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FORAGE PRODUCTION FROM 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 three-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 trodding. Because of dry conditions during July-September in 1982 and 1984, bermudagrass yields were similar for those two 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 growth reduction linked directly to a lack of drought-resistance, Tifton 44 bermudagrass was one of the lowest forage producing hybrids evaluated.

OBJECTIVES

This trial was initiated to evaluate some hybrid bermudagrasses for dry matter production, stand maintenance, and vigor, and to compare these selections with Coastal and Tifton 44 bermudagrasses.

PROCEDURE

Fourteen experimental 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 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 and 1984, 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 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 during the growing season for annual rates of 580-100-100, 340-100-100 and 245-100-100 lbs/ac 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

Monthly rainfall during the bermudagrass growing seasons of 1982-1984 and their deviation from a 17-year average are shown in Table 1. Drought-like conditions 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 2-4 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-susceptible soils of the lower South. And, 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.

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

Month	1982	1983	1984	17-yr. Avg.
	-----inches-----			
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	.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	8010	9-7	10-17	TOTAL ²
	----- (lbs/ac) -----								
T-14	2400	1034	2479	1565	3645	2602	1236	1841	16802 A
T-7	3096	1078	2290	1476	3183	2400	1205	1985	16711 A
T-13	3024	1139	2465	1407	3358	2280	1493	1445	16609 A
T-9	2304	893	2434	1462	3468	2607	850	2292	16308 AB
Coastal	1872	1059	2815	1383	2848	2590	1277	1406	15250 ABC
T-12	2376	1193	2470	1260	3144	2184	895	1433	14955 ABC
T-4	2544	806	2237	1178	2525	2530	1013	1846	14679 ABC
T-3	2592	884	1570	1301	2508	1704	979	1428	12965 BCD
T-5	2232	991	2026	1198	2424	1860	550	1538	12818 CD
T-11	1296	907	2309	1318	2537	2105	979	1262	12713 CD
T-10	1968	855	1728	1325	2753	1399	1387	1003	12417 CD
T-6	2184	934	2134	1030	1908	1810	523	1886	12408 CD
T-1	1536	922	1894	1128	2237	1618	1092	1447	11873 CDE
T-2	2088	754	1253	996	1913	1493	668	1270	10433 DE
Tifton 44	1752	914	1279	1047	2100	1467	756	633	9948 DE
T-8	1320	780	1212	1024	1862	1627	744	399	8967 E

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

² Means in the same column with different superscripts differ (P<.05) according to LSD.

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
	----- (lbs/ac) -----						
T-14	4006	2271	4510	5036	5098	4433	25354 A
Coastal	3670	2129	5110	4858	5040	3888	24695 A
T-13	3655	2304	4164	5256	5239	3855	24473 A
T-12	3694	1932	4555	5117	4630	3706	23634 AB
T-7	3384	2009	4431	4714	4253	4297	23088 ABC
T-11	3744	1678	4670	4795	4723	3358	22968 ABC
T-9	2361	1747	4507	4819	4263	4750	22447 A-D
T-6	2774	1618	3929	4512	4997	3703	21533 A-E
T-10	3089	1836	3941	4210	3792	2789	19657 B-F
Tifton-44	3228	1788	4078	4051	3480	2537	19162 C-G
T-4	2086	1531	3696	3938	4198	3084	18533 D-G
T-5	1742	1488	4032	4279	3936	3043	18520 D-G
T-3	2033	1339	3271	3574	4253	3562	18032 EFG
T-2	2691	1218	3763	3543	3226	3168	17607 EFG
T-8	2585	1462	3883	3701	3552	2242	17425 FG
T-1	1078	617	2911	3492	3240	3771	15109 G

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

²Means in the same column with different superscripts differ (P<.05) according to LSD.

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

SELECTION	5-23	7-20	8-27	11-12	TOTAL ²
----- (lbs/ac) -----					
Coastal	4092	6205	2971	3706	16974 A
T-11	3403	6598	3257	3660	16918 A
T-6	3473	6744	2374	3485	16076 AB
T-13	3302	5775	3129	3783	15989 AB
T-7	4217	5854	2261	3300	15632 ABC
T-5	3715	4968	2467	4044	15194 ABC
T-3	2933	5918	2251	3989	15091 ABC
T-14	3103	5600	2686	3538	14927 ABC
T-4	2976	5782	2424	3627	14809 ABC
T-8	3211	5019	2309	3888	14427 ABC
T-12	2683	5143	2662	3468	13956 ABC
T-2	3595	4380	2223	3561	13759 ABC
T-9	1327	5117	2849	3984	13277 BC
Tifton-44	3924	4798	1795	2693	13210 BC
T-10	3631	4517	1762	2609	12519 CD
T-1	1601	4167	1618	2520	9906 D

¹ Plots harvested to ground level (0" stubble height) and fertilized with 265-100-100 lbs/ac N-P₂O₅-K₂O.

² Means in the same column with different superscripts differ (P<.05) according to LSD.

TABLE 5. THREE-YEAR AVERAGE OF BERMUDAGRASS YIELDS

SELECTION	Year 1	Year 2	Year 3	AVERAGE
----- (lbs/ac) -----				
T-14	16802	25354	14927	19028
T-13	16609	24473	15989	19024
Coastal	15250	24695	16974	18973
T-7	16711	23088	15632	18477
T-11	12713	22968	16918	17533
T-12	14955	23634	13956	17515
T-9	16308	22447	13277	17344
T-6	12408	21533	16076	16672
T-4	14679	18533	14809	16007
T-5	12818	18520	15194	15511
T-3	12965	18032	15091	15363
T-10	12417	19657	12519	14864
Tifton-44	9948	19162	13210	14107
T-2	10433	17607	13759	13933
T-8	8967	17425	14427	13606
T-1	11873	15109	9906	12296