

# Forage Research in Texas

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## Soil Fertility Management for Selected Forages

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## SUMMARY

The forage yields of Klein, Limpo, Callie-Bermuda, Tifton-44 and SS-16 grasses were significantly increased by N fertilization applied at 262 kg/ha but not by P. Protein contents of the various forages were inversely proportional to DMY yields and did not increase appreciably by increase in N or P.

## Procedure

Plots of each cultivar were established 1980 on the Hockley fine sandy loam of the Prairie View A&M University Cooperative Research Center. For this study there were 3 plots of each grass in each of 4 blocks (replications) representing 3 soil N levels of 22, 262, and 502 kg/ha N as  $\text{NH}_4\text{NO}_3$ , the first level being native N and the others being split applications of 60 and 120 kg/ha each in spring and following each harvest. Each block was split in 3 to accommodate soil P levels of 7, 207, and 407 kg/ha P as Superphosphate, the first level being native P and the others being split applications of 50 and 100 kg/ha each in the spring and following each harvest. In the spring all the plots were treated with K at 120 kg/ha and limed to pH 6.2. Cuttings were taken in May, June, July and September and dry matter yields (DMY) and crude protein determined.

## Results

Analysis of variance (Table 1) of the seasonal (total) DMY of the forages as a function of soil N and/or P indicated that seasonal DMY were significantly influenced by replication, soil N and variety interaction. Seasonal DMY were not significantly influenced by soil P nor any of its interactions.

The mean seasonal DMY of the forages as a function of soil N level is given in Table 2. Significant increases in mean seasonal DMY were detected for all the grasses at the 262 kg/ha level of soil N. No significant increases in DMY for any cultivar were detected when the soil N level increased to 407 kg/ha, in fact in almost every instance it can be observed that a decrease in yield resulted. The latter DMY trends were also evident for each harvest date.

The percentage of crude protein in the forages at different soil N levels are given in Table 3. Tifton-44 and SS-16 which yielded the lowest seasonal DMY had the highest concentration of crude protein, 8.73 to 10.02%. Limpo and Kleingrass which showed the greatest seasonal DMY had the lowest concentration of crude protein, 6.98 to

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8.08%. Callie was intermediate. Increases in N and/or P level in the soil did not significantly affect protein concentration in Tifton-44 forage. Similar trends in protein contents at different N and P levels were evident for the various forages of other cultivars.

Table 1. Analysis of Variance of the Seasonal DMY of the Grasses as a Function of Soil N and/or P

Source of Variation	DF	PR>F
Replication	3	**
Nitrogen	2	**
N x Rep.	6	N.S.
Phosphorus	2	N.S.
N x P	4	N.S.
N x P x Rep	18	N.S.
Variety	4	**
N x Variety	8	**
P x Variety	8	N.S.
N x P x Variety	16	N.S.

\* Significant at 5% level

\*\* Significant at 1% level

Table 2. Mean Seasonal DMY (kg/ha) of the Forages as a Function of N Level

N Level	Klein	Limpo	Callie	SS-16	Tifton-44
22	7255	8196	6896	6400	7460
262	10588	10290	9977	8555	9044
502	10434	10172	8756	8577	8739

Table 3. Percent Crude Protein in the Forages

	Tifton-44			SS-16	Limpo	Callie	Klein
	PI	PII	PIII	PI	PI	PI	PI
NI.	8.93	8.73	8.70	9.18	6.89	8.03	7.73
NII.	9.14	9.81	8.63	8.64	7.33	8.71	7.04
NIII.	8.80	9.44	8.90	10.02	8.08	8.74	7.41