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ADDITION OF LITTER, ITS DECOMPOSITION AND NUTRIENT RELEASE IN RUBBER PLANTATIONS IN TRIPURA

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A study of litter fall from rubber trees, litter in standing crop and their decomposition was carried out for a period of two years at Agartala, Tripura, North East India. Annual litter fall was estimated in a 14 year old rubber plantation of clone RRIM 600 which had a density of 317 mature rubber trees per ha. Litter samples were collected at monthly intervals from 12 traps randomly placed in an area of one ha. The total annual litter fall ranged from 6.8 to 7.8 t per ha. Leaf litter accounted for 66 per cent of the total litter and the major portion of the leaf fall occurred from January to March. There were no significant differences in litter production between two consecutive years. Maximum litter in standing crop occurred in March and it decreased progressively as the rates of decomposition increased. Nutrients ranging from 94 to 130 kg of N, 5 to 6 kg of P, 22 to 25 kg of K, 106 to 168 kg of Ca and 17 to 33 kg of Mg were returned to the soil through total litter fall. Decomposition of leaf and petiole litter was studied for a period of 360 days. After 120 days a weight loss of 16-21 per cent was observed for leaf litter, whereas a higher weight loss of 28-30 per cent was observed for petiole litter indicating faster decomposition of petioles. As the decomposition progressed, the concentrations of K, Mg and Ca decreased markedly. Decomposition quotient (K_t) for leaves ranged from 1.97 to 2.92, for twigs from 3.24 to 4.06 and from 2.28 to 3.20 for petioles. The total quantity of leaf fall in the mature plantation in Tripura and the nutrient return through litter was comparable to that in the traditional rubber growing tracts.

Key words : Decomposition, *Hevea brasiliensis*, Litter, Nutrient release.

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INTRODUCTION

The rubber tree, *Hevea brasiliensis*, is native to the rain forests of the Amazon basin lying within 5° latitudes south and north of the equator. The climate prevailing in this region is of wet equatorial type (Strahler, 1969) with no marked dry season. Commercial plantations of the crop were first extended to South East Asia in areas with similar latitude and climate. In India, rubber cultivation was confined till 1960 to the South West part of the country, mostly in Kerala State and Kanyakumari district of Tamil Nadu and also in the Andaman and Nicobar islands located between 8 to 12°N latitudes (Krishnakumar and Meenattoor, 2000). However, due to the non-availability of land in the traditional belt, rubber cultivation has been extended to non-traditional regions (Menon, 1980; Menon and Unny, 1990). Attempts to grow rubber in India at 20 to 28°N and in China at 18 to 24°N have been successful, in spite of the fact that the crop faces various stress conditions in these areas (Krishnakumar and Meenattoor, 2000). Rubber cultivation is being undertaken in large tracts in this state giving it the second place in the country in terms of area under rubber cultivation. Although rubber cultivation has become popular in Tripura, being an introduced crop, it is necessary to understand the ecological impact of this crop on a long-term basis.

Rubber plantations present a 'closed' ecosystem with a constant cycle of uptake