Improvement of Soil Nutrient Levels by Adding Different Combinations of Organic Amendments

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Inadequate supply of mineral nutrients to the field crops had been identified as one of the reasons for the yield gap in Sri Lanka. Supplementing plant nutrients at adequate levels is a key aspect in increasing crop productivity. Therefore, this study was conducted to improve the nutrient levels of soil using different organic amendments. Representative soil samples were collected from 20 sampling points of farmer's field having *calcic red yellow latosols* and soil physical properties texture and bulk density, chemical properties such as pH, electrical conductivity, , organic matter, micro and macro nutrients were determined in Horticultural Crop Research and Development Institute. An incubation study was conducted to assess the effect of application of different combinations of dried natural amendments such as cow dung, *Gliricidia* leaves, , *Palmyrah* leaves, palmyrah char and cow urine on available nutrient content of soil. Treatments used in the study were $T_{1:}$ (Cow dung + Palmyrah leaves (chopped) + cow urine + char), $T_{2:}$(Cow dung + Palmyrah leaves (chopped) + cow urine + without char),$T_{3:}$(Cow dung + Palmyrah leaves (chopped) + *Giliricidia* + char),$T_{4:}$(Cow dung + Palmyrah leaves (chop) + *Giliricidia* + without char),$T_{5:}$(Cow dung + Palmyrah leaves(ground) + cow urine + Char),$T_{6:}$(cow dung + Palmyrah leaves(ground) + cow urine + without Char),$T_{7:}$ (Cow dung + Palmyrah leaves (Ground) + *Giliricidia* + char), $T_{8:}$ (Cow dung + Palmyrah leaves (ground) + *Giliricidia* + without char) and control (T9). Amount of soil, gliricidia , palmyrah leaves, cow dung and cow urine used in each treatments were 60 g, 0.5 g, 1 g and 5 ml respectively. Results analysed in CRD desgn using *SAS/STAT® 9.2* for the incubation study, revealed that application of cow dung and urine, with palmyrah leaves and char (T5) was best combination of amendments which increased P From 28.32ppm to 53.93 ppm, K from 134.78 ppm to 183.08 ppm, S from 14.28 to 25.05 ppm,Mg from 358.21 to 423.65 ppm and Ca from 808.23 ppm to 1003.40 ppm where the percentage of increase is higher than other treatments during 60 days of incubation period .Ground form of palmyrah leaves application was found better than chopped form application and char application revealed better effect than treatments applied without char. However all the treatments increased the nutrient availability than control during incubation which indicates the possibility of using these amendments in the field to improve the fertility of soil.

Key words: Bio char, *Giliricidia,* Incubation, Macro nutrients, Micro nutrients