ECAF
European Conservation Agriculture Federation

Conservation Agriculture: The role of Academia in its technology transfer

Gottlieb Basch

EUROPE -

The developing continent regarding Conservation Agriculture

Gottlieb Basch

Contents

- Who is ECAF
- CA in Europe
- "Constraints" for the uptake of CA
- Assumptions
- Technology transfer in agriculture
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Who are we?

Federation of European National Associations promoting Conservation Agriculture

Non-Profit association founded in 1999

Based in Brussels

ECAF

- 15 European National Associations
- Broad membership with practical focus.
- Multidisciplinary Experts and Specialists
- From Academia, Researchers, Technicians
- Advisors, Consultants and Administrators
- Practising farmers – innovative
- Local and Europe- SMEs and multinational companies and members of the agricultural industry.

Our objectives

- To promote the concept of Conservation Agriculture throughout Europe
- To be the European platform for exchange of information and experience on Conservation Agriculture
- To establish the framework for sustainable agriculture

Why?

- Changes in the demands of land use and farming
- Drawbacks of traditional farming practices (environmental, economic, agronomic)
- Conservation Agriculture matches the demands of a sustainable agriculture

"CA" adoption in some European countries

Commercial uptake of no-till in some Western European countries in 2007–2008, together with the proportion of the total arable area allocated to no-till. For sources see references cited in footnotes.

Country	Area of no-till[a] (kha)	Total arable land (2008)[b] (kha)	Area of no-till as % of total arable area
Finland[c]	200	2256	8.86
Germany[c]	5	11933	0.42
France[c]	200	18260	1.09
Switzerland[c]	12.5	408	3.06
Spain[c]	650	12500	5.20
Portugal[d]	80	1050	7.62
Italy[d]	80	7132	1.12
Slovak Rep.[d]	37	1382	2.68

[a] Excluding orchard and tree crops.
[b] FAO Statistics Division 2010 (www.fao.com).
[c] Derpsch and Friedrich (2009).
[d] Basch et al. (2008).

Soane et al. 2012

Constraints for adoption: Europe

- *Cultural entrenchment of traditional tillage methods*
- *Favourable natural conditions in many regions*
- *Agriculture guided by Common Agricultural Policy*
- *Low economic pressure*
- *Crop residue management*
- *Lack of condition specific drilling equipment*
- *Lack of problem oriented research*
- *and many others*

Basch (2005)

