Natural Rubber Research, 21 (1&2):98-103, 2008

ORGANIC PHOSPHORUS STATUS OF THE MAJOR SOIL SERIES UNDER RUBBER CULTIVATION IN SOUTH INDIA

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Prasannakumari, P., Joseph, M. and Nair, N.U. (2008). Organic phosphorus status of the major soil series under rubber cultivation in South India. *Natural Rubber Research*, 21(1&2): 98-103.

Ten soil profiles representing the major soil series under rubber (*Hevea brasiliensis*) in the traditional rubber growing areas of South India were studied for total, organic and available P status. The total P in the profiles ranged from 112-794 ppm. The organic P ranged from 64-676 ppm and constituted 61 - 86 per cent of the total P. Available P status of the soil in general was very low and ranged from 1-82 ppm. The total, organic and available P contents in general, were high in the surface soil and declined gradually with depth. As the organic P status of the soil is high the plants' P requirement may largely be met from the organic pool. The routine soil analysis do not cover P from this pool, which to some extent explains the observed lack of response of rubber to P fertilization.

Key words: *Hevea brasiliensis*, India, Phosphorus, Soils.

INTRODUCTION

The soils of the traditional rubber (*Hevea brasiliensis*) growing tract in India, comprising Kerala and parts of Tamil Nadu are highly weathered and are mostly laterite and lateritic, developed under warm humid equatorial monsoon or tropical wet and dry monsoon climates. Red and alluvial soils are also seen in these areas. According to modern soil taxonomy, these soils were grouped into 62 series under three orders *viz.*, ultisols, inceptisols and entisols. Majority of the soils belong to ultisols and are moderately deep to very deep (NBSS &LUP, 1999). These are low base status soils with consequent higher acidity. Texture of these soils ranges between loamy and clayey. The clay content increases down the profile. Organic matter status of these soils is high because of the large quantity of litter additions through the leguminous cover crops and annual leaf fall of rubber. The system is reported to be nutritionally self sustaining (Krishnakumar and Potty, 1992., Sivanadyan *et al.*, 1995). These soils are deficient in available P, due to high fixation of applied P by hydroxides of Fe and Al (Karthikakuttyamma *et al.*, 1991; Osodeke and Kamalu, 1992). According to NBSS & LUP, (1999), 75 per cent of the soils in the traditional rubber growing tract are low in available P (<10ppm). Inorganic P fractions in the traditional rubber growing soils (comprising less than 25 per cent of the total P) is dominated by Fe-P followed by Al-P (Karthikakuttyamma *et al.*, 1991). Though the larger part of total P is in organic form,

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