Media release of 21 June 2017

Tillage without using a plough: beneficial for soil and climate

Ploughless tillage can reduce soil erosion and contribute to protecting the climate. Two recent publications by the Research Institute of Organic Agriculture (FiBL) on reduced tillage support this thesis.

(Frick, 21 June 2017) Positive effects on soil and climate can ensue when an organic farmer stops working with a plough. A FiBL trial gained these insights in clayey soils in Frick, Switzerland. Over the course of 13 years, about 8 % more humus formed in the soils tilled with a cultivator and skim plough compared to soil cultivation with a plough. In other words, reduced tillage sequestrates 2.3 tonnes of CO₂ equivalents per ha more in a year than cultivation with a plough.

Farmland resembles a natural meadow

A plough mixes humus about 20 cm deep into the topsoil. In a reduced tillage system, however, more humus builds up in the topmost 10 cm. Below that threshold, the humus content remains stable or decreases. Thus, the distribution of humus in a reduced tillage system is closer to a meadow than a field. This can prevent soil erosion and increase the presence and variety of microorganisms like bacteria and fungi.

Greenhouse gases: Timing is more important than type of soil cultivation

Neither one of the examined crops grass-clover and winter wheat showed a difference in nitrous oxide emitted from the two systems. Methane emissions are at the same low level. However, the weather conditions have a huge influence. Tilling wet soils, whether performed with a plough or a cultivator, is not only ill advised for reasons of soil protection, but also due to the high nitrous oxide emissions.
Information on reduced tillage

For farmers:
http://www.bioaktuell.ch/pflanzenbau/ackerbau/bodenbearbeitung.html

For researchers:

Publications and articles

Available at: http://orgprints.org/31286/

Available at: http://orgprints.org/31140/

Available at: http://agrarforschungschweiz.ch/artikel/2017_06_2285.pdf

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Funding

Coop Sustainability Fund
Federal Office for Agriculture (FOAG) within the framework of a CORE Organic II project
Swiss National Science Foundation (SNF) within the framework of NRP 68
Federal Office for the Environment (FOEN)

Partners

University of Hohenheim
University of Tübingen

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