

# A REVISED FERTILIZER RECOMMENDATION FOR THE NORTH EASTERN REGION: IMMATURE PHASE

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The most important criteria for evolving fertilizer recommendations are the soil fertility which is governed by physio chemical behaviour of the soil, crop response in terms of growth and yield and the climatic conditions. For a crop like rubber which is highly sensitive, the dynamics of the nutrient elements which is dependent on the various soil properties achieve importance and hence the nutrient management practices evolved are to be based on the soil type.

The cultivation of Hevea was traditionally confined to a narrow tract in the south west of India mostly in the state of Kerala. The present fertilizer recommendation being followed by the Board is based on the data generated in this tract. The introduction and cultivation of Hevea though dates back to early sixties, to the North East a real boost on the extension of crop was achieved only in the early 1980 s. However, since the area under rubber was very limited, based on the scanty information available, it was felt that the recommendation followed in the traditional tract could be followed in NE region also. Now that there is rapid extension of area under this crop in this region and also since more scientific information is available on the

nutrient requirement, the recommendation being followed at present is felt inadequate for this region calling for a revision. The soil test crop response studies are a must before evolving any fertilizer recommendation and though these studies have been initiated by the RRST, considering the perennial nature of the crop it would take a few more years before results would be available nutrient status of the soil would give an indication of the fertilizer requirement of the crop. Data on this is available generated during the nutrients for soil test purpose (Table 1a, 1b). These data could be used to refine the existing recommendation after taking into consideration the trend of results obtained from various field trials being conducted by the Regional Research Stations in this region.

The organic Carbon status which is an index of available nitrogen though can be classified as medium as per the critical levels finalised by the RRII, compared to organic carbon content of soil of Kerala, Karnataka and Tamil Nadu (rubber growing tracts) this, is not high enough. Considering that the soil is highly degenerated due to indiscriminate jhumming which is preceded by burning of

organic debris and also taking into account heavy nutrient removal through a large amount of thatch grass, a higher input of nitrogen would be essential to sustain a better growth. The availability of phosphorus is extremely low pointing to the necessity of increasing the dose of phosphorus in the fertilizer recommendation. The content of potassium also is none too satisfactory. The mineralogical studies conducted revealed the presence of a very high amount of illite when compared to soils of Kerala, Karnataka and Tamil Nadu and this warrants higher potassium doses. This would also be justified by the comparatively high available magnesium status which not only confirms the present recommendation to skip magnesium from fertilizer schedule, but also to increase the dose of potassium to counter the possible deleterious effect due to higher amount of magnesium. The results obtained so far from field experiments also indicate a positive response to high level of nutrients. The trials on nutrient requirement during immature phase of Hevea planted with poly bag plants reveal that higher doses of nutrients (100% increase during first year, 25% increase during second year, 20% increase during third year and

25% increase during fourth year than the prevailing recommendation) result in higher growth (10.37% over the conventional recommendation in Table II). The results also indicate that better response is achieved when a higher fertilizer schedule is followed from the first year itself when planting material used is poly bag plants. Our experience so far while offering discriminatory fertilizer recommendation as evidenced by the data furnish-

ed (Table III) also confirms the need for a higher dose of nutrients during immature phase in this region. The data shows that about 90% of the cases have been recommended

a higher dose which falls within our proposed revised recommendation. In view of the facts mentioned, the following recommendation is suggested.

Recommendation			
Year	Existing	Revised Conventional budded stumps	Poly bag plants
	N P K Kg/Ha.	N P K Kg/Ha.	N P K Kg/Ha.
1	10:10 (5) : 5	14 : 14 (7) : 7	**

TABLE I a

## AVAILABLE NUTRIENT STATUS OF SOILS IN THE DIFFERENT STATES OF N. E. REGION

	Depth (cm)	Tripura (439)	Assam (137)	Meghalaya (15)	Mizoram (5)	Manipur (1)
Organic Carbon	0-30	0.72	0.90	0.99	0.98	0.82
%	30-60	0.57	0.69	0.76	0.86	0.67
Av. Phosphorous	0-30	0.32	0.27	0.66	0.87	0.22
mg/100 gm.	30-60	0.21	0.23	0.49		0.12
Av. Potassium	0-30	4.50	5.98	7.49	9.14	3.1
mg/100 gm.	30-60	4.00	4.77	5.78	7.91	5.5
Av. Magnesium	0-30	4.93	8.30	8.74	17.25	1.09
mg/100 gm.	30-60	4.53	7.34	8.15	11.66	1.82
pH (H <sub>2</sub> O)	0-30	4.45	4.67	4.78	4.91	4.60
1:2.5	30-60	4.41	4.64	4.70	4.76	4.80

