Forage Research in Texas

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Department of Soil and Crop Sciences

BV-0072

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Location: Stephenville

DRY MATTER YIELDS AND QUALITY OF HYBRID BERMUDAGRASSES

OBJECTIVE:

To compare yields and quality of forage produced by new bermudagrass hybrids with that of Coastal and Coastcross-1 bermudagrasses.

PROCEDURE:

Nine hybrid bermudagrasses were transplanted from the greenhouse May 14, 1975. Four irrigations of 3/4 acre-inch each were applied through August 7 to insure survival of the plants. Rainfall was about 6 inches below normal for the growing season. A randomized complete-block design with four replications was used. Weeds were controlled with simazine.

Fertilizer rates and harvest dates varied slightly, while rainfall varied considerably throughout the five years (Table 1). Fertilizer nitrogen was supplied as ammonium nitrate, phosphorus as triple superphosphate, and potassium as muriate of potash. Phosphorus and potassium were applied in March or April usually with the first nitrogen application. Nitrogen was not applied until August 6 of the establishment year. Fifty pounds N/acre was applied in 1976 prior to the first and after each harvest. In 1977 and 1978 100 lbs. N/acre was applied prior to the first and after each harvest. Fifty pounds N per acre was applied prior to the first harvest and 100 lbs. N/acre was applied after the first harvest in 1979.

Ground cover ratings were made May 3, 1977, April 13, 1978, and May 11, 1979 to determine extent of die-back due to winterkilling. Ratings based on percentage of individual plots covered by green grass were made at least two weeks after growth began in the spring.

Dry matter yields were determined by cutting the forage from the center 3 x 12 ft. portion of the 6 x 12 ft. replicated plots. Cutting height was two inches. Harvest was usually made just prior to formation of infloresences; however, Oklan formed seed heads 7-10 days earlier than other hybrids.

In vitro dry matter disappearance was determined on duplicate samples of forage from all four replications of three harvests in 1975 and 1976.

RESULTS AND DISCUSSION:

Dry matter yields in the first year of the five-year study reflect the vigor of some of the new hybrids as compared with Coastal (Table 1). Callie produced significantly higher yields than any other bermuda. Hybrids S-16 and Hill Farm Coastcross-1 had yields approximately 500 lb./acre less than Callie. Yield of Coastal was significantly less than S-16. However, in 1976 yields of Callie were significantly less than Coastal, S-16, S-54, and Oklan. Coastal yields were statistically greater than all hybrids in 1979 and in 1977 except for Coastcross-1. Only S-61, Oklan, and SS-16 had yields statistically lower than Coastal in 1978.

Hybrid S-16 produced 95% as much dry matter per acre as Coastal (Table 2). Hybrids SS-16 and S-61 produced only 73% and 72%, respectively. Other hybrid yields ranged from 81-88% of Coastal.

Ground coverage in early spring was not entirely related to yield. Hybrids SS-16 and S-61, two hybrids which rated about the same as Coastal, produced much less forage than Coastal (Table 3). Hybrid S-16 rated only 53% ground cover over the three years, yet forage yields were 95% of those of Coastal. In contrast, SS-16 had a 2% greater ground cover than Coastal yet yields were only 75% of those of Coastal over the five years. Apparently less winter hardy hybrids made rapid recovery to produce yields from 82-95% of those of Coastal.

In vitro dry matter disappearance of 64.0% and 62.9% for Coastcross-1 and Callie, respectively, placed them above all other hybrids (Table 4). (Hill Farm Coastcross-1 has been judged to be Coastcross-1). All hybrids were as high as Coastal in IVDMD except Oklan, which may not be statistically lower.

Table 1. Record of fertilizer application, harvest dates, rainfall, and winter temperatures for bermudagrass test at Stephenville, 1975-1979.

1975	1976	1977	1978	1979
Pounds $N-P_2O_5-K_2O$ Per Acre				
100-40-0	150-80-160	300-40-0	200-80-160	150-0-0
Dates of Harvest				
7/8,8/5,9/18	6/9,7/23,10/18	5/24,7/8,9/15	5/31,9/18	6/29,9/14
Acre-Inches of Rainfall Received from April-September				
11.91	24.54	18.44	17.87	20.55
Mean January Temperatures (^oF)				
37.23	32.00	23.32	23.29	25.19
Total Number of Days with Temperatures $\leq 15^oF$				
	2	8	9	10

Table 2. Dry matter forage yields of hybrid bermudagrasses grown at Stephenville, 1975-1979.

Hybrid	% of Coastal*	Pounds Dry Matter Per Acre				
		1975	1976	1977	1978	1979
Coastal	100	1513c**	3428ab	2950	4677a	4167a
S-16	95	1995b	3606a	2469bc	4420ab	3378b
S-61	72	1079d	1864e	1826e	3939bc	3321bc
Oklan	81	815de	3259abc	2441bc	3756bc	3278bc
SS-16	73	632e	2909cd	1975de	3473c	3251bc
Coastcross-1	88	1574c	2854cd	2694ab	4431ab	3242bc
Callie	84	2390a	2647d	1672e	4357ab	2943cd
Hill Farm Coastcross-1	86	1940b	2932cd	2421bc	4264ab	2914cd
S-54	82	1726bc	3132bc	2170cd	4231ab	2554d

*Computed on total production for five years

**Means within a year not followed by the same letter are significantly different at the 0.05 level, Duncan's NMR test.

Table 3. Ground cover ratings of hybrid bermudagrasses made in early spring of three years.

Hybrid	1977	1978	1979	Mean
SS-16	100	100	96	99
Coastal	100	90	100	97
S-61	100	90	90	93
Oklan	99	83	39	74
Callie	89	70	14	58
Coastcross-1	81	68	19	56
Hill Farm Coastcross-1	85	64	11	53
S-16	80	64	16	53
S-54	95	52	8	52

Table 4. *In Vitro* dry matter disappearance percentages of nine hybrid bermudagrasses grown at Stephenville.

	1975			1976			2-Yr.	% of
	July 8	Aug. 5	Sep. 18	June 9	July 23	Oct. 18	Mean	Coastal
Coastal	61.4	61.0	61.7	58.9	59.1	60.2	60.4	100
S-16	61.6	65.6	60.6	60.1	64.2	58.8	61.8	102
S-61	62.8	61.1	60.0	59.4	59.5	57.8	60.1	100
Oklan	60.4	65.5	52.5	57.8	63.8	52.5	58.7	97
SS-16	62.8	64.3	61.0	58.9	59.6	56.2	60.5	100
Coastcross-1	65.4	66.7	63.1	62.3	65.0	61.7	64.0	106
Callie	62.3	67.0	61.9	59.8	65.7	60.6	62.9	104
Hill Farm Coastcross-1	64.8	67.2	61.9	61.7	66.4	61.1	63.9	106
S-54	62.6	63.0	59.3	60.2	61.7	59.2	61.0	101
Mean	62.7	64.6	60.2	59.9	62.8	58.7		