Forage Research in Texas

Departmental Technical Report No. 81-12

Department of Soil and Crop Sciences

FG - 0060

Worker: Ronald M. Jones

Location: Stephenville

EFFECTS OF PHOSPHORUS AND POTASSIUM ON COASTAL BERMUDAGRASS PRODUCTION

OJBECTIVE:

To determine the effect of phosphorus and potassium on yield of Coastal bermudagrass on Windthorst fine sandy loam soil.

PROCEDURE:

A 3 x 3 factorial design was used on established Coastal bermudagrass at phosphorus and potassium rates listed in Table 1. Eight replications of plots 8 x 16 feet were used. A soil analysis has not been completed. However, Windthorst fsl soil is usually very low in phosphorus and high in potassium. A swath 34 inches x 16 feet was cut from the center of each plot. Samples were weighed and subsamples dried at 70°C to determine dry matter yields. Two harvests were made in 1978 and 1979 while only one harvest was made in 1980.

Ammonium nitrate was broadcast at the rate of 298 pounds/acre along with phosphorus and potassium in late April of 1978, 1979, and 1980. An additional 298 pounds/acre of ammonium nitrate was applied shortly after the first harvest each year.

Concentrated superphosphate and muriate of potash were the sources used to supply phosphorus and potassium, respectively.

RESULTS AND DISCUSSION:

Results from this test are presented in Table 1. Despite late application of phosphorus each year (late April), there was a significant yield response each year to 50 pounds P_2O_5 per acre. Production over the three-year period was increased by 1.69 tons/acre due to application of 150 pounds P_2O_5/acre. Yield from yearly applications of 150 lb P_2O_5/acre was not significantly greater than yield from annual application of 50 lb P_2O_5/acre.

Response to potassium is shown in Table 1. When all three rates of P_2O_5 are averaged for 1978, yield was increased by 0.44 ton/acre where 50 lb K_2O/acre was applied. No response was obtained in the following two years nor for rates higher than 50 lb K_2O/acre in any year.

Table 1. Tons per acre of Ccastal bermudagrass produced on Windthorst fsl at three levels of phosphorus and potassium during three years 1/

Pounds P_2O_5/Acre	1978				1979				1980			
	Pounds K_2O Per Acre											
	0	50	150	Mean*	0	50	150	Mean	0	50	150	Mean
0	3.2	4.2	3.4	3.6b	4.7	5.3	4.9	5.0b	2.1	2.3	2.2	2.2b
50	4.0	4.2	4.1	4.1a	5.6	5.9	5.7	5.7a	2.8	2.7	2.7	2.7a
150	4.1	4.3	4.4	4.3a	5.6	5.9	6.0	5.8a	2.6	2.7	2.7	2.7a
Mean	3.8a	4.2b	3.9ab		5.3a	5.6a	5.7a		2.5a	2.6a	2.5a	

1/ Rainfall for 1978 and 1980 was approximately 6 inches below average for the April-October growing season while 1979 rainfall was about 1 inch above average.

*Means within a column or within a row not followed by the same letter are significantly different at the 0.05 level, Duncan's NMR test.