

Conservation Agriculture for Climate Change Mitigation

Highlights from the Learning Event, September 2012

Conservation agriculture is as an approach to farming that seeks to increase food security, alleviate poverty, conserve biodiversity and safeguard ecosystem services. Conservation agriculture practices can also contribute to making agricultural systems more resilient to climate change. In many cases, conservation agriculture has been proven to reduce farming systems' greenhouse gas emissions and enhance their role as carbon sinks. The figure below outlines the three pillars of conservation agriculture:

FAO: 3 Pillars of Conservation Agriculture		
Continuous minimum mechanical soil disturbance by reducing tillage	Permanent organic soil cover	Diversification of crop species grown in sequences or associations

The learning event on conservation agriculture for climate change mitigation in September 2012 was the first of a series of events undertaken by the [Community of Practice for Climate Change and Mitigation in Agriculture](#). The event hosted eight webinar sessions with five expert speakers and nearly 50 participants interested in climate-smart agriculture.

Highlights of the learning event

- Factors that influence soil carbon sequestration are: climatic conditions, temperature, soil moisture and pH, soil type and texture, previous land use, rotation pattern and soil disturbance (e.g. tillage).
- A case study on Zambia by Samuel Bells showed that combining conservation agriculture with tree cultivation increases crop yields by 240–400 percent, enhances soil carbon sequestration and improves resilience to climate shocks. In addition, the biomass that is produced can be used for feeding livestock.
- In Mexico, a study carried out by the International Maize and Wheat Improvement Center (CYMMIT) compared two different cropping systems and found that conservation agriculture produced the highest yield in both environments. In most cases, soil organic carbon increased with conservation agriculture, while in others it remained the same. However, it was demonstrated that combining zero tillage with the removal or burning of cover crops was an unsustainable approach that did not improve yields nor increase soil carbon. It is vital to combine all three 'pillars' of conservation agriculture to make conservation agriculture systems sustainable. Conservation agriculture also needs to make economic sense for the farmer.
- Suitable mechanization solutions already exist for climate-smart agriculture practices and different cropping systems, but more emphasis needs to be put into making the machinery available at an affordable price.



Photo: Theodor Friedrich

Webinar recordings of the learning event

- [Organic carbon accumulation and GHG emission reductions](#)
Sandra Corsi (FAO)
- [Mexico: Mitigating and adapting to climate change using conservation agriculture](#)
Bram Govaerts (CIMMYT)
- [Zambia: Trees and conservation agriculture in arid areas](#)
Samuel Bell (Cornell University, Share Value Africa, Ltd.)
- [Cameroon: Conservation agriculture and climate change issues in dryland areas](#)
Oumarou Balarabé (CIRAD)
- [Conservation agriculture and mechanization for a climate-smart approach](#)
Theodor Friedrich (FAO)

- Avoiding soil compaction reduces water run-off, increases aeration of the soils, and helps increase the soil carbon. Reducing heavy machinery use also lessens the use of fossil fuels and lowers on-farm emissions.
- Some barriers that hinder the implementation of conservation agriculture include:
 - cultural factors (farming traditions, prejudice);
 - lack of know-how about how to implement conservation agriculture (e.g. different methods for controlling weeds and managing residues);
 - competitive uses of crop residues and lack of negotiation between competing users;
 - limited knowledge of integrated weed management practices without herbicides;
 - the lack of adequate equipment; and
 - the lack of supportive policies and adequate networks for distribution of machinery.

Comments

"In my experience conservation agriculture always has economic benefits for all farmers (big and/or small) but adoption is not easy." - Member, Argentina

"Conservation agriculture as a way to mitigate climate change is just one aspect of climate change mitigation in agriculture." - Member, Denmark

"Livestock and conservation agriculture: Farmers in dry areas where the grazing is communal find it very difficult to maintain adequate soil organic cover. I think we need to come up with parallel livestock programmes to improve the quality of conservation agriculture, mainly through the introduction of agroforestry species for fodder!" – Member, Canada

"Soil tillage is a very energy consuming process that releases large amounts of CO₂ from fossil fuels and from the oxidative breakdown of soil organic matter."

S.Corsi/FAO

"I have particularly liked the participatory engagement of the community for climate change mitigation in agriculture in deciding what they should learn. That is great!" - Member, Malawi

Links to recordings of the presentations: www.fao.org/climatechange/micca/79527

Further Information

- LinkedIn group of the community of practice: [tinyurl.com/8ufs9o3](https://www.linkedin.com/groups/8489992)
- Form to join the community: bit.ly/X0Ye06
- **Save and Grow**: A policymaker's guide to the Sustainable Intensification of smallholder crop production bit.ly/TeK1br
- The MICCA Programme: www.fao.org/climatechange/micca

Comments or questions?

Contact the Mitigation in Climate Change of Agriculture team: micca@fao.org

The Community of Practice has been initiated as part of activities by FAO's Mitigation of Climate Change in Agriculture (MICCA) Programme. The team thanks all members and expert speakers for active participation! We welcome also any further [comments and feedback!](#)