Influence of NPK fertilizers on growth and yield of rubber (*Hevea brasiliensis*) in N.E. Region

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ABSTRACT

Rubber trees respond well to fertilizers particularly where soils are deficient in nutrients. This is especially important for the soils of North Eastern region of India where the soils are highly depleted and deficient in essential nutrients. More so, the growth of rubber trees are retarded due to certain unfavorable weather conditions like low winter temperature, high wind velocity, hail storm etc. As a result the immaturity period of the plants are prolonged at least by a year (Mandal *et al.* 1999, Reju *et al.* 2001). Judicious application of NPK fertilizers together with proper agro-management practices could effectively reduce the gestation period of rubber trees. In the present paper the results of two fertilizer experiment being conducted at two locations in North- eastern region (first experiment: Expt I, was laid out at Mendipather, East Garo Hill District of Meghalaya in 1986 with the clone RRIM 600 and the other experiment:Expt II was at Nayekgaon , Kokrajhar, Assam with the clone RRII 105 in 1987) employing two high yielding *Hevea* clones are reported in relation to growth, soil fertility and initial yielding trend. At Mendipather (Expt I) , the experiment was laid out in factorial RBD and consisted of twenty seven treatments with two replications; three levels of N (0, 30 and 60 N kg/ha), three levels of P (0,30 and 60 kg P_2O_5/ha) and three levels of K (0 , 20 and 40 kg K_2O /ha) were applied . At Nayekgaon (EXPT II), the design was also factorial RBD with thirty-six treatments and two replications; four levels of N (0, 20,40 and 60 kg N /ha), three levels of P (0, 20 and 40 kg P_2O_5/ha) and three levels of K (0, 20 and 40 kg K_2O/ha) were employed. Girth at a height of 150 cm from bud union was recorded twice in a year and girth increment and percentage of tappability of plants were computed. Soil samples were collected every year during February/March and analysis for OC and available P&K content. Cuplump yield (g/t/t) of the clone RRII 105 at Expt II was recorded. Both the experiment was conducted in Planter's field. Application of nitrogen is found to increase the girth and percentage tappability of plants significantly in both the experiments during immature phase and at the end of seven years after planting (YAP) a girth difference in

the tune of 9.6 to 11.1 cm was observed between the plants receiving nitrogen and without nitrogen for the clone RRII 105 and RRIM 600 respectively. While the clone RRIM 600 responded upto 60 kg N ha^{-1}, the response of clone RRII 105 was only up to 40 kg ha^{-1}. The influence of phosphorus on growth was not significant for both the clones during immature phase. However, application of potassic fertilizers gave a positive and significant effect only for clone RRII 105. A dose of 20 kgK_2O ha^{-1} was found optimum. Significant differences due to application in percentage tappability for both the clones were also observed. Application of N up to 60 kg/ha gave significant increase in yield during initial years of tapping for the clone RRII 105. The fertility status of surface soils was markedly improved as a result of application of NPK fertilizers.

Table 1: Influence of N application on growth of *Hevea* clones

Nitrogen Levels (kg ha^{-1})	RRII 105 (7 YAP)			Nitrogen Levels (kg ha^{-1})	RRIM 600(7 YAP)		
	Girth (cm)	Girth increment (cm)	Tappability (%)		Girth (cm)	Girth increment (cm)	Tappability (%)
0	35.2	30.6	10.8	0	35.8	30.7	8.7
20	41.6	36.7	36.8	30	40.5	35.2	24.4
40	44.8	39.8	57.4	60	46.9	41.4	73.5
60	43.2	38.4	55.4	CD (P=0.05)	2.98	3.12	18.6
CD (P=0.05)	2.6	3.1	14.5				

References:

Mandal, D., Singh, R.P., Mondal, G.C., Gohain, T., Chaudhuri, D. and Varghese, Y.A. (1999). Impact of agroclimate on growth and establishment of *Hevea* clones during immature phase. National Symposium on Plant Physiology and Biochemistry in relation to agriculture and Environment, P-22, 15-17th, February at DAVV, Indore (M.P.).

Reju, M.J., Thapliyal, A.P., Deka, H.K. and Varghese, Y.A. (2001). Growth performance of Hevea clones in sub-tropical Meghalya. Journal of Plantation Crops, 29(1): 22-26.

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Dose	RRII 105 (7 YAP)			Dose	RRIM 600(7 YAP)		
	Girth (cm)	Girth increment(cm)	Tappability (%)		Girth (cm)	Girth increment(cm)	Tappability (%)
N0	35.2	30.6	10.8	N0	35.8	30.7	8.7
N20	41.6	36.7	36.8	N30	40.5	35.2	24.4
N40	44.8	39.8	57.4	N60	46.9	41.4	73.5
N60	43.2	38.4	55.4	CD(5 %)	2.98	3.12	18.6
CD (5%)	2.6	3.1	14.5				

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