

Accepted Manuscript

Phosphorus availability from the solid fraction of pig slurry is altered by composting or thermal treatment

Wibke Christel, Sander Bruun, Jakob Magid, Lars Stoumann Jensen

PII: S0960-8524(14)00995-X
DOI: <http://dx.doi.org/10.1016/j.biortech.2014.07.030>
Reference: BITE 13675

To appear in: *Bioresource Technology*

Received Date: 29 April 2014
Revised Date: 3 July 2014
Accepted Date: 4 July 2014

Please cite this article as: Christel, W., Bruun, S., Magid, J., Jensen, L.S., Phosphorus availability from the solid fraction of pig slurry is altered by composting or thermal treatment, *Bioresource Technology* (2014), doi: <http://dx.doi.org/10.1016/j.biortech.2014.07.030>

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.



**Phosphorus availability from the solid fraction of pig slurry is altered
by composting or thermal treatment**

Wibke Christel, Sander Bruun, Jakob Magid & Lars Stoumann Jensen*

Department for Plant and Environmental Sciences, University of Copenhagen,
Thorvaldsensvej 40, 1871 Frederiksberg C, Denmark

E-mail-addresses of all authors (in the same order as listed above):

wich@plen.ku.dk, sab@plen.ku.dk, jma@plen.ku.dk, lsj@plen.ku.dk

Abstract

The alteration of easily available phosphorus (P) from the separated solid fraction of pig slurry by composting and thermal processing (pyrolysis or combustion at 300-1000°C) was investigated by water and acidic extractions and the diffusive gradients in thin films (DGT) technique. Temporal changes in P availability were monitored by repeated DGT application in three amended temperate soils over 16 weeks. P availability was found to decrease in the order: drying > composting > pyrolysis > combustion with increasing degree of processing. Water extractions suggested that no P would be available after pyrolysis above 700°C or combustion above 400°C, respectively, but during soil incubation, even char and ash, processed at 800°C, increased P availability. Low-temperature pyrolysis vs. combustion was found to favor P availability as did application to acidic vs. neutral soil. Composting and thermal treatment produced a slow-release P fertilizer, with P availability being governed by abiotic and biotic mechanisms.

***corresponding author:**

Lars Stoumann Jensen; Department for Plant and Environmental Sciences, University of Copenhagen, Thorvaldsensvej 40, 1871 Frederiksberg C, Denmark; lsj@plen.ku.dk; +45 353 33470

Download English Version:

<https://daneshyari.com/en/article/680621>

Download Persian Version:

<https://daneshyari.com/article/680621>

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