Amelioration of Natural Grasslands in the High Ranges of Kerala, India

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Key words : renovated—TDM (tons dry matter)—defoliation—plant introduction—growth rhythm

Introduction Improper natural grassland management in Kerala , India adversely affected its productivity . Problem orientated trials were taken to enhance productivity .

Materials and methods Grassland vegetation was botanically analysed in $5m^2$ plots (4 sub samples) .
Nitrogen effect on grassland was studied using a random block design with 4 replications . Nitrogen was applied at 0 , 40 , 80 or 120 kg/ha as Urea and in two split doses . Gross plot size was $25m^2$, net $5m^2$. Fodder samples were chemically analysed .
Growth rhythm studies were conducted for one year in 52 plots ($1m^2$ each) through weekly harvests . 1 .5 TDM/ha was fixed as the utilizable defoliation stage . Grasslands renovated through plant introduction with improved species like Setaria anceps , Chloris gayana , Brachiara ruziziensis , Macrotyloma axillare , and Desmodium uncinatum and D . intortum . Weeding was accomplished by cutting and light burning . Seed mixture was broadcast . Two methods of covering seed were teste , stirred the soil surface by hand rakeing or trampling by light weight cattle . First light grazing occurred 70-90 days after seeding followed by a weed cut . Plots were top dressed nitrogen at 40kg/ha . No statistically laid out trials , only observational studies .

Results The results identified palatable species of 8 grasses and 1 dicot . Economic optimum drymatter production was 35 .75 TDM/ha with 40kg nitrogen/ha .
Growth rhythm revealed possibility of 5 grazing defoliations with average production 22 .9 kg DM/day in 365 days and 35 .1kilo dm /day in a growing period of 238 days .
Renovated pasture yielded 7 .5 TDM/ha .(30% legumes on dry weight basis) .

Table 1 *Fodder yield in TDM/ha at different levels of nitrogen .*

Years	Nitrogen (Kg/ha)				
	0	40	80	120	160
1967	3 .58	4 .56	5 .70	6 .38	8 .48
1968	3 .16	5 .10	7 .08	8 .30	8 .66
1969	3 .20	5 .34	7 .54	7 .82	9 .56
1970	5 .36	6 .02	7 .26	7 .44	7 .70
mean	3 .82	5 .25	6 .89	7 .48	8 .60
Mean increase in DM Per Kg of N applied (in Kg of DM) .	35 .75	38 .37	30 .50	29 .87	

Table2 *Growth analysis of natural grassland at Mattupatti .*

No .of cuts	Date of harvest	No . of growth days	Yield of DM(T/Ha)	Average Production of DM(Kg/day)
1	13-06-69	49	1 .92	39 .2
2	08-08-69	56	1 .82	32 .5
3	26-09-69	49	1 .58	32 .2
4	31-10-69	35	1 .48	42 .3
5	19-12-69	49	1 .56	31 .8
Average for the production period in the year		238	8 .36	35 .1
Average for the year (365 days)		365	8 .36	22 .9
N :P :K applied : 200 :100 : 200 Kg .ha .				

Conclusion By scientific management , drymatter production and quality was enhanced . (production 3TDM/ha to 9.56 TDM/ha) plant introduction resulted 7 .5 TDM/ha per year of production .

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