



## **Regional crop productivity and greenhouse gas emissions from Swiss soils under organic farming**

Juhwan Lee, Magdalena Necpalova, and Johan Six

ETH Zurich, Agricultural Sciences, Environmental Systems Science, Zurich, Switzerland (juhwan.lee@usys.ethz.ch)

There is worldwide concern about the increase in atmospheric greenhouse gases (GHG) and their impact on climate change and food security. As a sustainable alternative, organic cropping in various forms has been promoted to minimize the environmental impacts of conventional practices. However, relatively little is known about the potential to reduce GHG emissions while maintaining crop productivity through the large-scale adoption of organic practices. Therefore, we simulated and compared regional crop production, soil organic carbon status, and net soil GHG emissions under organic and conventional practices. Grid-level (2.2 km by 2.2 km) simulation was performed using previously validated DailyDayCent by considering typical crop rotations. Regional model estimates are presented and discussed specifically with the focus on Swiss organic and conventional cropping systems, which differ by type and intensity of manuring, tillage, and cover crop.