



COST 634 workshop

# Farm level adoption of SWC measures and policy implications in Europe

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## Scientific Report

Editors

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## Appendix 1 Abstracts of keynotes

### Keynote 1. Potential of Conservation Agriculture for Conserving Soil and Water in Europe

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Conservation agriculture appeared historically as a response to soil erosion crises in USA, Brazil, Argentina and Australia where, currently, it spans over million hectares. The most famous success story is that of Brazil, where conservation agriculture has been initiated by farmers. Afterwards, research, policy, NGOs, public and private sectors joined their efforts to farmers and farmers' societies and networks which led to effective and dynamic innovation systems that have strongly contributed to disseminate the technology.

According to KASSA findings, conservation agriculture is less adopted in Europe and, reduced tillage is more common than no-tillage and cover crops; it is not popularised and it is less researched. The lack of knowledge on conservation agriculture systems and their management and, the absence of dynamic and effective innovation systems make it difficult for farmers to give up ploughing which is a paradigm rooted in their socio-cultural backgrounds. In Norway and Germany the adoption of conservation agriculture has been encouraged and subsidised in order to mitigate soil erosion. In the other European countries (France, Czech Republic, Ukraine, Spain) the adoption process is mainly farmers driven and the major driving force has been the cost reduction in machinery, fuel and labour saving. Time saving and the flexibility and improved timeliness in field operations allowed farmers in Spain, as in Brazil, to develop other agricultural or non-agricultural activities generating additional benefits. Soil and water conservation concerns did not appear as main drivers in the European farmers' decision to shift or not to conservation agriculture. After years of conservation agriculture practice, Spanish farmers perceive the effectiveness of conservation agriculture systems in reducing soil erosion and improving water productivity which reinforce their choice.

Conservation agriculture is not equally appropriate for all the agroecosystems. The development of conservation agriculture systems and their socio-economic and ecological sustainability are highly site specific. They depend on biophysical factors, socio-cultural and technological conditions as well as market, institutional and policy environments. Efficient conservation agriculture systems combine four practices: (i)- reduced tillage or no-tillage and (ii)- direct seeding for fewer disturbances of the soil and proper crop establishment; (iii)- cover crops to mitigate soil erosion and to improve soil fertility and functions and; (iv)- crop rotation to combat weeds, pests and diseases. Their development and fine tuning require a continual adjustment which calls for continual knowledge generation and sharing among the stakeholders within the innovation systems. In Europe, the use of cover crop and crop rotations is still hardly practiced due to climate and soil limitations, short length of growing period in northern latitudes, lack of adapted crop varieties, difficult management of crop residue in wet and dry conditions and, general market conditions. Farmers do not use cover crops and rotations when they do not generate direct economic benefit. As a result, the conservation agriculture is still relying mostly on the use of chemicals for the control of weed,

pests and diseases whose impact on the environment, soil, water, and health are less documented. Reducing soil erosion through increasing the use of pesticides is seen as a conflicting goal in Norway.

The conversion of European farmers to conservation agriculture is being achieved through a step by step attitude; and large scale farms are the most adopters, probably due to their ability to absorb the risk. The short term socio-economic benefits that conservation agriculture provides, the need to improve farms' competitiveness, market globalization and the steady increase of fuel cost... are likely to be sufficient to boost the ongoing slow adoption trend of conservation agriculture in Europe and to overcome the farmers' possible reluctance or socio-cultural barriers. Hence, the need of soil and water conservation in Europe requires anticipating the ongoing process in order to improve its ecological sustainability. Priorities would be: (i)- to define the recommendation domains for conservation agriculture within Europe taking into account climate and soil constraints, length of growing period; water availability and quality; erosion hazards and, farming conditions; (ii)- to encourage the use of cover crops and agronomically sound crop rotations as management strategies for weed, pest and diseases.