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Characterization and composting of poultry manure compost and its effect on yield of maize

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ABSTRACT

Composting of poultry manure cage litter and deep litter with organic and inorganic additives in various combinations were taken up and change in chemical and biochemical properties over the period of composting were studied. The composts were tested for efficiency interms of agronomic productivity using a test crop. The organic carbon, C: N ratio, lignin, cellulose and total phenol contents decreased where as nutrient content and humic substances increased during composting. After four months, humic substances were higher in compost treatments compared to poultry manure kept for aging. Compost treatments recorded higher dry matter yield of Maize over control (100% RDF+FYM @ 10 t ha^{-1}). Composted poultry manure cage litter treated with sericulture waste, green manure, cowdung and urea with 50 per cent RDF recorded a maximum of 257 per cent increase in dry matter yield of maize over control and fresh poultry manure treatments.

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Key words : Poultry manure, Composting, Fodder maize, Yield and nutrient uptake

INTRODUCTION

Waste resource utilization has increased enormously and, therefore, its disposal has assument serious dimensions. The organic materials are of different kinds like city garbage, sewage effluents', crop residue, vegetable wastes and poultry manure etc. Among the different kind of wastes poultry manure plays a vital role in agriculture because it is rich source of essential plant nutrients which have been used successfully in improving soil fertility for many centuries India accounts for 500 million chicken populations with a production of 3.8 million tonnes poultry manure. Poultry manure is rich in macro and micro nutrients.Direct application of poultry waste to field is not suggested because of its higher alkaline nature and leaching of nitrate nitrogen, which leads to nitrogen loss. Hence, there is a need to use a composting technology for efficient conversion of poultry wastes. The present investigation is an attempt to convert this poultry waste into compost using locally available organic materials. The manurial value of the compost was evaluated in the field using maize as a test crop.

MATERIALS AND METHODS

To formulate the protocol for synthesis of poultry manure based composts, composting was carried out in heap method following six treatment combinations using different additives. The poultry manure cage litter (PMC) and poultry manure deep litter (PML) with coir pith and sericulture wastes formed the base materials. The organic additives were cow dung and sunhemp. Coir pith and sericulture waste @ 20%, cow dung @ 5%, sun hemp @15% were used and these were added on fresh weight basis. The design was completely randomized design with 6 treatments replicated thrice. Treatments were poultry manure cage litter (PMC) + coir pith + sun hemp + cow dung (C_1), poultry manure deep litter (PML)+ coir pith + sun hemp + cow dung (C_2), PMC + sericulture waste + cow dung (C_3), PML+ sericulture waste + cow dung (C_4)

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