Meena & Singh (2008)
2

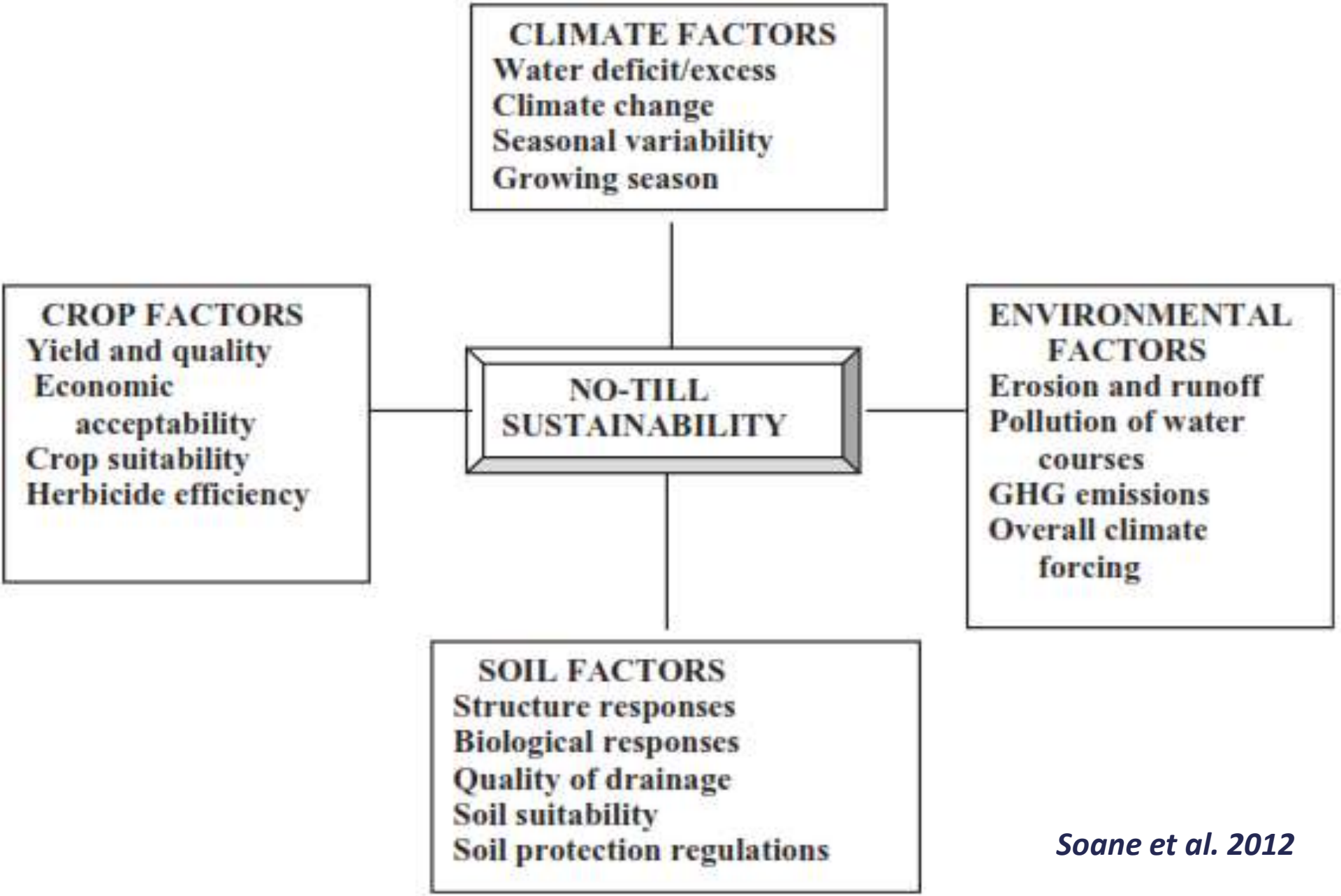
Table 2 : Prevailing Constraints in Adoption of CA Innovations	
Author (s)	Singh & Kumar (2005), Kumar *et al.* (2005), Singh *et al.* (2005), Singh (2005), Singh *et al.* (2005), Singh & Pandey (2005), Sinha & Singh (2005), Singh *et al.*, (2006).
Constraints	
Technical	• Non-availability of quality drill • Lack of regular monitoring of machines • Lack of training/ capacity building • Spare parts are not available locally • Lack of local manufacturers of machines
Extension	• Lack of extension support from state extension agencies • Lack of extension literature • Lack of attention by mass media • Lack of knowledge of extension agencies • Inadequate extension facility at disposal of input agencies • Lack of cooperation from fellow farmers
Financial	• Lack of credit facilities • Lack of money to buy new machines and inputs • No subsidy on machines • High cost of drill

Constraints for adoption: Africa

- Highly degraded soils,
- Pests and weeds;
- Mindset, lack of awareness and improper knowledge;
- Capital constraints and the need for external drive;
- Insecure land tenure;
- Inadequate cover crop - Livestock factor;
- Insufficient enabling policy environment to boost sustainable land management and scale up success stories of projects and community's efforts;
- Weak capacities at institutional, community and various stakeholders levels;
- Insufficient partnership and investments in CA.

