

## **Carbon sequestration, roots and amendments**

**Involved projects:** MIXROOT-C, MaxRoot C

Climate change mitigation and adaptation is a major challenge of modern agriculture. Increasing the incorporation of atmospheric carbon (C) as organic matter into soils through improved crop management seems to be a promising agricultural management option for supporting climate change mitigation. In order to build up soil organic C increased organic C inputs to the soil are urgently needed. In agricultural soils, crop roots are the major source of C inputs and pivotal for long-term C storage compared to aboveground biomass as their turnover is 2 to 3 times slower. Thus, sequestering carbon in soils through increased belowground C inputs from cropping systems, specifically increasing root carbon inputs could play a major role in mitigating climate change. The most viable yet to date neglected option to increase root carbon inputs is an increased and deeper root production of both main and cover crops in extensive and intensive cropping systems.

In MIX and MaxRoot-C we are developing assessment methods to estimate root C inputs of both staple and novel crops in cropland, grassland and agroforestry systems across Europe. In this session we seek contributions which cover topics such as: measuring root traits, root biomass, root stoichiometry, root architecture, isotope labelling and rhizodeposition, in conjunction with environmental factors, such as soil type, strength and fertility, to predict the effect of root systems on SOC stocks. We would also like to see results from the ongoing projects that might be of interest to the root community and the initial data or approaches from those working on modelling. In this session we hope to go beyond current knowledge, to evaluate the potential impact of promising C sequestering management interventions, such as: cover cropping, targeted breeding, and soil management in these diverse agricultural production systems aiming at widespread adoption of more sustainable carbon sequestering and soil restorative practices.