TABLE I-b  
FERTILITY RATING

	Depth (cm)	Tripura (439)			Assam (137)			Meghalaya (15)		
		L	M	H	L	M	H	L	M	H
Organic Carbon	0-30	56.6	32.33	11.0	36	59	5	N	100	N
%	30-60	75	25	N	61	37.4	1.6	40	60	N
Av. Phosphrous	0-30	95.5	4.5	N	95.8	4.2	N	80	20	N
mg/100 gm.	30-60	97	3	N	97	2	1	90	10	N
Av. Potassium	0-30	51.2	47.0	1.8	30	66	4	50	50	N
mg/100 gm.	30-60	58	42	N	30	67	3	60	40	N
Av. Magnesium	0-30	4	21	75	N	1.5	98.5	10	N	90
mg/100 gm.	30-60	7	26	67	N	1	99	10	N	90
Carbon %	Phosphrous mg/100 gm.	Potassium mg/100 gm.			Magnesium mg/100 gm.			N-Nil		
L - L 0.75	L 51	L 5			L 1			L-Low		
M - 0.75 - 1.5	1 - 2.5	5 - 12.5			1 - 2.5			M-Medium		
H > 1.5	> 2.5	> 12.5			> 2.5			H-High		

TABLE II  
TRIAL ON NUTRIENT REQUIREMENT DURING IMMATURE PHASE OF  
HEVEA PLANTED USING POLY BAG PLANTS

Girth in c. m. recorded in October 1988.

Treatments					Mean girth cm	Increment %
	I year	II year	III year	IV year		
T <sub>1</sub>	10:10:5	40:40:20	50:50:25	40:40:20	16.39	21.94
T <sub>2</sub>	10:10(5) :5	40:40(20):20	50:50:25	40:40:20	16.51	21.93
T <sub>3</sub>	20:20:10	40:40:20	50:50:25	40:40:20	16.85	21.39
T <sub>4</sub>	20:20(10):10	40:40:20 (20)	50:50:25	40:40:20	16.51	22.56
T <sub>5</sub>	20:20:10	50:50:25	60:60:30	50:50:25	17.54	23.78
T <sub>6</sub>	20:20:10 (10)	50:50:25 (25)	60:60:30	50:50:25	18.09	22.89



TABLE III

## \* CASES OF DEVIATION FROM THE BOARD'S EXISTING RECOMMENDATION

Age of the plantation	Upto 25%	25-50%	50 %
	(1)	(2)	(3)
II nd year	-	90.9	9.09
IIIrd year	83.33	16.66	-
IV th year	7.6	69.2	23.2
V th year	-	100.0	-
VI th year	21.05	-	78.94

\* Percentage of holdings where the discriminatory fertilizer recommendation offered was more than the existing recommendation. Column (1) indicates the percentage of holdings where discriminatory fertilizer recommendation offered was upto 25% more than the existing recommendation, Column (2), where the recommendation was 25 to 50 percent more and Column (3) where doses were 50 percent more than the existing recommendation.

II	40:40(20):20	50:50(25):25	50:50(25):25
III	50:50:25	65:65:35	65:65:35
IV	40:40:20	50:50:25	50:50:25

- \*\* a/ If the planting is done with poly bags during April/May a first round of application @ 14:14 (7):7, two to three weeks after planting followed by another round @ 25:25(12.5):12.5 during September/October may be done.
- b/ If planting is done during August one round of fertilizer NPK @ 25:25(12.5):12.5 may be applied.

The recommendations offered are only a first approximation and refining is essential based on soil test crop response studies. The provisional recommendation suggested is based on the results obtained from Tripura. The existing

available data on soils of other North Eastern states also are more similar to that of Tripura soils and hence it is felt that the recommendation for these states could be made on an adhoc basis also and this in any

case would suit better than that of the recommendation of traditional region being followed in the NE region at present.

The rainfall pattern also makes it exceedingly essential to have a reschedule of the time of the fertilizer application. The present emphasis being on the popularisation of the polybag as the planting material and also since there is considerable variation in the planting time the recommendation during the first year has to consider the above points also.

If planting is done with polybag plants in April/May, one month after planting one round application of NPK at the rate of 14:14 (7):7 Kg. per ha. may be done, followed by a dose 25:25 (12.5):12.5 Kg. in September/October. However if planting is completed only in August/September one application of NPK at the rate of 25:25 (12.5):12.5 kg. per ha can be recommended one month after planting. Wherever covercrop has not been established from fourth year onwards the fertilizer recommendation should be NPK 75:50:30 in two split applications during pre and post monsoon periods. For areas where cover crops have been established a dose of NPK @ 35:35:35 Kg per ha. will hold good up to the tapping stage.

