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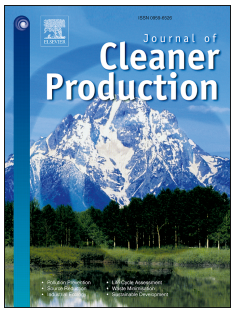

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Evolution of the composting process with semi-permeable film technology at industrial scale

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Abstract

This study evaluated the composting process of a mixture of sewage sludge and bulking agent in a semi-closed system at industrial scale, which consisted of an aerated static windrow covered with a semi-permeable film. Physical-chemical and respirometric variables were studied and bacteria and fungi were monitored to assess the improvement in the composting process. The system was compared with conventional open windrows in which lengthy composting times are required to obtain stabilized compost, compost sanitation is not always reached and periodical turning must be carried out to avoid anaerobic conditions. The high temperatures reached and maintained during the stage under the semi-permeable film (≈ 80ºC) permitted the sanitation of the compostable substrate, as demonstrated by the rapid disappearance of *Salmonella sp.* and the decrease in *E. coli* in only 5 days of the process. The total microorganism concentration also decreased during the composting process. The rapid decrease in carbon content expressed in volatile solids (VS) (around 41%) showed that the composting process carried out under the semi-permeable film could be shortened to 30 days. The evolution of thermophilic and mesophilic bacteria and fungi was conditioned by the windrow