

**Forage Research
In Texas,
1985**

Introduction

Coastal bermudagrass has been used extensively throughout the South and Southeastern United States for a pasture and hay crop for more than 35 years. Plant breeders have shown that substantial improvements in nutritive value were possible with certain hybrid bermudagrasses. Thus, there are plant breeding materials available which are potential replacements for Coastal bermudagrass. This trial was initiated to evaluate some of the hybrid bermudagrasses for dry matter, stand maintenance and vigor, and to compare these selections with Coastal and Tifton 44 bermudagrass.

Procedure

Fourteen bermudagrass hybrids from Dr. Glenn Burton's breeding program (USDA, Tifton, Georgia), along with Coastal and Tifton 44 bermudagrasses, were planted in 8 x 20 feet plots. An 8-foot fallow border was left between all plots to prevent soil contamination from the vigorous, stoloniferous types. Plots were established in 1981 and were not harvested until the 1982 growing season. Two, 1-square foot, quadrants were hand-clipped from each plot when grass reached approximately 8 to 12 inches in height. During 1982, plots were harvested to a 2-inch stubble height; whereas, in 1983 and 1984, plots were harvested to ground level (0-inch stubble height). After collecting yield data from the plots, cows and calves were allowed to graze the entire area. A large number of animals were used so that the plots were grazed to an approximate 1-inch height as rapidly as possible (2-day period). Animals were removed from the plots and the grass was allowed to grow until the next harvest period. Fertilizer was applied during the growing season for annual rates of 580-100-100, 340-100-100, and 245-100-100 lb/A N-P₂O₅-K₂O, respectively for 1982, 1983, and 1984. A high nitrogen rate was used during 1982 to discourage spot grazing due to defecation areas. During the second year and third years, however, spot grazing was not a problem in the plots.

Results and Discussion

Monthly rainfall during the bermudagrass growing seasons of 1982-84 and their deviation from a 17-year average are shown in Table 1. Drought-like conditions

Forage Production Potential of Sixteen Bermudagrass Selections

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Summary

Sixteen bermudagrass hybrids were compared for seasonal and total dry matter production during each year of a 3-year period. Yields were hand-clipped from small areas within each plot and complete plot defoliation was achieved using cows and calves. Thus, all hybrids were exposed to the physical effects of grazing and treading. Because of dry conditions during July through September 1982 and 1984, bermudagrass yields were similar for those 2 years. Slightly higher mid-summer rainfall in 1983 allowed total yields in excess of 12 tons dry matter. The 3-year average yields indicated that Coastal bermudagrass continued to produce as much forage as any of the new plant breeding lines tested. And, because of a mid-summer reduction in dry matter production which was linked directly to a lack of drought resistance, Tifton 44 bermudagrass was one of the lowest forage producing hybrids evaluated.

KEYWORDS: Bermudagrass/dry matter production/Coastal/Tifton 44.

TABLE 1. MONTHLY RAINFALL DURING A 3-YEAR EVALUATION OF BERMUDAGRASS SELECTIONS

Month	1982	1983	1984	17-year Average
April	3.87	0.24	1.58	3.87
May	5.48	7.22	2.74	4.40
June	4.89	8.45	1.75	4.27
July	1.40	1.57	1.75	2.89
August	0.43	2.17	0.84	1.74
September	0.74	1.18	1.35	4.02
October	6.58	2.82	9.34	4.16

TABLE 2. DRY MATTER PRODUCTION OF BERMUDAGRASS SELECTIONS DURING 1982¹

SELECTION	5-5	5-27	6-15	6-30	7-20	8-10	9-7	10-17	TOTAL ²
	Pounds/Acre								
T-14	2,400	1,034	2,479	1,565	3,645	2,602	1,236	1,841	16,802 A
T-7	3,096	1,078	2,290	1,476	3,183	2,400	1,205	1,985	16,711 A
T-13	3,024	1,139	2,465	1,407	3,358	2,280	1,493	1,445	16,609 A
T-9	2,304	893	2,434	1,462	3,468	2,607	850	2,292	16,308 AB
Coastal	1,872	1,059	2,815	1,383	2,848	2,590	1,277	1,406	15,250 ABC
T-12	2,376	1,193	2,470	1,260	3,144	2,184	895	1,433	14,955 ABC
T-4	2,544	806	2,237	1,178	2,525	2,530	1,013	1,846	14,679 ABC
T-3	2,592	884	1,570	1,301	2,508	1,704	979	1,428	12,965 BCD
T-5	2,232	991	2,026	1,198	2,424	1,860	550	1,538	12,818 CD
T-11	1,296	907	2,309	1,318	2,537	2,105	979	1,262	12,713 CD
T-10	1,968	855	1,728	1,325	2,753	1,399	1,387	1,003	12,417 CD
T-6	2,184	934	2,134	1,030	1,908	1,810	523	1,886	12,408 CD
T-1	1,536	922	1,894	1,128	2,237	1,618	1,092	1,447	11,873 CDE
T-2	2,088	754	1,253	996	1,913	1,493	668	1,270	10,433 DE
Tifton 44	1,752	914	1,279	1,047	2,100	1,467	756	633	9,948 DE
T-8	1,320	780	1,212	1,024	1,862	1,627	744	399	8,967 E

¹Plots harvested to a 2-inch stubble height and fertilized with 580-100-100 lb/A N-P₂O₅-K₂O.

