



Forage Research in Texas

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YIELD EVALUATION OF BERMUDAGRASS SELECTIONS

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SUMMARY

Sixteen bermudagrass hybrids were evaluated for seasonal and total dry matter production. Yields were taken by hand-clipping small areas within each plot. Complete plot defoliation was accomplished using cows and calves as mob grazers which allowed the plants to respond to grazing pressure rather than mowing pressure. Two-year average yields ranged from approximately 10 tons per acre dry matter for selections T-14, T-7, T-13, and Coastal bermudagrass to approximately 7 tons per acre dry matter for Tifton 44, T-2, T-8, and T-1. The lower yielding selections were either late in making an abundance of growth, were adversely affected by the drought-like conditions of late summer-early fall, or a combination of these factors. From this two-year trial, Tifton 44 does not appear to be a suitable replacement for Coastal bermudagrass when using total yield as the primary selection criterion.

INTRODUCTION

Previous research has shown that significant improvements in nutritive value may be made with hybrid bermudagrasses. However, since Coastal bermudagrass has been the most extensively used hybrid bermudagrass used in the Southeastern U.S., any bermudagrasses to be released as a new variety should be equal to or better than Coastal as a pasture or hay crop. This trial was initiated to evaluate bermudagrass hybrids for dry matter production, vigor, and stand maintenance, and to use both Coastal and Tifton 44 bermudagrasses as standards.

PROCEDURE

Fourteen bermudagrass hybrids from Dr. Glenn Burton's breeding program (USDA, Tifton, Ga.), along with Coastal and Tifton 44 bermudagrasses, were planted in 8'x20' plots. An 8' fallow border was left between all plots to prevent plot contamination from the vigorous, stoloniferous types. Plots were established in 1981 and were not harvested until the 1982 and 1983 growing season. Two, one square foot, quadrates were hand-clipped from each plot when grass reached approximately 8 to 12 inches in height. During 1982, plots were harvested to a 2" stubble height; whereas, in 1983, plots were harvested to ground level (0" stubble height). After collecting yield data from the plots, cows and calves were allowed to graze the entire

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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 allowed to grow until the next harvest period. Fertilizer was applied six times during the growing season for annual rates of 580-100-100 and 340-100-100 lbs/ac $N-P_2O_5-K_2O$, respectively for 1982 and 1983. A high nitrogen rate was used during 1982 to discourage spot grazing due to defecation areas. During the second year, however, spot grazing was not a problem in the plots.

RESULTS AND DISCUSSION

Seasonal and total dry matter production for the 16 bermudagrasses are shown in Tables 1 and 2. Although there were some rank changes between the two years, those selections which produced top yields during the first year repeated this trait during the second year. Similarly, those selections which were low yielders the first year were also in the same category at the end of the second year. Table 3 shows the two-year average dry matter produced from these plots. The two-year average ranged from approximately 10 tons dry matter per acre (11.5 tons hay) for selections T-14, T-7, Coastal, and T-13. Those selections which were in the bottom 25% of the group and produced a two-year average dry matter yield of $6\frac{1}{2}$ to 7 tons were Tifton 44, T-2, T-8, and T-1.

Tifton 44 ranked at the bottom of the group primarily due to a lack of production in September and October. During these two years, these months were below normal in rainfall. Thus, it may be concluded that although Tifton 44, released originally as a replacement for Midland bermudagrass, may be more winter hardy than Coastal, it does not withstand drought-like conditions which occur in late summer and early fall. Visual observations have substantiated that Tifton 44 is not as drought-tolerant as Coastal bermudagrass on sandy, upland soil types. From the data collected in this two-year trial it may be further concluded that on a total yield basis, Tifton 44 may not be a good replacement for Coastal bermudagrass in the lower Southeastern U.S.

The use of "mob grazers" served as a useful method of evaluating grasses under the influence of grazing pressure, and also as a means of cleaning off plots after yield samples had been taken. However, this technique as employed in these two years of data collection has probably simulated a semi-haying condition or rotational grazing pattern rather than continuous grazing. This, plus the fact that additional data such as quality, vigor, and stand maintenance have not been included may alter the final rankings and conclusions concerning those bermudagrasses worthy of achieving varietal status.

