Effects of aeration rate on degradation process of oil palm empty fruit bunch with kinetic-dynamic modeling

Abstract

The effect of different aeration rates on the organic matter (OM) degradation during the active phase of oil palm empty fruit bunch (EFB)-rabbit manure co-composting process under constant forced-aeration system has been studied. Four different aeration rates, 0.13Lmin-1kgDM-1,0.26Lmin-1kgDM-1,0.49Lmin-1kgDM-1 and 0.74Lmin-1kgDM-1 were applied. 0.26Lmin-1kgDM-1 provided enough oxygen level (10%) for the rest of composting period, showing 40.5% of OM reduction that is better than other aeration rates. A dynamic mathematical model describing OM degradation, based on the ratio between OM content and initial OM content with correction functions of moisture content, free air space, oxygen and temperature has been proposed.

Keyword: Oil palm empty fruit bunch (EFB); Degradation; Co-composting; Kinetic modeling; Aeration rate