

## **Earthworm populations and functional traits in a land-use gradient of annual, perennial and permanent grassland systems in a heterogenic agricultural landscape**

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Soil use is the key driving factor for the composition of the detritus food webs, for SOM quantity and quality, and related soil properties. Many studies have identified land-use change as a major driver affecting soil biodiversity, which severely influences soil functioning and the ecosystem services they deliver.

The overall intention of the study was to gain insights in future trends of soil ecology in a changing land-use towards bioenergy production. Therefor we investigated earthworm responses to different land-use intensities, such as rotational cropping with maize (1G), cultivation of perennial crops (2G), like Ssarvazi, Silphie, Igniscum and Miscanthus, and permanent grasslands at landscape scale in Western Germany. We analyzed species composition, individual numbers and biomass, and earthworm functional traits.

We can conclude that on average the investigated earthworm parameters of the newly introduced second generation bioenergy crops took a medium position between annual maize and permanent grassland sites. In addition, the experiments clearly emphasized that some results were in a clear trend, but others were site-depended and to some extend indifferent. We will critically discuss the ecological significance of perennial land-use systems from a soil biodiversity and soil functioning point of view.