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Effect of different types of enriched composts on soil fertility

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ABSTRACT

A green house experiment, using amaranthus (Var CO 2) as test crop, was conducted to assess the effect of raw and composted waste materials *viz.*, bananapseudostem / sugarcane trash applied in conjuction with 100 per cent and 75 per cent of the RDF, respectively, on soil fertility status, and to compare their influence with the application of 100 per cent RDF alone and the absolute control. The availability of macro, secondary and micronutrients, organic carbon content and CEC were enhanced markedly with either poultry manure enriched microbial inoculum / *Trichoderma viride*/ bananapseudostem compost / sugarcane trash compost each applied @ 750 kg ha^{-1} conjointly with 75 per cent of the RDF, affirming the effect of enriched compost over that of unenriched compost / inorganic fertilizers with and without raw base materials.

Key words : Raw waste, Bananapseudostem composts, Sugarcane trash composts, Nutrient availability, Organic carbon content, CEC.

Productivity of soils cannot be sustained with the fertilizers alone. Application of fertilizers alone has led to deterioration in health and productivity of our aerable soils. It has been realised that organic manures also form part of the manurial schedule to maintain the productivity of soils (Vasanthi and Kumaraswamy, 1999). So recycling of different organic wastes, as composted manures would be a good source of organic manures to improve the soil fertility, besides ensuring hygienic disposal of the organic wastes. The present study was taken up to find out the effect of different types of enriched composts on soil fertility.

MATERIALS AND METHODS

A green house experiment was conducted at Tamil Nadu Agricultural University, Coimbatore, to assess the effect of different types of enriched composts on soil fertility status. The experiment was conducted with twenty treatments in a randomized block design with three replications. The treatments consisted of eight treatments for composted bananapseudostem and sugarcane trash separately, 100 per cent recommended dose of fertilizer (RDF) alone and absolute control *i.e.*, F_0C_0: absolute control; F_1C_0: recommended dose of fertilizer (RDF) (75:0:25 kg N, P_2O_5 and K_2O ha^{-1}, respectively); F_1C_1: raw base material @ 5 t ha^{-1} + 100 % RDF (75:0:25 kg N, P_2O_5 and K_2O ha^{-1}, respectively); F_2C_2: cow dung slurry compost @ 750 kg ha^{-1} + 75 % RDF (56.25:0:18.75 kg N, P_2O_5 and K_2O ha^{-1}, respectively); F_2C_3: sewage sludge compost @ 750 kg ha^{-1} + 75 % RDF; F_2C_4: microbial inoculam compost @ 750 kg ha^{-1} + 75 % RDF; F_2C_5: microbial inoculam, urea enriched compost @ 750 kg ha^{-1} + 75 % RDF; F_2C_6: microbial inoculam, poultry manure enriched compost @ 750 kg ha^{-1} + 75 % RDF; F_2C_7: *Trichoderma viride* compost @ 750 kg ha^{-1} + 75 % RDF; F_2C_8: *Trichoderma viride*, urea enriched compost @ 750 kg ha^{-1} + 75 % RDF; F_2C_9: *Trichoderma viride*, poultry manure enriched compost @ 750 kg ha^{-1} + 75 % RDF.

Ten kilogram of soil was weighed and placed in earthen pots. The calculated quantity of raw and composted base materials along with 100 per cent RDF (75:0:25 kg N, P_2O_5 and K_2O ha^{-1}, respectively) and 75 per cent RDF (56.25:0:18.75 kg N, P_2O_5 and K_2O ha^{-1}, respectively), respectively as per treatment details were applied and thoroughly mixed with soil in each earthen pot. The treatments which received composts of bananapseudostem / sugarcane trash @ 750 kg ha^{-1} along with 75 per cent of the RDF, the quantity of N and K_2O supplied through the composts were deducted from 75 per cent RDF (56.25:0:18.75 kg N, P_2O_5 and K_2O ha^{-1}, respectively), and the remaining quantity of N and K_2O were applied through fertilizer. The soil samples were collected at post harvest stage of amaranthus from each treatment. The collected soil samples were processed and analysed for their macro, secondary and micronutrients content, organic carbon and cation exchange capacity.

RESULTS AND DISCUSSION

Major nutrients:

The soil available nitrogen at post harvest stage of amaranthus increased considerably and significantly in