



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

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# THE 8<sup>th</sup> INTERNATIONAL SYMPOSIUM ON EARTHWORM ECOLOGY

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

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## **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)