

Effect of composts and time of incubation on soil properties

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ABSTRACT

An incubation experiment was conducted to study the effect of raw and composted bananapseudostem and sugarcane trash waste on soil properties. Two hundred and fifty gram of soil was taken in polythene containers, to which calculated quantity of raw and composted waste materials along with 100 per cent RDF and 75 per cent RDF (as recommended for amaranthus), respectively were added as per the treatment schedule and mixed thoroughly. The moisture content was maintained at field capacity throughout the experimental period (60 days). The soil samples were drawn at 15, 30, 45 and 60 days of incubation and analyzed for their organic carbon content and cation exchange capacity. With the advancement of incubation period, there was an increase in organic carbon content and cation exchange capacity of soil upto the end of incubation period.

Key words : Composts, Incubation period, Organic carbon, CEC.

Maintenance of soil organic matter is a practical problem in tropical countries like India. Hence, the application of organic residues is a must for the maintenance of fertility level of these soils. The type of organic residues, no doubt, influences the quality as well as the quantity of humus formed to a great extent. But the suitability of an organic residue to be used in the field will be determined by its decomposability as well as the pattern of mineralization of nutrient elements contained therein. Organic manures play a very important role in maintaining the productivity of soil. An incubation experiment was conducted to assess the effect of bananapseudostem / sugarcane trash composts on soil properties.

MATERIALS AND METHODS

An incubation experiment was conducted at Tamil Nadu Agricultural University, Coimbatore, in completely randomized block design with twenty treatments and three replications to evaluate the effect of raw and composted base materials viz., bananapseudostem and sugarcane trash applied with 100 per cent (F_1) 75 per cent (F_2) of the RDF, respectively on soil properties in a sandy clay loam soil. The treatments consisted of the application of base materials, as raw (C_1) and as composts, prepared with cow dung slurry (C_2) and sewage sludge (C_3) the starter materials, microbial inoculum, the accelerating material with out enrichment (C_4) and with urea enrichment (C_5) / poultry manure enrichment (C_6), *Trichoderma viride* – the other accelerating material, without enrichment (C_7) and with urea enrichment (C_8) / poultry manure enrichment (C_9). In addition, there were two more treatments, (i) application of 100 per cent RDF

alone (F_1C_0) and (ii) absolute control (F_0C_0). Two hundred and fifty gram of soil sieved through 2 mm sieve was taken in polythene containers, to which calculated quantity of raw (0.625 g) and composted base materials (0.094 g) along with 100 per cent RDF as recommended for amaranthus (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 were added as per the treatment schedule and mixed thoroughly. 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 was incubated for two months after the incorporation of the treatments. The moisture content was maintained at field capacity throughout the experimental period. The soil samples drawn at 15, 30, 45 and 60 days of incubation were analyzed for their organic carbon content and CEC.

RESULTS AND DISCUSSION

Organic carbon content and CEC:

With the advancement of the incubation period, there was an increase in organic carbon content and cation exchange capacity upto the end of incubation period (60 days, fixed on the basis of the duration of amaranthus, which is forty days).

The application of bananapseudostem / sugarcane trash composts prepared with microbial inoculum / *Trichoderma viride* and enriched with poultry manure significantly increased the organic carbon content (Table