

Growth performance of a trial rubber plantation in Bastar region of Chattisgarh State

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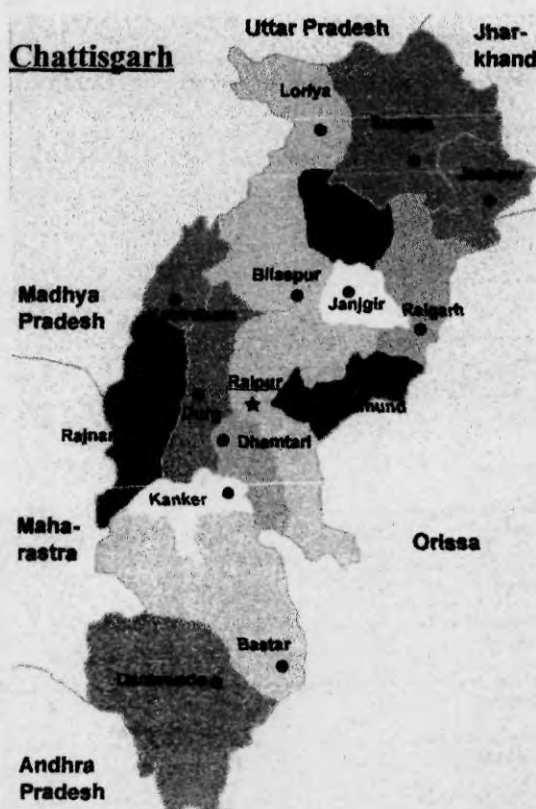
Introduction

In order to meet the ever growing demand for natural rubber, every possible means to increase the production should be done. Increasing the productivity and establishing plantations in all possible regions are the ways to increase production. Most of the potential areas in traditional region (8° to 12° North latitude) were brought under rubber and no further large scale expansion is possible in this region. Considering the limitations in the availability of land in traditional area and the ever growing demand of natural rubber, the need for extension of rubber cultivation to marginal areas to meet the demand of natural rubber was recognized (Sethuraj *et al.*, 1989).

Bastar, a dry sub humid region of (earstwhile Madhya Pradesh State) Chattisgarh state was one of the new potential regions identified for natural rubber (*Hevea brasiliensis*) cultivation and expansion. Bastar, a tribal dominated region, before being spilt in to three districts, was one of the largest districts in India. It remained as a district of Madhya Pradesh till 2000, with an area of 39171 km², which was even greater than the Kerala State. Bastar region is situated between 17° 46' and 20° 34' North latitude and 80° 15' and

82° 15' East longitude with a general elevation of 600 meters above sea level.

The Bastar region experiences dry sub humid climate. Only limited information is available about growth performance of different clones of *Hevea* under dry sub humid regions of Maharastra



and Madhya Pradesh (Nazeer *et al.*, 1992; Chandrashekar *et al.*, 1996 and Krishan *et al.*, 2007). The objective of this article is to analyse the growth performance of a trial plantation, growing naturally without following standard cultural practices and proper management recommended for rubber, growing under environmental constraints in Bastar region.

The trial plantation was laid out in 1985-86, at Jagadapur (19° 07'N, 82° 3'E, 552 m above sea level). The planting was done on plain land with uniform soil status. The soil is acidic in nature with high contents of iron and low contents of potash and lime.

The Rubber Board established the trial plantation

with the help of State Horticulture Department. Direct stump planting, mainly of RRIM 600, was done. The tree to tree spacing was 4.5 m x 4.5 m. Planting was laid out following the standard practices (Rubber Board, 1984).

On completion of the planting the Rubber Board handed over the plantations to State Horticulture Department. After seven years, they transferred it to the adjoining Mata Rukamani Ashram.

