

INFLUENCE OF NITROGEN AND LIME ON THE $K/(Ca + Mg)$ RATIO OF DINANATH GRASS (*Pennisetum pedicellatum* Trin.)

Dinanath grass (*Pennisetum pedicellatum* Trin.) is an annual which has recently come to prominence as a fodder crop. There is a strong relationship between the $K/(Ca + Mg)$ ratio of the forage and the occurrence of grass tetany (hypomagnesaemia) of cattle, the ratio higher than 2.2 being implicated in the development of tetany symptoms. Experiments on cool season grasses by Thill and George (1975) also revealed similar findings. Khan and AM (1969) and Mayland *et al.* (1975) observed a slight decrease in the ratio by N application, while Fellet *et al.* (1975) recorded an increase in the ratio. Very little work has been done in India on the influence of manuring in Dinanath grass. The present investigation was undertaken to study the changes in the $K/(Ca + Mg)$ ratio of three varieties of Dinanath grass as influenced by nitrogen and lime application in the acid red loam soils of Kerala.

A field experiment was conducted at the College of Agriculture, Vellayani, Kerala, during August to December, 1977. The treatments consisted of factorial combinations of three varieties of Dinanath grass (Pusa-1, PP-15 and JP-12), three levels of N (50, 100 and 150 kg N/ha) and three levels of lime (0.375 and 750 kg lime/ha) laid out in a 3^3 partially confounded experiment. Plant samples were collected just before flowering. Samples were oven dried, ground in the Wiley mill and analysed for the contents of K, Ca and Mg. Potassium was determined by using 'EEL' Flame photometer and calcium and magnesium by the method of Cheng and Bray (1951).

All the varieties had higher values for the $K/(Ca + Mg)$ ratio, than the reported critical value of 2.2 required for the initiation of hypomagnesaemia in cattle. The wider ratio is caused by the lower calcium and magnesium contents of the grass corresponding to high K content (Table 1). The continuous feeding of this grass may therefore result in tetany hazards.

Nitrogen application did not produce any significant change in the ratio. But lime application resulted in a significant reduction. This is because of the increased Ca and Mg contents of the forage without a corresponding increase in the K content, thereby leading to a decrease in the $K/(Ca + Mg)$ ratio.

The authors are grateful to the Kerala Agricultural University and Dean, College of Agriculture for the facilities rendered for this investigation.

Table 1

Chemical composition of Dinanath grass as influenced by nitrogen and lime levels.

Treatments	Potassium %	Calcium %	Magnesium %	Ratio of potassium/ (Calcium + Magnesium)
Varieties				
Pusa-1	2.80	0.25	0.28	5.49
PP-15	2.68	0.20	0.29	5.47
JP-12	2.75	0.23	0.25	5.73
CD at 5%	0.03	0.01	0.02	N S
Nitrogen levels				
50 kg N/ha	2.60	0.21	0.26	5.53
100 kg N/ha	2.79	0.22	0.26	5.81
150 kg N/ha	2.85	0.23	0.29	5.48
CD at 5%	0.03	0.01	0.02	N S
Lime levels				
0 kg lime/ha	2.68	0.18	0.23	6.54
375 kg lime/ha	2.75	0.22	0.27	5.61
750 kg lime/ha	2.81	0.26	0.30	5.02
CD at 5%	0.03	0.01	0.02	0.37

സംഗ്രഹം

‘ദീനനാഥ്’ എന്ന പുൽച്ചെടിയിൽ അടങ്ങിയിരിക്കുന്ന പൊട്ടാസ്യം/(കാൽസ്യം + മഗ്നീഷ്യം) അനുപാതത്തെ പാകുജനക പോഷണം മൂലം വ്യത്യസ്തം വരുത്തുവാൻ സാധിക്കുകയല്ലെന്നും കമ്മായം നൽകുമ്പോൾ വളരെയധികം കുറയ്ക്കുവാൻ സാധിക്കുമെന്നും കാണാൻ കഴിഞ്ഞു.

References

Cheng, K. L. and Bray, R. H. 1951, Determination of Ca and Mg in soils and plant materials. *Soil Sci.*, **72**, 449-458.

Follet, R. F., Power, J. P. Grunes, D. L. Hewes, A. A. and Mayland, H. F. 1975. Potential tetany hazard of fertilized brome grass as indicated by chemical composition. *Agron. J.*, **67**, 810-824.

Grunes, D. L. Stont, P. R. and Brownell, J. R. 1976, Grass tetany of ruminants. *Adv. Agron.*, **22**, 332-369.

Khan, D. H., and AM, M. I. 1969. Mineral balance in grass as influenced by fertility conditions in soil. *J. Sc. Fd. Agric.*, **20**, 671-672.

- Mayland, H. F., Grunes, D. L., Waggoner, H., Florence, A., Hewes, D. A. and Joo, P. K. 1975. Nitrogen effects on crested wheat grass as related to foliage quality indices of grass tetany. *Agron. J.*, 67, 411-413.
- Sullivan, J. T. 1969. Chemical composition of forages with reference to the needs of the grazing animal. A. R. S. 34-107, ARS, USDA. U.S. Govt. Printing Office, Washington, D. C.
- Thill Jones, L. and George, J. R. 1975. Cation concentrations and K to Ca + Mg ratio of nine cool season grasses and implications with hypomagnesaemia. *Agron. J.*, 6, 89-91.

College of Agriculture,
Vellayani, Trivandrum.

C. T. ABRAHAM
C. SREEDHARAN
G. RAGHAVAN PILLAI

(MS Received: 1-1-1979)