



HAL
open science

Demonstration of the role of earthworms on the removal of highly compacted zones in field conditions

Yvan Capowiez, Pierre Bouchand, Stéphane S. Cadoux, Céline Pelosi, Jean Roger Estrade, Hubert H. Boizard

► To cite this version:

Yvan Capowiez, Pierre Bouchand, Stéphane S. Cadoux, Céline Pelosi, Jean Roger Estrade, et al.. Demonstration of the role of earthworms on the removal of highly compacted zones in field conditions. 8. International Symposium on Earthworm Ecology, Sep 2006, Cracovie, France. 1 p. hal-02821477

HAL Id: hal-02821477

<https://hal.inrae.fr/hal-02821477>

Submitted on 6 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

THE 8th INTERNATIONAL SYMPOSIUM ON EARTHWORM ECOLOGY

The Symposium will be held in Poland in [Kraków](#), at the [Jagiellonian University](#) at the [Institute of Environmental Sciences](#).

From 4th to 9th of September 2006

Title: Demonstration of the role of earthworms on the removal of highly compacted zones in field conditions

Authors: CAPOWIEZ Yvan(1), BOUCHAND Pierre(2), CADOUX Stéphane(2), PELOSI Céline(3), ROGER-ESTRADE Jean(3), BOIZARD Hubert(2)

Address: (1) INRA/UAPV Ecologie des Invertébrés- 84914 AVIGNON cedex 09- France

(2) INRA, Unité d'Agronomie Laon-Reims-Mons, Estrées-Mons, BP50136, 80203 Péronne, France

(3) UMR INRA-INAPG, Laboratoire d'Agronomie, BP 01, 78850 Thiverval-Grignon, France

Abstract:

By their excavation activities, earthworms are thought to contribute to the removal of highly compacted zones ("delta" zones) but the quantitative measurements of their impact is lacking. A first experiment was carried out in semi-field conditions (caging experiment). Adult earthworm from the most common species (*Lumbricus terrestris*, *Aporrectodea giardi*, *A. caliginosa* and *A. rosea*) were in presence of different compacted zones: (i) horizontal, (ii) vertical layer and (iii) isolated zone representing different natural situations (under wheel or tillage compaction). Depending on the species (and their behaviour) we observed different impacts on compacted zones (*L. terrestris* is more prone to cross horizontal layer whereas *A. caliginosa* is more prone to colonize vertical ones). A second experiment was carried out in field conditions to characterise the dynamics of the recolonisation by earthworms after a compaction (through a 8t vehicle). Under and between wheels zones were followed during 2 years. We studied earthworm bulk density, earthworm community, 2D vertical macroporosity and water infiltration measurements were done. We observed that earthworm recolonisation is a rapid process (less than 6 months to recover similar abundances) whereas macroporosity and water infiltration are much slower processes. This illustrates the difficulty of using earthworm abundance as way to estimate the physical consequences of earthworm activity. Moreover, 3D soil cores were collected at different dates under and between wheels and analysed through X-ray tomography. This enables us to visualize the (slow) recolonisation of the soil with earthworm macropores and to discuss the effect of the different species present in the field.

(oral communication)