Degradation of zearalenone and ochratoxin A in three Danish agricultural soils - DTU Orbit (12/01/2019)

Degradation of two mycotoxins: zearalenone (ZON) produced by species of Fusarium and ochratoxin A (OTA) produced by species of Penicillium were followed in pot experiments using agricultural topsoils from Danish experimental farms: a sandy soil, a sandy clay soil and a gyttja soil with a high content of silt. Experiments with unplanted soil and pots planted with barley were included. Soil samples were withdrawn during a period of 225 days and analysed for the content of OTA and ZON. The degradation of both toxins consisted of an initial fast degradation followed by a slower transformation step and was described well by a sum of two first-order kinetic equations. The decay first-order rate constants for the first step \(k(1)\) were in the range 0.73-2.91 d\(^{-1}\) for OTA and 0.0612-0.108 d\(^{-1}\) for ZON, respectively. Half-lives \(t(0.5)\) for ZON using data from the first phase were between 6.4 and 11 days, whereas the half-lives for OTA were about 0.2-1 day. The slowest degradation was measured in soil rich in clay. After 225 days, neither OTA nor ZON was detected in any of the soil types. Generally, the degradation of ZON and OTA was faster in planted soil than in unplanted soil, probably due to higher microbial activity. Due to the fast degradation of ZON and OTA in surface soil leaching as soluble substances appears to be limited. (c) 2005 Elsevier Ltd. All rights reserved.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Mortensen, G., Strobel, B., Hansen, H.
Pages: 1673-1680
Publication date: 2006
Peer-reviewed: Yes

Publication information
Journal: Chemosphere
Volume: 62
Issue number: 10
ISSN (Print): 0045-6535
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 4.62 SJR 1.435 SNIP 1.448
Web of Science (2017): Impact factor 4.427
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.39 SJR 1.447 SNIP 1.625
Web of Science (2016): Impact factor 4.208
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 4.04 SJR 1.497 SNIP 1.567
Web of Science (2015): Impact factor 3.698
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 3.76 SJR 1.59 SNIP 1.639
Web of Science (2014): Impact factor 3.34
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 3.92 SJR 1.721 SNIP 1.751
Web of Science (2013): Impact factor 3.499
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 3.5 SJR 1.794 SNIP 1.618
Web of Science (2012): Impact factor 3.137