

BIOMASS PRODUCTION AND NUTRIENT BUDGETING OF *HEVEA BRASILIENSIS* IN SOUTH INDIA

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The biomass accumulation and total nutrient content in twenty year old rubber (*Hevea brasiliensis*) trees was quantified by weighing the entire tree by destructive sampling and analysing the nutrient content in different parts of the tree. The balance sheet of nutrients for a planting cycle was worked out, and comparison was drawn between rubber (after three cycles) and forest ecosystems for nutrient reserve and depletion in soils. The branches and trunk accounted for 80 per cent and the roots comprised about 15 per cent of the total dry matter on whole plant basis. The concentration of nitrogen in the leaf and bark exceeded that in the branches and trunk, while calcium concentration in the bark was greater than that in the wood / leaf by factors ranging from five to forty times. In general, major portion of nutrients was accumulated in the branches and trunk and was in the order of $Ca > N > K > Mg > P$. Balance sheet of nutrients indicated that a substantial amount of all the nutrients was removed through biomass and there was a calcium deficit. The depletion of potassium and calcium at 60 cm depth was considerably higher in rubber cultivated soils compared to forest soils. The 'R' factor (per cent of cultivation within the cycle of fallowing and cropping) worked out for rubber plantation in South India was 12.5 per cent, which makes it an agro-forestry ecosystem closely resembling the rain forest.

Key words: Biomass, *Hevea brasiliensis*, Nutrient balance, Nutrient depletion, uptake.

INTRODUCTION

In the commercial cultivation of rubber (*Hevea brasiliensis*), trees are cut down and removed after the completion of the economic life span of 30-32 years and the area is replanted. The removal of massive amounts of biomass through timber results in significant recycling of nutrients. Rubber plants take 4 to 5 years for canopy closure and grow to full sized trees in 15 to 20 years. The biomass accumulation and total nutrient content of the plant in its growth cycle is a basic requirement for assessment of nu-

tritional requirement. However, information in this regard is scanty. Some workers (Watson, 1964; Shorrocks, 1965b) have assessed the nutrient cycle of rubber plantation with reference to soil nutrient content. These data were utilized to formulate recommendations for manuring, particularly of mature rubber. The present investigation attempts to quantify the amount of biomass accumulation by mature *Hevea* plants and the nutrients removed due to felling and clearing of trees. The balance sheet was prepared considering addition and removal of nutrients for a planting cycle. A compara-