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Location: Beeville

NITROGEN NUTRITION OF S-16 BERMUDAGRASS GROWN ON SOUTH TEXAS SOILS

OBJECTIVE:

To establish the nitrogen requirements of S-16 bermudagrass as measured by forage yield response and protein levels in the forage.

PROCEDURE:

The nitrogen rate experiment was initiated on an established stand of S-16 bermudagrass located on Clareville clay loam soil at the TAES, Beeville. Ammonium nitrate was applied at rates of 0,100,200,300,400, and 500 lb N/A at graded levels of phosphorus. Plot dimensions were 8' x 18' with harvest area taken from a swath 3' x 18' from the middle of the plot. All treatments were arranged in a randomized block design with 4 replications.

Chemical analyses for nitrogen concentration were made using the standard Micro Kjeldahl method and protein was computed by use of the factor 6.25.

RESULTS AND DISCUSSION:

Forage production from S-16 bermudagrass reached the highest yields in the first year of the 3-year study. This was largely attributed to higher rainfall during the initial phase of the study and invasion of rust disease during the latter stages of the study. Data for first year is plotted in Figure 1 and shows the nitrogen response followed a quadratic function. The computed economic optimum rate of nitrogen fertilization for this grass under the conditions that prevailed in 1977 was 390 lb N/A.

Although not shown similar computations for the 1978 data would indicate somewhat lower economic optimum rates. These data (Table 1) indicate that plant response occurred to nitrogen rates of between 300-400 lb N/A when phosphorus was constant at 60 lb P_2O_5/A. The highest rate of nitrogen (500 lb N/A) appeared to give some yield increase over the 300 lb rate when phosphorus rates were jumped to 120 lb P_2O_5/A. However, it is doubtful that the extra phosphorus would be economically feasible.

Partial data for nitrogen fertilizer recoveries indicate efficiency percentages ranged from 32.5 to a high of 59.3 when nitrogen rates increased from 100 to 300 lb N/A.

Protein data as affected by Nitrogen fertilizer rates are presented in Table 2. The data suggests that nitrogen fertilization changes the protein level in S-16 bermudagrass relatively little unless extremely high levels of nitrogen are used when 6-7 week intervals are allowed between harvests. Even with 300 lb N/A in 3 of the 4 cuttings the forage had protein levels under 10 percent. The exception involved July 15 clipping which had protein approaching 16 percent after a 3 week growth period.

Table 1. Effect of nitrogen rate on forage production and efficiency of nitrogen utilization by S-16 bermudagrass. Clareville clay loam, Beeville. 1978.

N Rate (lb/A)		Dry Matter (lb/A)	N Efficiency (%)
0		931	-
100	60 P_2O_5	3,733	32.5
200		7,299	51.5
300		10,224	59.3
400		12,604	-
500		9,666	42.8
100	120 P_2O_5	5,128	-
200		8,986	-
300		12,711	-
400		12,607	-
500		14,338	-

Table 2. Effect of nitrogen rate and harvest time on protein content of S-16 bermudagrass forage. Clareville clay loam.

Treatment (lb/A)			Clipping				
N	P_2O_5	K_2O	1	2	3	4	Avg.
			% Protein				
0	0	0	5.37	6.81	5.90	5.71	5.93
0	60	0	5.60	6.78	5.62	4.98	5.75
100	60	0	6.76	7.26	5.58	5.05	6.16
200	60	0	8.63	12.7	6.67	5.20	8.3
300	60	0	9.70	15.7	8.17	6.17	9.94
500	60	0	13.0	17.4	14.20	10.1	13.7

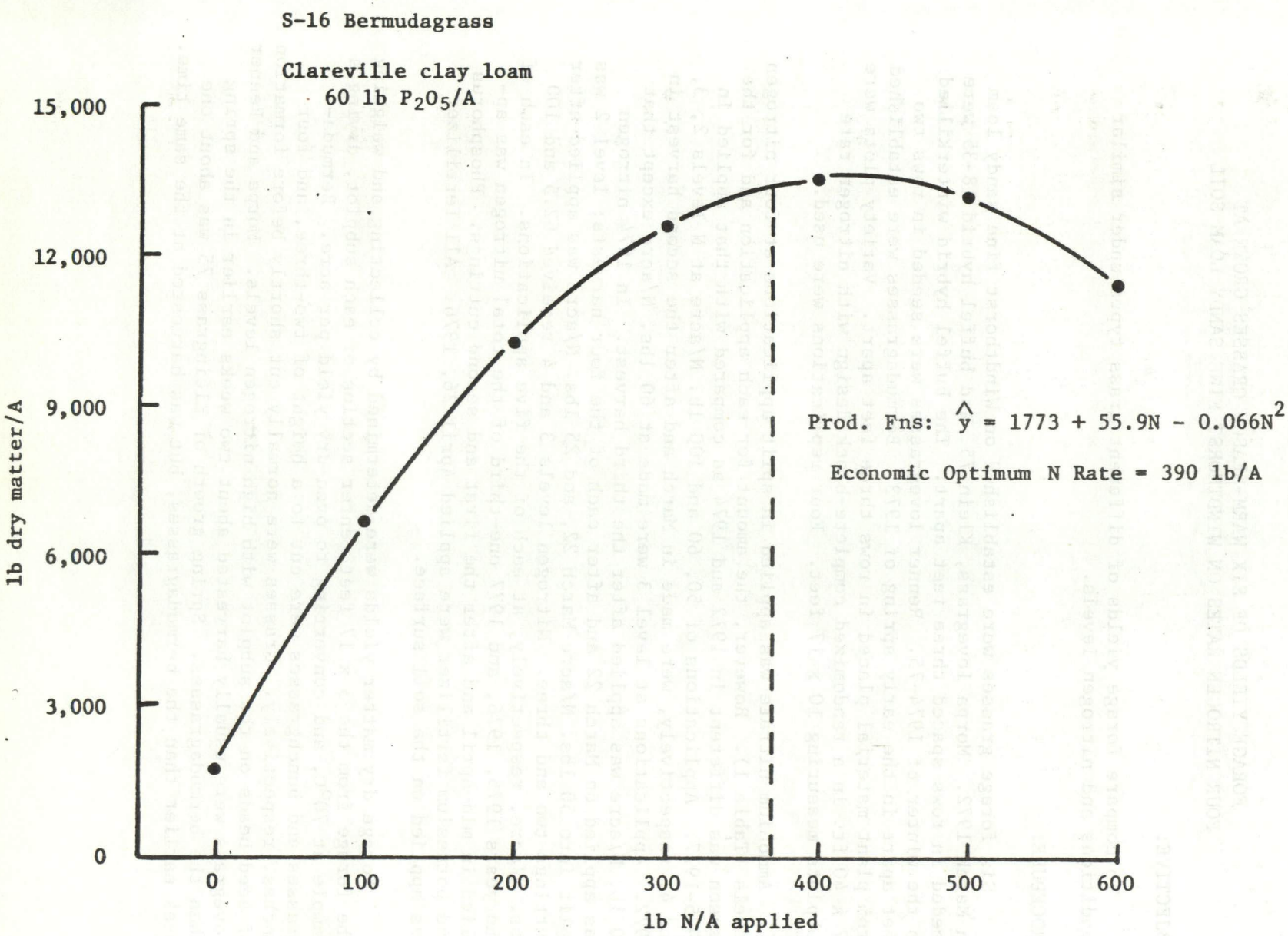

Figure 2. Effect of nitrogen rates on forage yields in S-16 bermudagrass. Clareville clay loam, Beeville.