

TEMPORAL VARIABILITY IN SOIL NUTRIENT STATUS IN A RUBBER PLANTATION AND AN ADJACENT FOREST

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Ambily, K.K., Ulaganathan, A., Satisha, C.C. and Jessy, M.D. (2009). Temporal variability in soil nutrient status in a rubber plantation and an adjacent forest. *Natural Rubber Research*, 22(1&2): 99-105.

Tree-based land use systems have more closed nutrient cycling within the system. Quantification of seasonal variation in nutrient flows and stocks is important in development of sustainable land use systems, especially in low-fertility soils of the humid tropics. The present investigation was aimed at analysing the temporal variations in soil nutrient availability in a rubber plantation *vis-a-vis* a nearby forest ecosystem in eastern high range part of Kerala. Soil samples were collected from the rubber plantation and the adjacent forest at bimonthly intervals and analysed for soil nutrient availability. High sand, less clay and silt and low CEC were observed in rubber plantation compared to forest. Soil pH, organic carbon and available K were high in the forest soil compared to rubber soil. However, soil available P status was higher in rubber soil. Temporal variations in soil pH, organic carbon and available K contents were observed both in rubber and forest soils. Significant seasonal variation in P availability was observed only in the surface soil of forest. The variation pattern of soil pH, organic carbon and available K contents differed in rubber and forest soils.

Keywords: Forest, Nutrient availability, Rubber, Seasonal variation, Soil properties.

INTRODUCTION

Agricultural systems with perennial crops especially tree plantations are more sustainable than systems with annual crops. Tree-based land use systems are known to maintain soil organic matter and nutrient cycling through the addition of litter and root residues into the soil. Rubber plantations have a closed nutrient cycling and inorganic fertilizers are applied routinely so that soil fertility decline is less likely to occur. Nonetheless, quantification of seasonal variation in soil nutrient availability is an

important step in maintaining soil productivity and development of sustainable land use system, especially in low fertility slope - land soils of Kerala. Seasonal differences in nutrient availability are important for different species which differ in their growth habit and their seasonal nutrient requirements (Gupta and Rorison, 1975). The present investigation was aimed at quantifying the seasonal variations in soil nutrient availability in rubber relative to forest ecosystem in eastern high range part of Kerala.

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