

## ROOT EXCAVATION STUDIES IN A MATURE RUBBER (*HEVEA BRASILIENSIS* MUELL. ARG.) PLANTATION

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A sixteen year old rubber (*Hevea brasiliensis*) plantation was subjected to a study on root distribution pattern using the logarithmic spiral trench method. Considerable variation in root intensity was observed for different soil depths and lateral distances sampled. Total root intensity was maximum in the upper 0-10 cm soil layer for all the lateral distances. The soil zone lying within 3 m lateral distance from the base of the tree and at 30 cm soil depth accounted for almost 70 per cent of the total roots for the rubber trees studied. This forms the zone of root activity for most of the field intercrops. However, crops with limited root spread can be intercropped with rubber under quantum planting. Also, there is a scope for integrating deep-rooted multi-purpose trees with rubber.

Key words: Intercropping, Natural rubber, Root distribution, Root excavation, Root intensity.

### INTRODUCTION

Natural rubber (*Hevea brasiliensis* Muell. Arg.) is one of the important commercial crops of Kerala State in India, occupying a total cultivated area of 4.75 lakh ha. During the initial year of establishment of a rubber plantation the land use efficiency is low, with rubber occupying only one fifth of the area when planted under normal spacing (6.1 x 3.0 m in hill areas and 4.6 x 4.6 m in flat lands), offering wide scope for intercropping. Moreover, the time lag of five to seven years between planting and opening for tapping for latex, poses major problems to smallholder farmers as no income is generated. Intercropping with suitable food or cash crops can ensure not only higher productivity and resource capture, but also income during the establishment phase of the plantation.

Competitive interaction among the component crops for various site resources

are the strong determinants for the establishment of multispecies cropping systems. Competition for space, light, water and nutrients are important among these. Root distribution pattern perhaps, plays a cardinal role in the uptake of water and minerals, thereby affecting the growth and development of the constituent crops. Hence, sound knowledge of the below-ground dynamics involving root distribution pattern, fine root structure, rooting intensity and lateral and vertical root spread are essential for developing intercropping systems involving tree crops. The present study aims to characterize the root distribution pattern of rubber trees and explore the possibility of intercropping.

### MATERIALS AND METHODS

#### Study site and selection of trees

The study was conducted in a rubber plantation established in the year 1987 in