²Means in the same column followed by different letters differ (P < 0.05) according to LSD.

existed during the mid-summer periods of 1982 and 1984; whereas, the same 3-month period of 1983 more closely approximated the longer term average. Seasonal as well as total dry matter production from the 16 bermudagrass selections are shown in Tables 2, 3, and 4 for each of the 3-year periods. Table 5 shows the 3-year average dry matter productions and the relative rank of each hybrid. T-14, T-13, Coastal, and T-4 bermudagrasses were the top yielding hybrids; whereas, T-1, T-8, T-2, and Tifton 44 were the least productive bermudagrasses tested over this 3-year period. Tifton 44 has exhibited acceptable forage production in early spring; however, by mid-summer, its lack of drought tolerance has severely restricted forage production. Based on this trial, Tifton 44 would not be an acceptable replacement for Coastal bermudagrass on the upland, sandy, drought-

TABLE 3. DRY MATTER PRODUCTION OF BERMUDAGRASS SELECTIONS DURING 1983¹

Selection	5-25	6-8	7-5	8-3	9-6	11-8	Total ²
	Pounds/Acre						
T-14	4,006	2,271	4,510	5,036	5,098	4,433	25,354 A
Coastal	3,670	2,129	5,110	4,858	5,040	3,888	24,695 A
T-13	3,655	2,304	4,164	5,256	5,239	3,855	24,473 A
T-12	3,694	1,932	4,555	5,117	4,630	3,706	23,634 AB
T-7	3,384	2,009	4,431	4,714	4,253	4,297	23,088 ABC
T-11	3,744	1,678	4,670	4,795	4,723	3,358	22,968 ABC
T-9	2,361	1,747	4,507	4,819	4,263	4,750	22,447 A-D
T-6	2,774	1,618	3,929	4,512	4,997	3,703	21,533 A-E
T-10	3,089	1,836	3,941	4,210	3,792	2,789	19,657 B-F
Tifton-44	3,228	1,788	4,078	4,051	3,480	2,537	19,162 C-G
T-4	2,086	1,531	3,696	3,938	4,198	3,084	18,533 D-G
T-5	1,742	1,488	4,032	4,279	3,936	3,043	18,520 D-G
T-3	2,033	1,339	3,271	3,574	4,253	3,562	18,032 EFG
T-2	2,691	1,218	3,763	3,543	3,226	3,168	17,607 EFG
T-8	2,585	1,462	3,883	3,701	3,552	2,242	17,425 FG
T-1	1,078	617	2,911	3,492	3,240	3,771	15,109 G

¹Plots harvested to ground level (0-inch stubble height) and fertilized with 340-100-100 lb/A N-P₂O₅-K₂O.

²Means in the same column followed by different letters differ (P < 0.05) according to LSD.

TABLE 4. THIRD-YEAR DRY MATTER PRODUCTION OF BERMUDAGRASS SELECTIONS¹

Selection	5-23	7-20	8-27	11-12	Total
	Pounds/Acre				
Coastal	4,092	6,205	2,971	3,706	16,974 A
T-11	3,403	6,598	3,257	3,660	16,918 A
T-6	3,473	6,744	2,374	3,485	16,076 AB
T-13	3,302	5,775	3,129	3,783	15,989 AB
T-7	4,217	5,854	2,261	3,300	15,632 ABC
T-5	3,715	4,968	2,467	4,044	15,194 ABC
T-3	2,933	5,918	2,251	3,989	15,091 ABC
T-14	3,103	5,600	2,686	3,538	14,927 ABC
T-4	2,976	5,782	2,424	3,627	14,809 ABC
T-8	3,211	5,019	2,309	3,888	14,427 ABC
T-12	2,683	5,143	2,662	3,468	13,956 ABC
T-2	3,595	4,380	2,223	3,561	13,759 ABC
T-9	1,327	5,117	2,849	3,984	13,277 BC
Tifton-44	3,924	4,798	1,795	2,693	13,210 BC
T-10	3,631	4,517	1,762	2,609	12,519 CD
T-1	1,601	4,167	1,618	2,520	9,906 D

¹Plots harvested to ground level (0-inch stubble height) and fertilized with 265-100-100 lb/A N-P₂O₅-K₂O.

²Means in the same column followed by different letters differ (P < 0.05) according to LSD.

TABLE 5. THREE-YEAR AVERAGE OF BERMUDAGRASS YIELDS

Selection	Year 1	Year 2	Year 3	Average
	Pounds/Acre			
T-14	16,802	25,354	14,927	19,028
T-13	16,609	24,473	15,989	19,024
Coastal	15,250	24,695	16,974	18,973
T-7	16,711	23,088	15,632	18,477
T-11	12,713	22,968	16,918	17,533
T-12	14,955	23,634	13,956	17,515
T-9	16,308	22,447	13,277	17,344
T-6	12,408	21,533	16,076	16,672
T-4	14,679	18,533	14,809	16,007
T-5	12,818	18,520	15,194	15,511
T-3	12,965	18,032	15,091	15,363
T-10	12,417	19,657	12,519	14,864
Tifton-44	9,948	19,162	13,210	14,107
T-2	10,433	17,607	13,759	13,933
T-8	8,967	17,425	14,427	13,606
T-1	11,873	15,109	9,906	12,296

susceptible soils of the lower South. From the selections evaluated in this trial, Coastal remains as one of the most reliable hybrid bermudagrasses available for improved pasture and hay.

The use of cows and calves as "mob grazers" was an effective and efficient method of evaluating new cultivars for resistances to grazing pressures. However, since the defoliation scheme was established to harvest forage after some accumulation time, this technique as employed simulated rotational rather than continuous grazing. A modification of this technique may be necessary to simulate continuous grazing.