

TIFTON 85 BERMUDAGRASS RESPONSE TO LIMESTONE RATE, ECCE, AND BORON

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Background. The tolerance of 'Coastal' bermudagrass to soil acidity is reported in numerous papers. Little is known about the tolerance of Tifton 85 bermudagrass since it is a relatively recent hybrid bermudagrass release. The fact that most types of bermudagrass are tolerant to acid soils leads one to suspect that Tifton 85 bermudagrass would be similarly tolerant to soil acidity. Research was needed to determine the acid tolerance of Tifton 85 bermudagrass.

A research site that was initially established in 1988 on 9 x 15 foot plots specifically for use to evaluate forage response to limestone rate, limestone effective calcium carbonate equivalence (ECCE), and to boron rates was selected for this study. Specific plots in this study were treated in 1988, 1991, and 1992 with the per-acre equivalents of 0, 1, and 2 tons of ECCE 62% and ECCE 100% limestones mined from the same quarry. Each year, boron rates at 0, 1, and 2 lb/acre were applied to designated plots according to the treatment design, except for two years when rates were increased to 2 and 4 lb of B/ac for alfalfa. From 1988 through 2003 the whole plot was fertilized with the various plant nutrients required for the specific crops evaluated on the site. These crops included clovers and alfalfa that received no fertilizer nitrogen but were fertilized, as were all forages, with adequate rates of phosphorus, potassium, magnesium, and sulfur for optimum forage production. Ryegrass and Coastal bermudagrass evaluated on these plots received uniform rates of nitrogen. Nitrogen application lowered pH in all plots. Tifton 85 bermudagrass was sprigged April 24, 2001 in a 3 x 3 ft grid pattern. The bermudagrass was allowed to cover the plots during the summer. We reapplied limestone with ECCE of 62 and 100% at 0, 1, and 2 tons/acre to the specific plots in Oct. 2001 according to the treatment design. One harvest was made on Sept. 11, 2001, three in 2002, and four harvests were made in 2003.

Research Findings. Total annual yields in 2002 (Table 1) and in 2003 (Table 2) indicate that there were no statistically significant differences due to limestone rate or ECCE. There was no yield response to boron either year. For reasons not known at this time, dry matter yields in the first and third harvests of 2003 were more than 400 lb/ac higher in the unlimed treatments compared to yields in the high limestone rate plots (Table 2).

Application. Yield data from harvests made in 2001 and from 2002, except for Sept. 18, are considered preliminary because Tifton 85 was not a fully established stand. This is verified by the high coefficient of variation (CV) indicated in Table 1. During the 2002 growing season, the bermudagrass became more uniformly established over all plots as indicated by the declining

CVs in later harvests. Yield data collected in 2003 have lower variation, indicating that the stands were uniform (Table 2). Preliminary data indicate Tifton 85 bermudagrass is relatively tolerant to soil acidity in this Darco loamy fine sand. Evaluation of Tifton 85 bermudagrass response to these treatments will continue.

Table 1. Tifton 85 bermudagrass dry matter yield response to limestone and boron rates and ECCE.

Limestone rate tons/acre	-----Year and harvest date-----				Total Yield 2002
	9/11/2001	5/23/2002	7/9/2002	9/18/2002	
	-----Dry matter, lb/ac-----				
0	2,483 ns	860 b [†]	5,845 ns	4,280 a	10,984 ns
1	2,708 ns	1,127 a	6,160 ns	3,898 ab	11,184 ns
2	2,854 ns	828 b	5,870 ns	3,761 b	10,458 ns
ECCE %					
62	2,670 ns	926 ns	6,402 ns	3,769 ns	11,096 ns
100	2,891 ns	1,029 ns	5,628 ns	3,890 ns	10,546 ns
Boron, lb/ac					
0	2,828 ns	1,041 ns	6,038 ns	3,989 ns	11,068 ns
1	2,540 ns	931 ns	5,646 ns	3,999 ns	10,575 ns
2	2,796 ns	890 ns	6,258 ns	3,771 ns	10,919 ns
R ²	0.45	0.41	0.43	0.51	0.31
C.V.	20.4	37.2	28.3	15.0	18.7

[†] Yield followed by a different letter within a column indicates statistical significance at $p=0.05$.

Table 2. Tifton 85 bermudagrass dry matter yield response to limestone and boron rates and ECCE.

Limestone rate tons/acre	-----Harvest date, 2003-----				Total Yield 2003
	5/23	6/25	8/5	9/16	
	-----Dry matter, lb/ac-----				
0	4,012 a [†]	3,933 b	4,441 a	2,357 ns	14,743 ns
1	3,836 ab	4,083 a	4,220 ab	2,505 ns	14,643 ns
2	3,592 b	3,927 b	4,065 b	2,449 ns	14,033 ns
ECCE %					
62	3,679 ns	4,047 ns	4,158 ns	2,481 ns	14,365 ns
100	3,749 ns	3,963 ns	4,127 ns	2,473 ns	14,311 ns
Boron, lb/ac					
0	3,898 ns	4,010 ns	4,071 ns	2,382 ns	14,359 ns
1	3,720 ns	4,041 ns	4,298 ns	2,477 ns	14,536 ns
2	3,703 ns	3,922 ns	4,238 ns	2,500 ns	14,362 ns
R ²	0.35	0.50	0.43	0.39	0.37
C.V.	10.1	4.6	9.5	14.5	6.4

[†] Yield followed by a different letter within a column indicates statistical significance at $p=0.05$.