

ABSTRACT

The agronomic potential of rubber factory effluents as a source of N, P and K for rubber and paddy plants was investigated. Rubber serum obtained from coagulation tanks of a crepe rubber factory, was tested as the 'rubber factory effluent'. Different dilutions of effluent and fertilizer-effluent combinations were evaluated on plant growth, plant nutrient composition, yield and soil parameters in a series of investigations. Clone PB 86 of rubber was tested in one green house trial and one large scale field experiment and variety of BG 94 - 1 of paddy was tested in four green house experiments. Attempts were also made to determine the effect of land application of rubber effluent on soil moisture status at different depths under the field conditions in mature rubber plantations.

Significant increases in soil and plant nutrient contents and soil pH, were observed due to effluent application, in all experiments. Significant increases in plant growth and yield were also recorded in green house experiments.

Experiment conducted on young rubber seedlings showed that half dilution is more effective than other dilutions, with regard to plant growth. The effects of recommended fertilizer and effluent - fertilizer combination were observed to be similar in most of soil and plant parameters.

Field experiment was carried out according to a randomised block design and specially manufactured storage tanks and electric pumps were used for land application trials. Application of undiluted and diluted forms of effluent on mature rubber in field trials appeared to be equally effective in increasing leaf N, P, K, Mg contents and soil P, K, Mg contents. No significant changes in soil organic carbon, nitrogen, sodium and iron contents were evident even after one year of effluent application on land. A slight increase in latex production was also observed during this period.

It was clearly observed that even undiluted effluent has a good potential as a fertilizer for paddy without any adverse effects on growth. Plants treated with recommended fertilizer, undiluted effluent and fertilizer-effluent combination gave almost similar grain yields.

Possibility of substituting different fertilizer components of recommended fertilizer mixture for paddy was investigated. A better response was observed with recommended NPK level in the early stages of growth. However, at latter stages all serum and fertilizer treatments showed similar effects on plant growth.

The cumulative effects of previously applied effluent on paddy plants, were evaluated after the harvesting of previous experiment. All effluent (serum) combinations were equally effective as the recommended fertilizer, with regard to plant height. 'Serum only' and serum + PK treated paddy plants gave higher yields than the recommended NPK level. There were no adverse effects on plant growth or soil characteristics even after the continuous application of effluent during the two seasons in paddy cultivation.