



## **Effects of soil tillage and management of crop residues on soil properties: abundance, biomass and diversity of earthworms, soil structure and nutrient evolutions**

Aboukacem lemtiri

Gembloux Agro-Bio Tech - University of Liège, B-5030 Gembloux, Belgium

The living soil is represented by soil biota that interacts with aboveground biota and with the abiotic environment, soil structure, soil reaction, organic matter, nutrient contents, etc. Maintenance of soil organic matter through integrated soil fertility management is an important issue to conciliate soil quality and agricultural productivity. Earthworms are key actors in soil structure formation through the production of casts and the incorporation of soil organic matter in the soil. Research is still needed about the interactive effects of various tillage and crop residue management practices on earthworm populations and physical and chemical properties of soil.

To investigate the impacts of two tillage management systems and two cropping systems on earthworm populations, soil structure evolution and nutrient dynamics, we carried out a three years study in an experimental field. The aims of this experimentation, were to assess the effects of the tillage systems (ploughing versus reduced tillage) and the availability of crop residues (export versus no export) on (i) the abundance, biomass and diversity of earthworms, on the soil structure and on the temporal variation of water extractable nutrients and organic carbon.

The first results show that tillage management did significantly affect earthworm abundance and biomass. However, crop residue management did not affect abundance, biomass and diversity of earthworms.

Regarding soil physical properties, the tillage affected the compaction profiles within the top 30cm. The analysis of nutrient and organic carbon dynamics show divergent trends (decrease of calcium and magnesium, increase of hot water extractable carbon and phosphorus...) but no clear effect of the studied factors could be identified. The question of the initial soil variability raised as a crucial point in the discussion.