



Conventional and conservation tillage from pedological and ecological aspects, the SOWAP project

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According to our understanding conventional agriculture is based on tillage and it is highly mechanised. Conventional agriculture causes severe land degradation problems including soil erosion and pollution as well as other environmental damages like biodiversity and wildlife reduction, low energy efficiency and a contribution to global warming (Boatman et al. 1999).

According to the SOWAP project (Soil and Surface Water Protection Using Conservation Tillage in Northern and Central Europe, 2003) definition *Conservation Tillage (CT)* is understood as tillage practices specifically intended to reduce soil disturbance during seedbed preparation. The objective being to improve soil structure and stability. Conservation tillage encompasses a range of tillage practices up to and including „Zero (no) Tillage”.

Conservation Agriculture (CA) is a holistic approach to crop production, which encompasses „Conservation Tillage”, and also seeks to preserve biodiversity in terms of both flora and fauna. Activities such as Integrated Crop, Weed, and Pest Management form part of Conservation Agriculture. The concept of „As little as possible, as much as is needed” will be the guiding principles for SOWAP in crop production, when it comes to chemical usage.

Recognising the benefits of CA a demonstration project started in 2003, supported by the EU LIFE Programme and by Syngenta.

SOWAP (SOil and WAtER Protection) aims to assess the viability of a more “conservation-oriented” agriculture, where fewer tillage practices replace the numerous cultivations carried out under more “conventional” arable farming systems. The

use of appropriate chemicals is tested, and their potential for off-site contamination assessed, to ensure that any suggested approaches are environmentally sound.

The main study topics of the project are as follows: (1) soil erosion, (2) aquatic ecology, (3) biodiversity, (4) soil microbiology, (5) agronomy and (6) economics.

The project started on study sites in Belgium, Hungary and U.K. In Hungary two sites were selected near Lake Balaton, in the vicinity of Keszthely. For the soil erosion survey 4 plots were installed at Szentgyörgyvár (2 conventionally tilled, 2 minimum tilled), each 50 x 24 m in size. For the terrestrial ecology survey 24 plots (12 conventionally tilled, 12 minimum tilled, each between 3-5 ha in size, in total 107 ha) were selected. The ecological survey includes the survey of weeds, soil microorganisms, birds and earthworms-insects-seeds as important food sources for birds.

Our preliminary results show that there is a significant difference between runoff, earthworm activity and foraging farmland bird numbers on the two differently managed plot types and therefore Conservation Agriculture has significant advantages for the soil itself and for the environment.