

# NATURAL RUBBER PLANTATION: A NUTRITIONALLY SELF-SUSTAINING ECOSYSTEM

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A field experiment investigating the effect of skipping of fertilizer applications for one or more seasons or years on growth and yield of mature rubber was conducted in a 10-year-old mature rubber plantation of clone RRII 105 at Kodumon Estate, Kerala representing the traditional rubber growing tract in India. The experiment consisted of seven treatments, viz. 30:30:30 N, P and K /ha/year applied in two split doses *i.e* pre-monsoon and post-monsoon, full dose as pre-monsoon (current recommendations), half the dose as pre-monsoon, half the dose as post-monsoon, skipping during alternate years, skipping for two years and application every third year and continuous skipping (without any fertilizer for seven years). Observations on growth, yield, soil and leaf nutrient status, and bark thickness were recorded periodically for a period of seven years. It was observed that the growth and yield of rubber were not significantly influenced by withdrawing the application of fertilizers for a period of seven years. The annual yield from 2002 to 2009, the girth increment (2002-2009) and the cumulative yield during the period did not show any significant difference among the treatments. The soil and leaf nutrient status six years after the commencement of the experiment also did not indicate any significant difference among the treatments, indicating that a mature *Hevea* plantation can be considered as a partially self-sustaining ecosystem with a constant cycle of uptake from and return of nutrients to the soil. Therefore, it appears that in well-maintained areas with favourable terrain, adequate manuring during the immature phase and where leguminous cover crop was established, it is possible to skip fertilizers at least for a short period. However, in steep terrains with highly eroded and impoverished soils, manuring mature rubber may be essential.

**Keywords:** Fertilizer response, *Hevea*, Nutrient dynamics, Yield

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## INTRODUCTION

Natural rubber is a prominent plantation crop of considerable significance to Indian economy. Manuring is an important agromanagement practice during both immature and mature phases of rubber. Improved growth and vigour during the immature phase are often associated with fertilizer application, but various fertilizer experiments in mature rubber did not give

consistent positive yield response and in many cases, absence of response was observed (George, 1962; Punnoose *et al.*, 1994; Jessy *et al.*, 2004). Rubber plantations present an environmentally acceptable replacement for native forest, being a closed ecosystem with a constant cycle of uptake and return of nutrients from and to the soil (Watson, 1989). The establishment and maintenance of legume ground cover during