



## **Indicating resilience and sustainability in arable soil systems across Europe. Response of soil microbial biomass to tillage reductions in four European countries**

Ilka Schmoock, Deborah Linsler, and Martin Potthoff

University of Göttingen, Centre of Biodiversity and Sustainable Land Use (CBL), Germany  
(ilka.schmoock@stud.uni-goettingen.de)

Soil microorganisms provide essential soil functions like mineralization and pathogen suppression as ecosystem services in agricultural soils. The soil microbial biomass (SMB) can be taken as an effective indicator for the microbial status of soils and its response to agricultural practices and measures. The European Biodiversa ERA-NET project SoilMan investigates the provision and the management of ecosystem services (EES) of soil organisms. Here we present as one of the first project outcomes SMB responses to tillage reductions in Spain, France, Sweden, Romania, and Germany and different crop rotations in France. Soil samplings were taken in May and June 2017 from long-term experimental field-sites at three different depths: 0 to 10 cm and 10 to 20 cm and 20 to 30 cm. SMB was determined by Chloroform-Fumigation-Extraction (CFE). Depending on soil characteristics the general level of SMB was low in France (about  $100 \mu\text{g g}^{-1}$ ) and high in Germany (up to  $350 \mu\text{g g}^{-1}$ ). Due to the mixing effect of tillage the tilled plots showed mostly reduced SMB in the upper active layer and higher SMB in the two lower layers compared to reduced tillage treatments. However, a crop rotation with six years of pasture instead of permanent annual crops, increases SMB in all layers throughout the profile. We conclude that SMB and related ESS are generally supported by reductions in tillage intensity in all biogeographical regions covered by SoilMan.