



Improved soil functioning through diversified soil management in Swedish climates

Due to climate change, we are experiencing increased temperatures and higher frequency and magnitude of extreme weather events, which challenge crop production. To sustain high and stable crop yields in the future, crop and soil management have to be adapted to the changing climatic conditions. Strategies to adapt to climate change could include for instance the change of crops, breeding, diversified crop rotations and improved soil quality. Due to differences in agro-climatic conditions across Sweden, climate change may also have different impacts and require different adaptations in different areas. In this PhD, I want to study the potential of diversified cropping systems and management of arable soil to enhance soil functioning and productivity in the context of climate variations across Sweden.

My PhD consists of three parts in which I will use different methodological approaches and spatial and temporal scales. In the first part, I am working on the national level and including all counties in Sweden with data from the last five decades, where I will for example study the temporal and spatial changes in crop diversity and relate crop yields to weather variability and soil texture. In the second part, I will collect on-farm data at the field level and quantify relationships between soil management, soil health and crop yield from farms in two areas in Sweden. The third part will include field sampling from two different long-term field experiments to analyse the long-term effects of cover crops (vs no cover crops) on soil functions with a focus on crop productivity and carbon storage.