The plantation is in a road side without any boundary protection and is in an almost abandoned state. It is infiltrated by the rural mass. Other technical reasons has also made it appropriate to be termed as unmanaged plantation. The plantation thus grew naturally without any standard cultural

Table1. Weather parameters of the plantation site (1990-2002)

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	Rainy days
	T max	T min	RH max	RH min		
January	28.2	10.6	89.5	37.6	14.0	1.0
February	31.4	13.8	81.0	30.4	5.5	1.0
March	34.8	18.1	69.2	24.0	6.9	1.0
April	36.8	22.1	64.5	24.7	30.6	2.0
May	39.3	24.2	63.3	32.9	85.9	4.0
June	32.1	23.4	78.5	57.6	210.9	7.7
July	28.5	22.9	88.4	74.2	395.0	15.5
August	28.0	22.4	91.2	76.9	361.3	14.7
September	29.6	22.3	90.0	71.0	214.3	10.3
October	29.8	20.2	89.6	60.3	120.0	4.7
November	28.5	15.6	89.5	53.0	23.8	0.9
December	27.1	9.7	89.6	41.9	2.8	0.1
Mean/Total	31.1	18.7	82.0	48.7	1470.4	73.0



Fig 1. Trial rubber plantation in Bastar region

practices. Irrigation was also not done at any stage.

The growth parameters were recorded to assess the performance of the plantation, in the new region of introduction, with environmental constraints. The girth of the stem at a height of 150 cm above ground level, during the 16th year after planting, was taken. Girth of all the survived 648 (which is approximately 60 percent of originally

planted plants) trees were recorded. Observations on branching height, number of primary branches and bark thickness were recorded from randomly selected 90 trees, so as to cover the entire existing plantation. Bark of the trees however was severely damaged, found very hard, flaky with tumor formations.

The plantation site is having dry sub humid climate. The region received a mean annual rainfall

Table 2. Growth performance of rubber plantation (16-years after planting)

Clone	Mean girth (cm)	First branching height (m)	Number of primary branches	Bark thickness (mm)
RIM 600	46.5	2.5	2.8	3.9
(Range)	(26.0 – 84.5)	(2.3 – 2.9)	(1.0 – 6.0)	(3.5 – 5.6)
General mean	46.5	2.5	2.8	3.9
Co-efficient of variation	18.5	5.8	36.7	23.2

of 1470 mm with 73 rainy days, almost wholly confined from June to September. The maximum rainfall was recorded in July. The highest mean maximum temperature of 39.3°C was recorded during the month of May with annual mean of 31.1°C. The highest mean minimum temperature of 24.2°C was observed in May, against the lowest minimum of 9.7°C in December. Mean average relative humidity in morning and evening hours recorded was 82.0% and 48.7% respectively (Table 1).

The growth characteristics after sixteen year of planting is shown in Table 2. Girth ranges from 26.0 cm to 84.5 cm. The planted clone RRIM 600 has attained mean average girth of 46.5 cm. The higher range of girth values suggests that promising growth of trees is possible in the region, if the recommended cultural management practices are followed.

Variations were observed in first branching height, number of primary branches and bark thickness. The range of first branching height varied from 2.3 m to 2.9 m; with an average population mean of 2.5m. Primary branch number also varied from one to six branches, with an average mean of 2.8 per tree. Bark though severely damaged and was not very thick, ranging from 3.5 mm to 5.6 mm, with an average mean of 3.9 mm for the existing population (Table 2).

The satisfactory performance (though with wide range of variations) of RRIM 600 clones here even without following scientific cultural practices and under other environmental stress clearly shows that rubber can be grown well in this region. Another study on the performance of experimental rubber clones in the same region also has established that performance of rubber is promising in the Bastar region of Chattisgarh State (Krishan *et al.*, 2007 & 2011).

Conclusion

The satisfactory performance of the rubber plantation under the stressed conditions and other studies in the region suggest that it is possible to grow rubber in the Bastar region of Chattisgarh State. Expected desirable growth and yield of rubber could be achieved by providing recommended cultural practices and irrigation during the initial years of planting.

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