Abstract

A study was carried out to find out the effect of different fertilizers on the growth of coconut seedlings, availability of some nutrients and soil microbial activities. Eight months old coconut seedlings of CRIC 65 cultivar was planted in large plastic pots (45 cm x 55 cm) and kept inside the green house at Coconut Research Institute, Lunuwila, Sri Lanka. Each pot was filled with Madampe series soils of Latosols which belongs to the land suitability class S_1 of coconut growing soils. Six treatments were selected with three replicates as follows with 1 Kg of Dolomite as the basal dressing. Treatments were Control (T1), Inorganic Fertilizer (T2), BioGold (T3), cattle manure (T4),Kochchikade biofertilizer (T5) and compost (T6).The growth performances of seedlings were measured by taking seedling girth, seedling height, number of leaves per seedling and total leaf area. The measurements were recorded before and eight weeks after application of treatments. For the soil chemical analysis, soils were tested monthly for pH, EC (Electrode Conductivity) and macro and micro nutrients P, K and Mg. The microbial activities were also investigated monthly by measuring microbial biomass carbon and CO_2 evolution. The experiment design was a Complete Randomized with three replicates. The data were analyzed by using the analysis of variance (ANOVA) and significant means were compared by Least Significant Design (LSD) using the MINITAB programme. At the end of the research period no significant difference ($P>0.05$) was observed in growth parameters in any of the treatments. Similarly, none of the treatments were able to make a significant effect on soil pH ($P=0.499$) and EC ($P= 0.100$) throughout the research period. This revealed that none of the above treatment can be recommended as treatments to alter soil pH and EC. The significantly highest available Phosphorous (P) level was observed in inorganic fertilizer treatment whereas BioGold, cattle manure, Kochchikade biofertilizer and compost have shown effect of soil P levels. In the Potassium (K) analysis, all the treatments except inorganic fertilizer treatment had shown a high K level in soil after a six months period. In the analysis of Mg level in the soil, a significant increment was shown in the treatments where cattle manure was incorporated. By considering this result, it is possible to recommend cattle manure as a good fertilizer to increase the Mg level in a particular soil. A high acceleration of microbial activity was observed in BioGold and compost treatments. Cattle manure and Kochchikade biofertilizer had a similar effect with inorganic fertilizer showing the lowest activity. This was even lower than the control. Considering all the above facts, generally it is possible to conclude that, cattle manure is a good source of Mg. It can be further stated that inorganic fertilizers are more fast and effective on increasing the available P level in a soil compared to the organic and biofertilizers. However, the contribution of inorganic fertilizer for K increment was not considerable. Further, on the soil microbial aspect, it is not favorable since it negatively affected the microbial activities. Therefore it is important to consider all these facts before selecting a fertilizer to obtain the maximum benefit from coconut lands.