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INFLUENCE OF RUBBER CULTIVATION ON PHYSICO-CHEMICAL PROPERTIES OF SOIL : A CASE STUDY

The commercial cultivation of rubber (*Hevea brasiliensis*) in north eastern (NE) region of India began in the early part of eighties and in Assam, about 11,000 ha of land has already been planted with rubber. The NE India represents a fragile eco-system mainly due to indiscriminate felling of trees, shifting cultivation being practiced for years and high degree of soil erosion, which may cause reduction in water balance, depletion in soil microbial activity and break in nutrient recycling. In this context, rubber plantation may be in effect considered as agro-forestry, which will not only give an excellent cover to the already denuded soil but also restore soil productivity besides generating new employment avenues. Improvement in soil physical properties and build up of soil microflora has been reported from rubber plantations adopting proper agromanagement practices in NE India (Krishnakumar *et al.*, 1990; 1991). This note reports the observations on the influence of rubber cultivation on physico-chemical properties of soil in comparison to an adjacent fallow land.

The present study was undertaken at Nayekgaon in the Kokrajhar District, Assam in a rubber plantation raised since 1989. The area, which was traditionally cultivated with teak, saal and other high value timber, is situated about 75 m above msl and receives an annual rainfall of around 2000 mm. The rubber plants selected for this study were opened for tapping in 1995. No fertilizers were applied to the plants except for an occasional application of farmyard manure.

Six representative soil samples were collected from both the plantations and the nearby fallow land at depths of 0-30 cms and 30-60 cms for estimating physico-chemical properties of soil. Core samplers were used to estimate bulk density and particle density. Mean weight, diameter and aggregate stability were determined by wet sieving method (Baruah and Barthakur, 1997). Organic carbon, total as well as available NPK and exchangeable cations were determined following standard procedures (Jackson, 1973). Available micronutrients were determined by methods described by Singh *et al.* (1999). Soil samples at depths of 0-15 and 15-30 cms were also collected from both the sites in order to estimate the population density of different groups of micro-organisms.

Physical analyses of soils from the two sites are presented in Table 1. Both the soils were clay loam in texture (sand : 22.4 – 24.8%; silt : 33.2 – 35.7% and clay : 38.3 – 40.8% under rubber and sand : 25.2 – 27.5%; silt : 34.2 – 35.2% and clay : 36.8 – 40.3% under fallow land). Bulk density and particle density of the soils under rubber were found to be more or less similar to that of fallow land. This