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Evaluation of different types of commercially available domestic compost bins as an option for kitchen and garden waste management

N Liyanaarachchi, S Wijetunga* and K D N Weerasinghe
Department of Agricultural Engineering, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka

Composting is one way in which some of the problems associated with the utilization of various organic wastes can be resolved. Particularly in the urban area compost bins are being used for home composting, however, no any performance evaluation has been done with regard to different compost bins in Sri Lanka. The objectives of this research were to evaluate the different parameters in the composing process in different compost bins currently available in Sri Lanka, in order to find the comparatively most effective compost bin for kitchen waste. Four types of compost bins, namely, concrete box type (CB), plastic cylindrical shape (PC), plastic conical shape (PCO), and concrete cylindrical shape (CC) bins were used. Kitchen waste was used as main source of materials and garden waste was also used as a supplement. Parameters such as temperature, pH, electrical conductivity (EC), moisture content (MC), bulk density (BD), dry matter (DM), ash, Carbon: Nitrogen (C:N) ratio and volume reduction were measured for about 2 months. Highest temperature was reported from CB and PC (37 °C) during first week which was quite higher than ambient temperature (28.8 °C). Mature compost, dark brown in colour, moderately sticky, and no odor, were observed after 8 weeks of operation in CC. Moisture content of each type of bins were observed in the range of 50 % - 60 %. pH was reduced during the composting process, and it was close to pH 7 at maturity stage. Ash percentages at the maturity stage of compost were 8.15 %, 8.05 %, 9.10 % and 7.65 % in CB, PCO, PC and CC, respectively. At maturity the highest organic matter content (92.31 %) and Nitrogen content (1.06 %) were observed in CC and PCO, respectively with compared to other bins. Lowest C:N ratio (1:10.65) was observed in CC. Due to passive composting (no mixing of bulk) within the compost bin, the rate of decomposition was relatively low. According to the results, other parameters except C:N ratio, were shown relatively similar observations. However, since C:N ratio is vital factor in composting, CC can be recommended, compared with other types, for home composting of kitchen waste.

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*swije@ageng.ruh.ac.lk Tel: 041-2292200