TABLE 1. FIRST YEAR DRY MATTER PRODUCTION OF BERMUDAGRASS SELECTIONS¹

SELECTION	5-5	5-27	6-15	6-30	7-20	8-10	9-7	10-17	TOTAL
	----- (lbs/ac) -----								
T-7	3136	1133	2458	1328	3024	2474	1261	2230	17044 a ²
T-9	2240	858	2220	1491	3443	2525	912	2336	16025 b
Coastal	1792	1050	2842	1488	2848	2723	1232	1453	15428 c
T-13	2688	1120	2339	1315	2989	2202	1469	1216	15338 c
T-14	2272	1078	2166	1574	3024	2285	1114	1664	15177 c
T-12	2464	1174	2506	1341	2610	2093	918	1322	14428 d
T-4	2496	784	2291	1174	2295	2531	1021	1738	14330 d
T-11	1568	1008	2480	1370	2797	2202	810	1443	13688 e
T-3	2656	970	1603	1238	2650	1792	1187	1562	13658 ef
T-5	2304	1072	2115	1309	2470	2051	557	1491	13369 f
T-10	1824	807	1866	1305	2243	1402	1510	1033	11990 g
T-6	2080	893	1994	1062	1837	1610	643	1728	11847 g
Tifton 44	2240	1117	1498	1184	2406	1731	874	755	11805 g
T-1	1194	960	1696	1123	1767	1546	1264	1536	11086 h
T-8	1600	1001	1552	1078	2029	1693	813	362	10128 h
T-2	2048	765	1110	935	1715	1450	727	1274	10024 h

¹Plots harvested to a 2" stubble height and fertilized with 580-100-100 lbs/ac N-P₂O₅-K₂O.

²Means in the same column with different superscripts differ (P<.05) according to Duncan's Multiple Range Test.

TABLE 2. SECOND YEAR DRY MATTER PRODUCTION OF BERMUDAGRASS SELECTIONS¹

SELECTION	5-25	6-8	7-5	8-3	9-6	11-8	TOTAL ²
----- (lbs/ac) -----							
T-14	4006	2271	4510	5036	5098	4433	25354
Coastal	3670	2129	5110	4858	5040	3888	24695
T-13	3655	2304	4164	5256	5239	3855	24473
T-12	3694	1932	4555	5117	4630	3706	23634
T-7	3384	2009	4431	4714	4253	4297	23088
T-11	3744	1678	4670	4795	4723	3358	22968
T-9	2361	1747	4507	4819	4263	4750	22447
T-6	2774	1618	3929	4512	4997	3703	21533
T-10	3089	1836	3941	4210	3792	2789	19657
T-4	2086	1531	3696	3938	4198	3084	18533
T-5	1742	1488	4032	4279	3936	3043	18520
T-3	2033	1339	3271	3574	4253	3562	18032
T-2	2691	1218	3763	3543	3226	3168	17607
T-8	2585	1462	3883	3701	3552	2242	17425
Tif 44	3228	1788	4078	4051	3480	2537	16625
T-1	809	617	2911	3492	3240	3771	14840

¹ Plots harvested to ground level (0" stubble height) and fertilized with 340-100-100 lbs/ac N-P₂O₅-K₂O.

² Means in the same column with different superscripts differ (P<.05) according to Duncan's Multiple Range Test.

TABLE 3. TWO-YEAR AVERAGE OF BERMUDAGRASS YIELDS

SELECTION	Year 1	Year 2	AVERAGE
T-14	15177	25354	20266
T-7	17044	23088	20066
Coastal	15428	24695	20062
T-13	15338	24473	19906
T-9	16025	22447	19236
T-12	14428	23634	19031
T-11	13688	22968	18328
T-6	11847	21533	16690
T-4	14330	18533	16432
T-5	13369	18520	15945
T-3	13658	18032	15845
T-10	11990	19657	15824
Tif-44	11805	16625	14215
T-2	10024	17607	13816
T-8	10128	17425	13777
T-1	11086	14840	12963