

Publication**Reduced tillage in temperate organic farming: implications for crop management and forage production****JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 487819**Author(s)** Krauss, M.; Berner, A.; Burger, D.; Wiemken, A.; Niggli, U.; Maeder, P.**Author(s) at UniBasel** [Wiemken, Andres M.](#) ;**Year** 2010**Title** Reduced tillage in temperate organic farming: implications for crop management and forage production**Journal** Soil Use and Management**Volume** 26**Number** 1**Pages / Article-Number** 12-20**Keywords** Crop rotation, grass-clover, ley removal, organic farming, reduced tillage, silage maize

To promote conservation tillage in organic farming systems, weed control and ley removal within arable-ley rotations need to be optimized. A long-term field trial was thus established in Frick, Switzerland in 2002 on a clayey soil and with a mean precipitation of 1000 mm/year. The tillage experiment distinguished between conventional tillage with mouldboard ploughing (CT, 15 cm depth) and reduced tillage (RT), including a chisel plough (15 cm) and a stubble cleaner (5 cm). Results of a 2-year grass-clover ley (2006/2007) and silage maize (2008) are presented. Due to dry conditions, mean grass-clover yields were 25% higher in RT than in CT, indicating better water retention of RT soils. Clover cover and mineral contents of the fodder mixture were also higher in RT. The ley was successfully removed in autumn 2007 in RT plots, and a winter pea catch crop was sown before maize. In CT, ploughing took place in spring 2008. Maize yields were 34% higher in RT than in CT, despite a two- to three-fold higher but still tolerable weed infestation. Maize in RT plots benefited from an additional 61.5 kg of easily decomposable organic N/ha incorporated into the soil via the pea mulch. Measurement of arbuscular mycorrhizal colonization of maize roots indicated a similar mechanical disturbance of the topsoil through the reduced ley removal system compared with ploughing. It is suggested that RT is applicable in organic farming, even in arable-ley rotations, but long-term effects need further assessment.

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