

CONSERVATION AGRICULTURE AS A TOOL AGAINST SOIL DEGRADATION AND FOR IMPROVING BIODIVERSITY

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A considerable part of the Earth is used by agriculture. The share of agricultural area in the world is 37.3 % and in Europe it is 43.6 %, therefore it is extremely important that agricultural areas are treated in the best possible way from the aspect of the environment and nature. It has been proved lately that conservation agriculture is such a tool. *Conventional agriculture* is based on tillage and it is highly mechanised. It leads to 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. *Conservation Agriculture (CA)* encompasses conservation tillage and also seeks to preserve biodiversity in terms of both flora and fauna. *Conservation Tillage (CT)* is understood as tillage practices specifically intended to reduce soil disturbance in order to improve soil structure and stability. Conservation tillage encompasses a range of tillage practices up to and including zero (no) tillage.

Conservation agriculture is beneficial for the soil by conserving it more or less in semi-natural conditions. The environmental benefits of CA include on-site and off-site effects, the latter having local, regional or global importance. CA reduces CO₂ and SO₂ emissions and promotes carbon sequestration in soils. Concerning global biodiversity, CA offers better nesting sites and better food supplies. CA fields host higher bird, small mammals and game population and it is beneficial for soil biodiversity. Soil moisture conditions are much better, than under conventional agriculture. Better water management of the soil is manifested in reduced runoff. Soil loss by erosion is also considerably reduced.

The above statements are demonstrated by the results of the SOWAP (SOil and WATER Protection) project (2003–2007), supported by EU LIFE and Syngenta. The project started on study sites in Belgium, Hungary and U.K. The paper presents the results of the Hungarian study sites including plots for soil erosion and biodiversity measurements. According to our results conservation tillage techniques have reduced soil loss and water run-off from fields compared to ploughing. The amount of nutrient loss is also reduced. Soil loss due to rill erosion as well as the number of rills is remarkably less. Soil moisture conditions are much better under conservation tillage. Rainfall simulation experiments point first of all to the protecting effect of plant residues under conservation tillage.

Yields of winter wheat, winter oilseed rape, sugar beet and maize are similar from both ploughed and conservation-tilled fields. Biodiversity conditions are much better on the conservation plots.

CA compared with conventional has significant advantages both for the soil itself and for the environment and it can be highly recommended also in hilly and mountainous regions where agricultural activity is carried out.