

Forage Research in Texas

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Performance of Sorghum-Sudan Hybrids Grown Dryland

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Summary

Eighteen hybrids of sorghum X sudangrass [Sorghum bicolor (L.) Moench] were grown dryland on Windthorst fine sandy loam. The first seeding April 13, 1983 resulted in a very poor stand due to cool soil temperature. Yields of the May 9 seeding ranged from 2.14 to 4.11 tons per acre when cut once at the boot stage. Yield of SX-17+ at 4.11 tons was significantly greater than all other cultivars, but SX-17+ required thirteen days longer to reach boot stage than eight other hybrids. Daily growth rate among the hybrids was not significantly different.

Crude protein content ranged from 7.27 to 10.54 percent. Six hybrids contained significantly more crude protein than four others. Highest yielding hybrids did not contain the higher percentages of crude protein.

Plants surviving at harvest as a percentage of seed planted ranged from 40 to 82 despite germination percentages exceeding 82%. No difference in survival of hybrids could be determined statistically.

Introduction

Hybrids of sorghums X sudangrass have been shown to provide acceptable yields and crude protein content when properly managed. They are extensively used for grazing and hay for both dairy and beef animals. Hybrids resulting from crossing sorghum and sudangrass are very common offering the producer an array of choice with considerable variation in seed price. The purpose of this study was to assess the yield and protein content of forage of several of the hybrids available in the Stephenville, Texas area.

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Key words: Sorghum-sudan hybrids/Sorghum bicolor/sorghum X sudangrass/crude protein/forage yield/soil temperature

Procedure

Eighteen hybrids (Table 1) of [*Sorghum bicolor* (L.) Moench] were seeded April 13 and reseeded May 9, 1983 on Windthorst fine sandy loam near Stephenville at a rate of one seed per row inch. All hybrids were types generally used for hay or grazing. Fertilizer was broadcast April 7 at the rate of 148-48-48 and incorporated by disking. Plots were replicated four times in a randomized, complete-block design. Plots sixteen feet long had four rows spaced at fifteen inches. Soil temperature was monitored six inches below ground level from April 15 to May 27.

Individual hybrids were cut once when 25-50% of the plants had reached the boot stage of maturity. Four feet of the two center rows of each plot were cut at a height of three inches with a machete for yield determination. Subsamples were dried at 158F for dry matter determination and retained for crude protein analysis.

Seed germination was determined for fourteen of the eighteen hybrids. Fifty seed of each hybrid were placed on a paper towel, moistened, and stored in the dark inside a sealed plastic bag at 72F for seven days. Each seed was counted as germinated if it produced a radical.

Number of plants per eight feet of row was determined at harvest. Percentage of plants surviving at harvest was determined by dividing plants per eight row-feet by number of seed planted per eight row-feet.

Results and Discussion

The first planting on April 13 resulted in a very poor stand even though soil moisture was adequate. Daily minimum soil temperature was below 60F until April 27 (Figure 1). Daily maximum soil temperature increased from 59F to 69.5F April 15-19, but dropped and remained below 67F until April 27. A second seeding May 9 resulted in a good stand. Minimum soil temperature at six inches depth exceeded 60F until May 15 when most plants had emerged. Maximum daily soil temperatures following seeding were 70F or more except for one day. Cool soil temperature was apparently responsible for poor germination of the first seeding.

Yields ranged from 2.14 to 4.11 tons dry matter per acre (Table 1). However, under the conditions of this test all yields were statistically the same except for 'SX-17+', which produced yields statistically greater than all other hybrids. SX-17+ required 69 days to reach boot stage while eight cultivars required only 56 days from seeding until harvest. Mean yield of hybrids requiring 63 days to reach boot stage was only 0.19 tons/acre greater than the mean yield of hybrids requiring 56 days. Rainfall was the same as the average for the period 1938-1979 and totaled 5.85 inches from planting to harvest. SX-17+ received 0.97 inches more rainfall due to its longer maturity.

