

EFFECT OF INTEGRATED NUTRIENT MANAGEMENT ON SOIL QUALITY AND GROWTH OF *HEVEA BRASILIENSIS* DURING THE IMMATURE PHASE

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Integrated nutrient management through bio-fertilizers, green manure and chemical fertilizers can sustain soil quality and improve plant growth. An experiment was conducted to study the effect of integrated nutrient management through a bio-fertilizer consortium consisting of *Azotobacter* sp., *Phosphobacteria* (*Bacillus* sp.), *Pseudomonas* sp. and K-mobilising bacteria (*Fracturia* sp.) along with green manure, *Gliricidia* and chemical fertilizers (NPKMg) on soil quality and growth of natural rubber (*Hevea brasiliensis*) during the immature phase. The experiment was initiated in a farmer's field at Yenthayar, in Kottayam district, Kerala in 2007 and continued for five years till, 2011. The results showed that the organic carbon, total N and available forms of K, Ca and Mg in soil were significantly higher in the treatment with chemical (50 % of the recommended dose of NPKMg) and bio fertilizers, green manure under natural cover compared to the control treatment viz., 100 per cent recommended dose of NPKMg in *Mucuna* ground cover. It was also observed that in the same integrated treatment, the soil quality indices viz., soil respiration rate and permanganate oxidizable soil organic carbon were also significantly high compared to the control indicating the beneficial effects of integrated nutrient management through chemical fertilizers, bio-fertilizers and green manure (*Gliricidia*). The input of chemical fertilizers can be reduced to half upon integration with bio-fertilizers and green manure for immature rubber. No significant difference in growth of rubber plants could be observed among the different treatments.

Keywords: Bio-fertilizer, *Gliricidia*, Green manure, Integrated nutrient management, *Mucuna bracteata*, Natural ground cover, Rubber

INTRODUCTION

Nutrient management through inorganic chemical fertilizers is a common practice in almost all the agricultural crops, so also in the case of natural rubber (*Hevea brasiliensis*). Except for the addition of about 12 kg of farm yard manure in the planting

pit initially, most of the farmers apply only chemical fertilizers for nutrient management in their fields. It is a fact that the soil health of the rubber fields of the initial planting cycle could not be sustained in the subsequent planting cycles, instead a declining trend is observed as the planting

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