

# Accepted Manuscript

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

Inmaculada González, Tatiana Robledo-Mahón, Gloria Andrea Silva-Castro, Alfonso Rodríguez-Calvo, M.Carmen Gutiérrez, M.Ángeles Martín, Arturo F. Chica, Concha Calvo

PII: S0959-6526(15)01857-0

DOI: [10.1016/j.jclepro.2015.12.033](https://doi.org/10.1016/j.jclepro.2015.12.033)

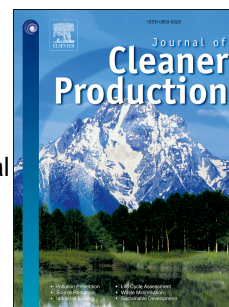
Reference: JCLP 6505

To appear in: *Journal of Cleaner Production*

Received Date: 18 May 2015

Revised Date: 26 October 2015

Accepted Date: 6 December 2015



Please cite this article as: González I, Robledo-Mahón T, Silva-Castro GA, Rodríguez-Calvo A, Gutiérrez MC, Martín MÁ, Chica AF, Calvo C, Evolution of the composting process with semi-permeable film technology at industrial scale, *Journal of Cleaner Production* (2016), doi: 10.1016/j.jclepro.2015.12.033.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

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

**Inmaculada González<sup>a</sup>, Tatiana Robledo-Mahón<sup>b</sup>, Gloria Andrea Silva-Castro<sup>b</sup>, Alfonso Rodríguez-Calvo<sup>b</sup>, M. Carmen Gutiérrez<sup>a</sup>, M. Ángeles Martín<sup>a\*</sup>, Arturo F. Chica<sup>a</sup> and Concha Calvo<sup>b</sup>**

a. University of Cordoba (Spain) – Department of Inorganic Chemical and Chemical Engineering. Campus Universitario de Rabanales. Carretera N-IV, km 396, Edificio Marie Curie, 14071 Córdoba, Spain. Phone: +34 957 218639; fax: +34 957 218625; e-mail: iq2masam@uco.es

b. Institute of Water Research, Department of Microbiology. University of Granada. C/ Ramón Cajal nº 4, 18071 Granada, Spain

**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 ( $\approx 80^{\circ}\text{C}$ ) 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

Download English Version:

<https://daneshyari.com/en/article/8102651>

Download Persian Version:

<https://daneshyari.com/article/8102651>

[Daneshyari.com](https://daneshyari.com)