822/B

Effect of manual turning on the rate of degradation of household composting

R.K.V. Chandima* and W.B. Yapa
Department of Zoology, Faculty of Science, University of Colombo, Colombo

Aeration is a key element in composting. Effect of aeration on the rate of degradation of household composting was studied by maintaining ten household composting bins, where the contents in five composting bins were turned (T) manually every week to facilitate aeration (experimental bins), while the other five bins (control) were maintained without turning (NT). All the bins were placed in the same location, in the Kesbewa Urban Council area, where all the ten bins were exposed to the same environmental conditions. The study duration was 16 weeks. The changes in the Volatile Solids Content (VSC) was used to measure the rate of degradation and changes in moisture content (MC) and temperature was used as indicators of proper functioning (or malfunctioning) of microbial activity. The VSC and MC in all ten bins were measured on a weekly basis and temperature variation was measured daily.

The VSC reduced in both the experimental and control bins throughout the study. It was reduced by 44% and 35% at the end of the process of the experimental bins and control bins, respectively. This decrease was more pronounced during the initial four weeks. There was no significant difference ($p>0.05$) in the changes of the VSC and there by the rate of degradation in the experimental and control bins. Although all the bins showed a decreasing trend in MC, there was an irregular pattern of fluctuation during 4-6 and 12-15 weeks. Initial MC (mean) of 69% and 70%, had reduced to 46% and 50% in the experimental and control bins, respectively, at the end of 16 weeks. There was no significant difference ($p>0.05$) in the changes in the MC in experimental and control bins. A rapid increase in temperature in both types of bins was observed during the initial 3 - 4 weeks. The highest mean temperature recorded was 62 ^{0}C on the 25th day and 54 ^{0}C on the 14th day of experimental and control bins, respectively. The temperature of experimental bins showed a rapid increase after a turning and gradually decreased until the next turning. There was no significant difference ($p>0.05$) in the changes in the temperature in experimental and control bins. These results show, that manual turning has very little or no effect in increasing the rate of decomposition in household composting, even if it is turned on a weekly basis. The openings for natural aeration existing in household composting bins used in this experiment are adequate for aerobic decomposition.

Keywords: Aeration; Household composting; Manual turning; Volatile solids