

IMPACT OF NATURAL RUBBER CULTIVATION ON NUTRIENT STATUS IN TROPICAL SOILS: A CASE STUDY IN KERALA, INDIA

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The impact of rubber cultivation on soil can be assessed precisely if the changes are monitored in the same field itself at different stages of growth. Accordingly two fields in the second cycle of rubber cultivation in the farm of Rubber Research Institute of India, Kottayam, were selected and monitored for soil organic carbon, pH and available nutrients at the beginning of the cycle, after eight years and at the end of the cycle. A decline in soil organic carbon status was observed in both the fields after eight years. However, after 25 years, in both the fields a significant increase was noted. Available phosphorus and potassium improved towards the end of the cycle. It is observed that the available calcium was maintained at the end of the cycle, though an increase was noted in between. The changes in available magnesium status in soil was different in the two fields, however, both the fields maintained the 'medium' status throughout the period of cultivation. Soil pH changes were also slightly different in the two fields. In one field, a slight decrease was noted compared to the initial status while in the other a reverse trend was recorded. In general, in both the fields an increase in organic carbon and available form of nutrients in soil was observed towards the end of the cultivation cycle.

Key words: Available nutrients, Nutrient changes, Organic carbon, Organic matter, Rubber cultivation.

INTRODUCTION

The organic matter and available nutrient status of any agricultural soil system depends to a large extent on the type of crops grown, its duration and the associated cultural and management practices (George *et al.* 2012; Li *et al.* 2012; Abraham, 2015). Addition of organic matter through manures and inorganic nutrients through chemical fertilizers is common in any modern agriculture system, but, their input quantity widely varies among different crops. So also there can be large

variations in input of organic matter through litter fall and crop residues in different crop systems such as annuals or perennials.

The normal economic life span of natural rubber tree is 25 to 30 years and the life cycle normally begins in an area after clearing all natural vegetation. After five to six years of growth, the canopy of rubber trees crosses over and organic matter addition through annual litter fall takes place substantially (Philip *et al.*, 2003, Jessy *et al.*, 2009). The rubber trees attain enough girth by the seventh year for the harvest to start with.