The benefit of using terrestrial model ecosystems (TME) in environmental risk assessment

Soil is the basic compartment for living plants and organisms contributing to the biodiversity in our environment and for the production of food. The loss of natural soil fertility is a gradual, often neglected process which has occurred in the agricultural environment over the last decades. Soil organisms can be used as meaningful indicators to measure soil health. Impacts of PPP on the soil community can be diverse and are difficult to forecast due to the high diversity and the complex networks of species and interactions found within the soil. The investigation of PPP impacts on soil communities is possible with higher-tier methods such as terrestrial model ecosystems (TME). TMEs capture natural soil communities (e.g. collembolans, oribatid mites, enchytraeids, earthworms) under realistic environmental conditions and study design, as well as test conditions, can be adapted to investigate specific issues (e.g. specific soil type, high humidity, drought etc.). Moreover, it is possible to test different exposure scenarios e.g. mixtures and series of applications. Both the concentration of PPP and the exposure of species can be measured in space and time and can be related to effect patterns observed on the species and community level. Some exemplary results will be highlighted and the benefits of using TME in ecological risk assessment will be demonstrated.