EFFECT OF CROP RESIDUES/LITTER AND NATURAL FLORA IN RUBBER PLANTATIONS ON SOIL pH AND CONTENT OF CATIONS

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Despite the increasing concerns about soil degradation and environmental sustainability of farming systems, very little efforts were taken so far to understand or exploit the inherent resilience of natural processes to sustain ecosystems. An incubation experiment was conducted in the laboratory of Rubber Research Institute of India during 2017-18 to study the effect of recycling various plant materials on soil properties. Residues/ litter of intercrops and natural flora grown in rubber plantations were incorporated into the soil and soil pH and available cations were determined after 90 days. Nutrient content of plant materials recycled back to the soil varied considerably. Irrespective of the type of vegetation, incorporation of residues/litter increased soil pH, though the magnitude of increase varied. More than ten fold increase in potassium content was observed in soil after incorporating with litter of broad leaved weeds and banana residues. Leaf litter from cocoa and coffee increased soil calcium (Ca) status significantly, whereas soft weed litter improved soil magnesium (Mg) status significantly in all the soils. The results showed the advantages of retaining vegetation, either intercrops or weeds in improving/sustaining soil fertility status and the need for making attempts for exploiting the ecological advantages of soft weeds and crop diversity in improving soil pH and content of cations in soils.

Keywords: Cover crop, Litter, Natural flora, Residues, Rubber plantation

Addition and transformation of above and below ground biomass is an important ecological process which influences the carbon (C) and nutrient fluxes in ecosystem. Quality and quantity of biomass added influence the rate of decomposition and the amount of nutrients and acidity/alkalinity released in to the soil and thus soil properties (Xu *et al*., 2006). Microbial immobilization of nutrients in soil will also influence the temporal changes in soil nutrient status. Several authors have suggested the appropriate litter and residue management for bringing desired changes in soil property (Marschner and Noble, 2000; Betterly *et al*., 2013).

In rubber plantations, several annual and short term crops like banana, pineapple, different vegetable and tuber crops and perennial crops like coffee, cocoa *etc*. are cultivated as intercrops. When intercrops are not cultivated, either leguminous cover crops are established or natural vegetation is allowed to grow. Apart from these, several

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