass hybrids at 3 harvests in 1991 at Stephenville.

Hybrid	June 17		July 23		August 20	
	Leaf	Stalk	Leaf	Stalk	Leaf	Stalk
percentage of whole plant dry matter						
HS-91-ST	38.9	61.1	45.6	54.4	42.6	57.4
SG-91-1	33.8	66.2	35.4	64.6	40.2	59.8
SX-17	36.4	63.6	51.3	48.7	44.1	55.9
Cowhand III	30.9	69.1	35.8	64.2	40.2	59.8
Sucrosse S-2	26.1	73.9	38.8	61.2	43.6	56.4
Greentreat III	33.4	66.6	41.9	58.3	41.6	58.4
Grazex	32.9	67.1	38.0	62.1	41.0	59.1
Greentreat II	31.3	68.7	41.9	58.1	42.8	57.1
8096G	32.4	67.6	38.7	61.3	43.1	56.9
9110G	31.6	68.4	37.2	62.8	43.5	56.5
9432G	34.5	65.5	46.0	54.0	44.7	55.3
Grazex II	34.2	65.8	34.6	65.4	42.9	57.1
Mean	33	67	40.4	59.6	42.5	57.5
LSD† (0.05)	ns	ns	5.7	5.7	2.9	2.9
C.V.‡ (%)	14.1	7	9.8	6.6	4.7	3.5

†LSD = least significant difference at the 5% probability level.

‡C.V. = coefficient of variation.

cantly in leaf and stalk percentage at harvest 1, but showed differences at harvests 2 and 3 (Table 2). The hybrids 'SX-17', '9432G', and 'HS-91-ST' had the highest leaf percentages at harvest 2. Grazex II, 'Cowhand III', and SG-91-1 had the lowest leaf percentages in harvest 2. Leaf percentages were higher in harvest 3 and also showed fewer differences among hybrids. The hybrids SG-91-1 and Cowhand III had the lowest leaf percentages at harvest 3.

At harvest 1, hybrids had no significant differences in ADF but differed in CP (Table 3). Cowhand III had the highest CP, whereas SX-17 had the lowest CP. Few differences existed among the remaining hybrids. At harvest 2, Grazex II had the lowest CP, whereas Greentreat II had the highest. Differences in ADF at harvest 2 were few; Greentreat II and hybrid 9432G had the lowest ADF.

Table 3. Crude protein and acid detergent fiber in whole plants of 12 sorghum-sudangrass hybrids in 2 harvests at Stephenville in 1991.

Hybrid	June 17		July 25	
	Crude protein	Acid detergent fiber	Crude protein	Acid detergent fiber
.....percentage of dry matter				
HS-91-ST	13.3	36.4	9.3	30.8
SG-91-1	12.8	37.3	9.3	30.8
SX-17	11.9	37.1	9.4	30.3
Cowhand III	14.0	35.8	10.3	30.3
Sucrosse	13.0	36.5	10.1	30.0
Greentreat III	12.0	38.1	9.8	29.5
Grazex	12.6	36.8	9.5	29.4
Greentreat II	13.0	36.8	10.4	28.8
8096G	13.1	36.4	9.7	30.9
9110G	12.2	38.7	10.0	29.4
9432G	13.5	35.5	10.3	28.5
Grazex II	12.5	37.7	9.0	30.7
Mean	12.9	36.9	9.7	30.0
LSD* (0.05)	1.06	ns	0.81	1.3
C.V.† (%)	5.7	3.7	5.8	3.0

*LSD = least significant difference at the 5% probability level.

†C.V. = coefficient of variation.