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Forage Yield and Crude Protein Content of Sudan-Sorghum Hybrids

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Summary

Yields of sudan-sorghum hybrids ranged from 1.78 to 4.53 tons dry matter/A at 25-50 percent booting with few statistical differences among 20 hybrids. Yields at second booting ranged from 0.7 to 1.2 tons/A, but were not statistically different. Crude protein content ranged from 5.9 to 9.4 percent and 6.7 to 9.3 percent, respectively, in forage of the first and second cutting with statistical differences among hybrids. Most hybrids reached first booting 55 to 63 days after seeding. Regrowth reached boot stage in 35 to 43 days. Rainfall was below normal for this study.

Introduction

Hybrids of sorghum and sudangrass are available to the producer in vast numbers and with appreciable

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variation in seed price. Previous studies have shown variation in yield and crude protein content of these hybrids. Since they are used for hay and grazing for beef and dairy animals in much of Texas, it is important to know yield potential and quality. The objective of this study was to determine forage yield, crude protein, and in vitro dry matter digestibility for locally available hybrids of varying seed price.

Procedure

Twenty hybrids of *Sorghum bicolor* (L.) Moench were seeded on Windthorst fine sandy loam on May 4, 1984 to provide a population of 12 plants per foot of row. Plots were 15.5-feet long with four rows spaced 15 inches. Four replications were used in a randomized complete block design. The test area was fertilized March 8 with 130 and 270 lb/A of 18-46-0 and urea, respectively, to provide a total of 148-60-0 lb/A N-P₂O₅-K₂O).

Each hybrid was harvested when 25 to 50 percent of the plants reached boot stage; all replications of each hybrid were cut on the same day. Plants were cut with a machete from 10 feet of each of the two row centers at a height of 3 inches. Harvested plants were weighed and subsamples taken and dried at 70°C for dry matter determination. The entire plot area was subsequently mowed to a height of 3 inches and all plant material removed. Yield of regrowth was determined the same as for the first cutting except that drought conditions forced earlier harvest. Two replications were cut 3 to 14 days prior to booting when it appeared that the plots might be desiccated by lack of rainfall and never reach boot stage. Plants in the two remaining replications were harvested when 5-10 percent were booting. Although the mean yield of the latter cutting was 0.24 tons/A greater than the earlier cutting and the mean crude protein content was 1.54 percent lower, the date effect was not statistically analyzed.

Crude protein was determined by the Kjeldahl method. In vitro dry matter digestibility determinations were not completed for this report.

Results and Discussion

Dry matter yields ranged from 1.78 to 4.53 and from 0.7 to 1.2 tons/A in the first and second harvests, respectively (Table 1). 'Thrifty Grazer', 'SX-17+', and 'Ribbon Grazer' produced statistically higher yields than 'Trudan 8' at the first cutting. There were no other significant differences among hybrids. Yields of regrowth were not significantly different. SX-17+ produced 4.53 tons dry matter/A at the first cutting, but remained longer in the vegetative stage than other hybrids and did not reach boot stage again.

Crude protein content ranged from 5.9 to 9.4 percent and from 6.7 to 9.7 percent in forage of the first and second harvests, respectively (Table 1). 'Kow Kandy' and Trudan 8 forage exceeded 9 percent crude protein content at the first cutting and was statistically greater than SX-17+ and 'Cadan 99B'. Crude protein content of Trudan 8 and 'Dine-A-Mite' exceeded 9 percent at the

