

EFFECT OF AERATION ON PRODUCTION RATE AND NUTRITIONAL LEVEL OF ENRICHED COMPOST

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Agricultural activities tend to generate a substantial volume of animal and crop residues. Composting is the most economical and ecologically sustainable option to manage farmyard waste. However, it takes approximately three months to complete decomposition and contains lower plant nutrients percentage compared to inorganic fertilizers. This study aimed to reduce the decomposition time and improve nutrients content of compost. Aerobic decomposition was enhanced by aeration inside the pile using a blower with $0.5 \text{ Lmin}^{-1}\text{kg}^{-1}$ air flow. Paddy straw, poultry manure, goat manure, cattle manure, and paddy husk ash were mixed in 3:1:1:1:1 ratio respectively as the raw materials and 3% of *Eppawala* rock phosphate was added to the mixture in weight basis. Six piles; (150x100x80 cm) were prepared and 3 piles were aerated for six hours per day. Other 3 piles were left to decompose under ambient condition as the controls. According to the results, aerated and control piles took 35 days and 65 days respectively to complete the decomposition. Total N, available P, exchangeable K, C/N ratio, pH, EC, and (Cation Exchange Capacity) CEC were analysed in compost samples from aerated (after 35 days) and controls, and the results were, 20.5 gkg^{-1} , 1.8 gkg^{-1} , 10.4 gkg^{-1} , 7, 8.8, 4.3 mScm^{-1} , 19.3 cmolkg^{-1} and 17.8 gkg^{-1} , 1.5 gkg^{-1} , 9.9 gkg^{-1} , 8.5, 8.8, 3.64 mScm^{-1} , 21.3 cmolkg^{-1} respectively. Data were analysed using SAS 9.0 software with 95% confidence interval. The results revealed that, there is a significant increment in total N, exchangeable K, C/N ratio, EC, and CEC in aerated piles compared to controls. And the nutrient composition of both methods were significantly higher than commercial compost. Therefore, it can be concluded that, decomposition time can be effectively reduced and nutrient level can be increased by artificial aeration and nutrient enrichment respectively. However, further studies are recommended to study the economic feasibility.

Keywords: Force air circulation, Enriched compost, Decomposition, Plant nutrients