Daily growth rate ranged from 77.0 to 128.5 pounds dry matter per day, but differences could not be detected statistically at the 0.05 level (Table 1). Mean daily growth rate for all hybrids was 96.44 pounds dry matter per acre.

Percent crude protein content ranged from 7.27 to 10.54 (Table 2). 'TE Haygrazer II', 'Trudan 8', 'Sugraze', 'TE Chieftian-A', 'Morgain III', and 'Cattle Grazer' contained significantly higher amounts of crude protein than 'Grow-N-Graze', 'SX-17+', 'Ribbon-Grazer', and 'Kow Kist'. The fact that the latter four cultivars produced higher (though not significantly higher) yields than the former six hybrids points to the compromise that must often be made between producing high yields and high crude protein content.

Plant survival at harvest appeared to be low compared with the percentage of germinating seed determined before seeding (Table 2). Many plants apparently were lost for reasons other than germination. Although the percentage of plants surviving ranged from 40 to 82, differences among cultivars were not found to be statistically significant.

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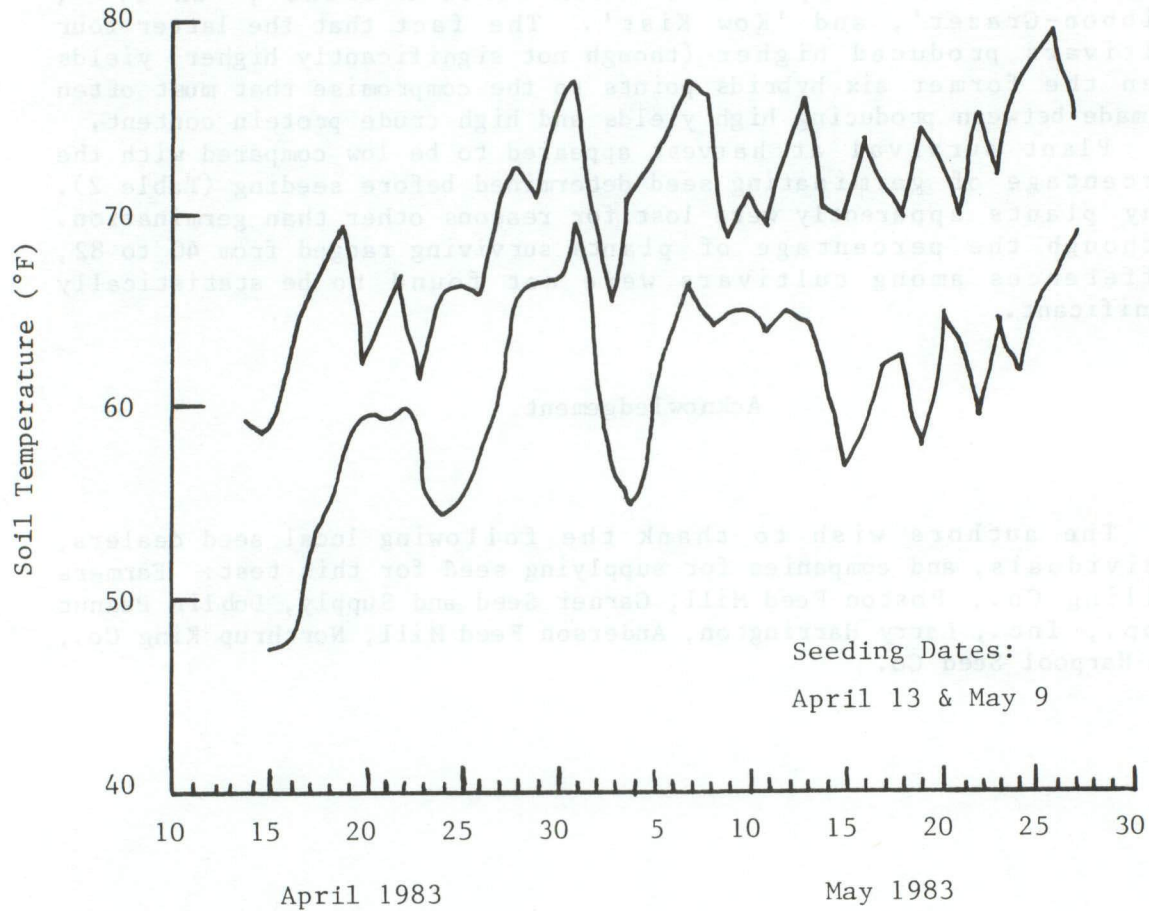


