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LATEX YIELD AND TREE GROWTH IN KANCHANNAGAR RUBBER ESTATE OF BANGLADESH – A PRELIMINARY STUDY

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Rubber (*Hevea brasiliensis* Muell. Arg.) is a perennial, hardy and moderately quick growing tree of the tropical regions (Khisra 1991). An initiative of its cultivation was taken in Bangladesh during 1960-61 considering the multiple uses of the latex and its products including the utility of timber (Chowdhury 1974). In Bangladesh, experts recommended its cultivation in the hilly land, terrace mostly evaluating the land suitability class and within the limitation of climatic factors (Hasan 1983). Bangladesh Forest Industry Development Cooperation (BFIDC) sent a proposal to Bangladesh Forest Research Institute (BFRI), Chittagong to find out the causes of latex yield variation in the rubber station of Rangamatia and Doluchari of Kanchannagar Rubber Estate of Fatick Chhari Upazila of Chittagong District. Thus, a preliminary study was conducted on these rubber gardens during 2007-08.

The clones in those estates are RRIM-600, PBIG/GG, GT-1 and PB-235, which were planted during different planting years (BFIDC 1993). Management of the Doluchari garden was comparatively better than Rangamatia. Total number of trees in Doluchari and Rangamatia is 29850 and 36149 respectively. Two (2004-06) years latex yield records showed that average productions were 3.16 kg/tree/yr for Doluchari and 1.86 kg/tree/yr in Rangamatia. The latex yield variation may be due to different factors, viz: site quality, management efficiency, age group of clones, etc (Anon. 1989).

Ten soil samples from 0-15 and 15-30 cm depths were collected from plantations of each year of the study areas. Each composite soil sample consisted of 6-9 cores depending on the spot variability in the site. To assess the tree growth, girth at breast height (1.3 m) and height of stem at branch height (m) were measured. Number of cyclone affected and fire burnt trees were compiled from manager office. Taper categories: permanent, contact and peace meal varied which were taken into consideration as those influencing latex production. Soil analyses were done in the laboratory of Soil Science Division, Bangladesh Forest Research Institute, Chittagong following the standard methods (Jackson 1973). Tapers of different categories were selected randomly.

Soil was similar, finer texture in the sub soil which indicated better moisture retaining capacity that is suitable for rubber plantation (Table 1). Soil pH, organic matter and N content showed no significant difference between the gardens, though the value of organic matter content was slightly higher in Doluchari garden. Less leaf litter accumulation per unit area Rangamatia may be due to low tree density.

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TABLE 1. PHYSICAL AND CHEMICAL PROPERTIES OF SOIL OF KANCHANNAGAR RUBBER ESTATE DURING JANUARY'08.

Rubber station	Soil depth (cm)	Soil texture	pH (H ₂ O)	OC (%)	OM (%)	Total-N (%)
Doluchari	0-15	Sandy clay loam	4.90	0.80	1.37	0.052
	15-30	Clay loam	4.88	0.58	1.00	0.050
Rangamatia	0-15	Sandy clay loam	4.80	0.58	1.00	0.050
	15-30	Clay loam	4.79	0.57	0.98	0.048

There was no significant variation between the mean height, GBH, latex production and tree lace and cup lump (TC) between the two sites (Table 2).

TABLE 2. LATEX YIELD AND GROWTH OF TREES AT DOLUCHARI AND RANGAMATIA OF KANCHANNAGAR RUBBER ESTATE DURING JANUARY'08.

Plantation year	Observation number	Average			
		Height (m)	GBH (cm)	Latex yield (cc/tree/day)	TC (gm/tree/day)
Doluchari					
1983	200	3.36	70.68	55.83	1.50
1984	Ditto	3.73	68.56	37.50	0.75
1985	Ditto	2.96	84.87	40.83	0.75
Mean		3.33 ± 0.39	74.57 ± 8.89	44.72 ± 9.76	1.00 ± 0.43
Rangamatia					
1986	200	4.03	73.58	48.33	1.00
1987	Ditto	3.47	76.39	36.67	0.67
1988	Ditto	2.75	57.53	47.06	0.92
Mean		3.42 ± 0.64	69.17 ± 10.2	44.02 ± 6.39	0.86 ± 0.17

Values are shown as mean ± SD for triplicate measurements

The average tree height at branch level was higher for Rangamatia (3.42 m) than Doluchari (3.33 m) which may be associated with tree density. Low density at Rangamatia possibly provided more soil area and light to exploit nutrient for better growth. Average GBH, latex yield and tree lace and cup lump were higher in Doluchari than Rangamatia. Calculated latex yield (360 kg/task/yr) and tree lace + cup lump (7 kg/ha) were higher in

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Doluchari than Rangamatia. Physiological condition of trees at Rangamatia was relatively poor possibly due to density of trees.

TABLE 3. AVERAGE LATEX YIELD (KG) VARIATION DURING HIGH PRODUCTION PERIOD AT KANCHANNAGAR RUBBER ESTATE DUE TO TAPER CATEGORIES IN 2007.

Rubber station	Taper category	Months		
		November	1 st half of December	2 nd half of December
Dolu Chhari	Permanent	36.80±1.58	34.50±0.79	30.25±0.96
	Peacemeal	47.26±1.66	45.86±1.80	41.90±0.89
Rangamatia	Permanent	32.00±1.00	29.43±0.89	23.24±0.78
	Peacemeal	36.57±1.90	33.20±0.49	27.65±0.67

Values are shown as mean ± SD for triplicate measurements

Latex yield in case of peace meal taper was higher than the permanent in both sites (Table 3). In the 1st half of December'07, average latex yield data at Kanchannagar were lower than November'07. From the 2nd half of December'07, latex yield showed decreasing trend. Results suggest that production of latex in Doluchari was better than Rangamatia.

Production of crop is related with 51 factors (Brady and Weil 1995). But here only a few of them have been related. Number of burnt tree was 82% and 40% in Rangamatia during 1986 and 1988 respectively while that was the least in Doluchari. Burning effects on bark favoured reduction of latex in Rangamatia. Moreover, cyclone affected trees were more than 70% in the year 1991 in Doluchari but in Rangamatia that was about 80-90%. Rehabilitation was done during 1994-95 but that did not bring cost effective value in consideration of latex yield. The Dry Rubber Content (DRC) was 24-25% at Doluchari and 23.51-23.75% at Rangamatia. There was no valid ground of lower DRC concentration except poor field management at Rangamatia. Manpower development and rejuvenation of plantation at Rangamatia needs prime attention.

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