INCREASING PRODUCTIVITY OF RUBBER (*HEVEA BRASILIENSIS*) THROUGH HIGH DENSITY PLANTING IN NORTH EAST INDIA

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Received: 25 October 2021 Accepted: 24 October 2021

Dey, S.K. (2021). Increasing productivity of rubber (*Hevea brasiliensis*) through high density planting in North East India. *Rubber Science*, **34**(3): 230-236.

A long term field trial was conducted under sub-humid climatic condition at Agartala to study the effect of planting density on growth and yield of *Hevea brasiliensis,* clone RRII 429. Performance under six planting densities *viz*. 408, 445, 489, 544, 613 and 699 trees ha^{-1} was evaluated. Growth of the plants was significantly influenced by different densities only after the sixth year. Growth and yield per tree decreased with increasing planting density. Plants at the lower density showed high girth increment in all the years and produced thick virgin bark. Higher density resulted in lower girth, bark thickness and higher crotch height. However, it was vice-versa in the case of yield per hectare due to increase in number of trees under tapping with increasing planting density. From the study it appeared that the highest seven year average yield could be obtained at the density of around 613 trees ha^{-1}. However, planting density of 544 trees ha^{-1} gave the highest Benefit-Cost Ratio (BCR) and Internal Rate of Return (IRR) indicating that it is the economically viable planting option for North-East India.

Keywords: Density, Growth, *Hevea*, North East India, Rubber plantation, Yield

INTRODUCTION

The continuing decline in the availability of cultivable land and rising land costs together with mounting demand of natural rubber, have given thrust to the concept of high density planting of Natural Rubber (*Hevea brasiliensis*). High density planting is one of the important methods to achieve high productivity per unit area. The growing space largely influences tree growth and yield of a stand as a whole. The influence of spacing depends on a number of factors like clone, site characteristics, climatic conditions, management *etc*. However, growth and yield were strongly influenced by planting density in rubber (Obouayeba *et al*., 2005; Roy *et al*., 2005; Dey and Pal 2006; Varghese *et al*., 2006; Dey and Datta, 2013; Philip *et al*., 2014). High plant population adversely affects plant growth, while suboptimal plant population results in high yield per plant but lower yield per unit area. High plant density leads to competitive shading within the canopy, thereby limiting interception of radiation. Increasing plant density enhances intra-plant competition, decreasing growth of single plant. It also affects the canopy architecture, leaf area, dry matter production and ultimately, the economic productivity of rubber. Optimum

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