Indian Journal of Natural Rubber Research, 13(1&2) : 46-55, 2000

SOIL NUTRIENT STATUS OF SLOPE LANDS UNDER *HEVEA BRASILIENSIS* IN MIZORAM AT VARYING ALTITUDES AND THEIR RELATIONSHIP WITH SOIL PROPERTIES

G.C. Satisha, S.K. Dey, T.K. Pal and Y. Annamma Varghese

Satisha, G.C., Dey, S.K., Pal, T.K., and Varghese, Y.A. (2000). Soil nutrient status of slope lands under *Hevea brasiliensis* in Mizoram at varying altitudes and their relationship with soil properties. *Indian Journal of Natural Rubber Research*, 13(1&2) : 46-55.

The status of nutrients in the soils of slope lands under *Hevea brasiliensis* in Mizoram at different altitudes (100-750 m above mean sea level) was determined for better understanding of nutrient availability and crop productivity. The soils were low to medium in available nitrogen. About 74 per cent of the soils could be rated as deficient in Bray's-P. The total and available N, P and K contents, in general, was in the order of K>N>P. The soils contained adequate to toxic amounts of DTPA extractable Fe, Mn, Cu and tested low in available Zn especially for soils of higher elevation. Total and available N and P and DTPA extractable Zn had a significant negative relationship with altitude whereas DTPA-Fe and Cu were positively related. There was positive influence of silt on total N and of both organic carbon and silt on $KMnO_4$-N. The total and Bray's-P were significantly positively related with pH, silt and clay content. The NH_4OAc-K was positively related with CEC. The silt and clay contents had negative influence on DTPA extractable Fe and Cu while DTPA-Zn was positively related with silt, clay and pH.

Key words : Altitude, *Hevea brasiliensis*, Mizoram, Slope lands, Soil characteristics, Soil nutrients.

G.C. Satisha (for correspondence), Rubber Research Institute of India, Regional Research Station, Kolasib–796 081, Mizoram, India; S.K. Dey, T.K. Pal and Y. Annamma Varghese, Rubber Research Institute of India, Regional Research Station, Agartala–799 006, Tripura, India.

INTRODUCTION

Slope lands are one of the most fragile of agricultural resources. The utilization of these slope land areas need attention, because unfavourable natural conditions can cause rapid soil erosion. Soil erosion by water accounts for about 55 per cent of total degradation of land (Oldeman, 1994) and soil losses of 200 to 300 t per ha per year are common. The vegetation at the soil surface slows down the surface flow and induces deposition and effectively controls the soil loss (Hashim, 1996). In tropical tree-crop ecosystems such as rubber (*Hevea brasiliensis*), leaf litter accumulates as a result of periodic leaf fall, providing a form of surface cover over the soil. In addition, leguminous cover crops and terracing help to reduce soil erosion while the trees are still immature (Soong *et al.*, 1980). In a mature rubber plantation the amount of litter fall is in the range of 4620 to 5320 kg per ha per year (Moris, 1993) and the decomposition of this litter plays an important role in soil nutrient recycling.