

Compost Physical Properties Study on Degradation of Poultry Manure Composting in Closed-Aerated Composter

Abstract

A variety of parameters including physical, chemical, and biological properties of different input materials contribute to different composting performance. This study aimed to investigate the compost physical properties (bulk density, porosity, specific surface area and water holding capacity) on the composting process at different initial moisture content (MC). The degradation of total organic carbon (TOC) for the compost inoculated with *Bacillus coagulans* (BC) and effective microorganism (EM) was determined. The composting materials consisted of 50 % sawdust, 12 % chicken dung and 38 % rice husk with a fixed initial C/N ratio of 30. A closed-aerated composter was fabricated with an optimum air flow rate of 0.3 L/min.kg compost to avoid O₂ limitation for 7 d of composting. The compost temperature was recorded to exhibit the active reaction between microorganisms and compost materials will generate a considerable amount of heat. The effect of the initial MC of the compost bed has been intensively investigated with regards to compaction analysis and compost particle for the composting inoculated with BC or EM in an aerated closed-system composter. The results showed that composting using the single strain of BC provides comparable results to that degraded by the commercial mixed culture EM.