Figure 1. Daily maximum and minimum soil temperatures at six inches depth

TABLE 1. DRY MATTER YIELD, GROWTH RATE, CRUDE PROTEIN CONTENT, HARVEST DATE, AND AGE AT HARVEST OF SORGHUM X SUDANGRASS HYBRIDS GROWN DRYLAND ON WINDTHORST FINE SANDY LOAM

Cultivar	Dry Matter*		Growth Rate** lbs/day	Crude Protein* %	Harvest Date	Age at Harvest 1/
	Total Tons/Ac					
TE Haygrazer II	2.27 b		90.7	10.54 a	July 5	56
Trudan 8	2.15 b		95.6	10.41 ab	July 1	52
Sugraze	2.14 b		85.5	9.86 abc	July 5	56
TE Chieftian-A	2.53 b		101.3	9.65 abc	July 5	56
Morgain III	2.37 b		94.5	9.62 abc	July 5	56
Cattle Grazer	2.49 b		99.6	9.61 abc	July 5	56
Stockman's Pride	2.50 b		100.0	9.24 abcd	July 5	56
Cattle King	2.50 b		100.0	9.16 abcd	July 5	56
HS-101	2.27 b		85.7	8.84 bcde	July 8	59
HS-301 A	2.20 b		77.0	8.81 bcde	July 12	63
Gotcha	2.57 b		96.8	8.71 cde	July 8	59
Kow Kandy	2.71 b		95.2	8.63 cde	July 12	63
XSG-13	2.64 b		105.4	8.63 cde	July 5	56
Thrifty Grazer	2.85 b		99.8	8.18 cde	July 12	63
Grow-N-Graze	2.44 b		85.6	7.96 de	July 12	63
SX-17+	4.11a		128.5	7.89 de	July 19	69
Ribbon Grazer	2.63 b		92.2	7.87 de	July 12	63
Kow Kist	2.92 b		102.5	7.27 e	July 12	63

* Means followed by the same letter are not significantly different at the 0.05 level, Duncan's Multiple Range Test.

** Growth rate was not significantly different at the 0.05 probability level.

1/ Days since seeding.

TABLE 2. SEED GERMINATION AND PERCENT OF SEEDING RATE SURVIVING AS PLANTS AT HARVEST

Cultivar	Company	Germination %	% Plants Surviving at Harvest*
Kow Kandy	R. C. Young	94	82
TE Haygrazer II	Taylor-Evans	94	59
TE Chieftian-A	Taylor-Evans	92	73
SX-17+	DeKalb-Pfizer Genetics	90	72
Ribbon Grazer	Crop Seed	90	70
Kow Kist	Harper	88	66
Thrifty Grazer	Crop Seed	88	64
Morgain III	Conlee	87	63
Stockman's Pride	R. C. Young	86	64
Cattle Grazer	Kan Tex	86	60
Grow-N-Graze	George Warner	86	56
XSG-13	Pioneer	85	79
Cattle King	Lewis Barker	85	71
Sugraze	R. J. Riley	82	46
HS-101	Harpool	--	46
Gotcha	Harpool	--	81
HS-301 A	Harpool	--	40
Trudan 8	Northrup King	--	60

* Based on seeding rate of one seed per row inch. Differences are not significantly different at the 0.05 probability level.