TABLE 1. DRY MATTER YIELD AND CRUDE PROTEIN CONTENT OF SUDAN-SORGHUM HYBRIDS

Hybrid	Tons Dry Matter Per Acre ¹		Percent Crude Protein ¹	
	1st Cut	2nd Cut	1st Cut	2nd Cut
SX-17+ Thrifty Grazer	4.53 a	2	5.9 d	2
Ribbon Grazer	3.44 a	1.1 a	8.4 abc	8.7 abcd
XSG-13	2.95 ab	1.2 a	8.6 abc	7.9 cde
Kow Kist Cattle	2.85 abc	1.0 a	8.4 abc	8.8 abc
King	2.77 abc	1.0 a	8.1 abc	8.8 abc
Sugraze	2.77 abc	1.1 a	7.9 bc	6.7 e
Cadan 99B	2.76 abc	1.0 a	8.2 abc	8.4 abcd
Kow Kandy	2.63 abc	0.8 a	7.3 c	8.6 abcd
Grow-N- Graze	2.54 abc	0.7 a	9.4 a	7.4 de
MorGain III	2.52 abc	1.0 a	8.4 abc	7.9 cde
TE Hay- grazer II	2.50 abc	0.9 a	8.5 abc	8.1 bcd
Got-Cha	2.48 abc	0.9 a	8.7 ab	8.7 abcd
Dine-A- Mite	2.44 abc	0.9 a	8.4 abc	8.5 abcd
TE Chieftan- A	2.42 abc	0.8 a	8.8 ab	9.3 ab
DoMoR	2.40 abc	0.7 a	8.9 ab	8.3 bcd
Stockman's Pride	2.36 abc	0.7 a	8.3 abc	8.7 abc
Cattle Grazer	2.34 bc	0.8 a	8.4 abc	8.2 bcd
HS-301A	2.29 bc	1.0 a	8.3 abc	8.9 abc
Trudan 8	2.09 bc	0.9 a	8.3 abc	7.9 cde
	1.78 c	1.0 a	9.1 ab	9.7 a

¹Values within a column followed by the same letter are not statistically different at the 0.05 probability level. Date effects for the second harvest were not analyzed.

²SX-17+ had no regrowth.

second cutting being statistically greater than Kow Kandy, 'Cattle King', 'Grow-N-Graze', 'HS-301A', and Ribbon Grazer. Crude protein of Trudan 8 was also significantly greater than that of 'TE Chieftan-A', 'Stockman's pride', and 'MorGain III'. Hybrids with relatively high crude protein content generally had relatively lower yields.

Days from planting to 25-50 percent booting ranged from 55 for Trudan 8 to 88 for SX-17+ (Table 2). All other hybrids reached booting between 59 and 63 days after planting. Regrowth of Trudan 8 reached boot stage 35 days from the first cutting. Other hybrids reached the second booting between 40 and 43 days following first harvest. SX-17+ did not reach boot stage after the first cutting.

Rainfall was abnormally low during the period of this study. Consequently, 1.5 acre-inches of irrigation was applied on June 15 in order to prevent firing of leaves and to stimulate growth. For the first cutting Trudan 8 received 2.78 inches, SX-17+ received 4.88, and all others received 3.4 inches of rainfall. If the test had received the average rainfall of the past 45 years, SX-17+ would have received 9.49 inches and all others would have received approximately 7.29 inches. For the second cutting, Trudan 8 received 2.10 inches of rainfall because of earlier maturity, while other hybrids received only 1.65 inches.

TABLE 2. NUMBER OF DAYS REQUIRED TO REACH BOOTING STAGE OF HAY TYPE SUDAN-SORGHUM HYBRIDS

Sorghum Hybrid	Seed Company	Days to Booting	
		First Cut	Second Cut*
Trudan 8	Northrup King	55	35
TE Chieftan-A	Taylor-Evans	59	41
Got-Cha	Harpool	59	41
Dine-A-Mite	Conlee	59	42
Cattle King	Lewis Barker	59	42
TE Haygrazer II	Taylor-Evans	60	40
Ribbon Grazer	Crop Seed	60	42
MorGain III	Conlee	60	42
Stockman's Pride	R.C. Young	60	43
Sugraze	R.J. Riley	60	42
XSG-13	Pioneer	60	40
DoMoR	Conlee	61	42
Thrifty Grazer	Crop Seed	61	41
Cattle Grazer	KanTex	61	40
Grow-N-Graze	George Warner	61	42
HS-301A	Harpool	61	40
Kow Kandy	R.C. Young	62	41
Kow Kist	Harper	62	41
Cadan 99B	Browning	63	40
SX-17+	DeKalb-Pfizer	88	—

*Mean days for two replications cut in late vegetative state and two replications cut at approximately 10 percent booting.