Thiombiano and Meshack (2009)

Suitability factors for uptake of CA

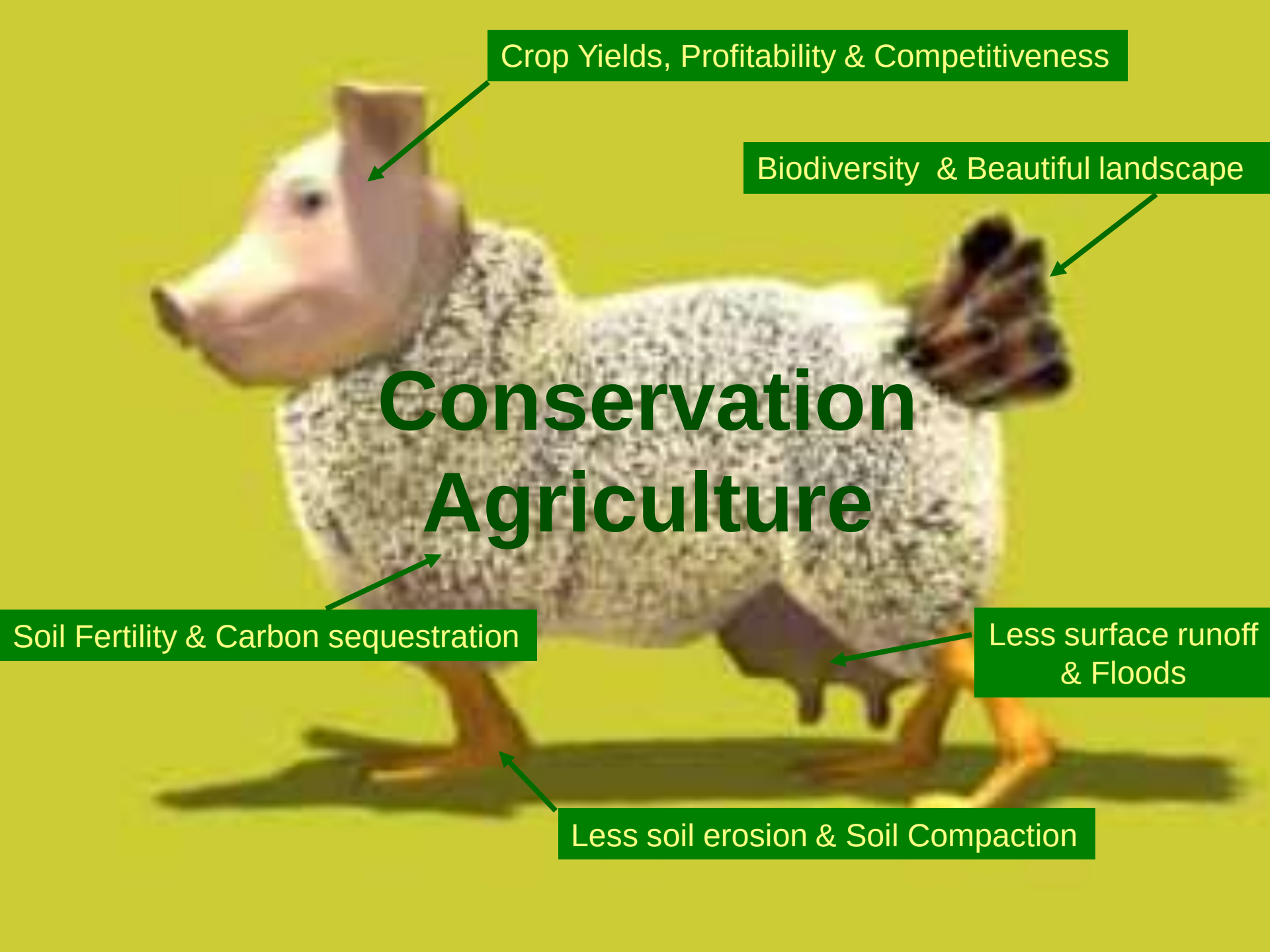


Soane et al. 2012

Assumptions

CA does work in all agro-ecologies

CA is the most promising approach towards sustainable production intensification


Crop Yields, Profitability & Competitiveness
Biodiversity & Beautiful landscape
Conservation Agriculture
Soil Fertility & Carbon sequestration
Less surface runoff & Floods
Less soil erosion & Soil Compaction

So, we are looking for SUSTAINABILITY,

but remember:

Sustainability is a journey, not a destiny

Technology Transfer

Which approach?

What is necessary to make CA work?

- **Knowledge/Technology generation**

i.e. adapt CA technology to site-specific conditions

- Crops and their rotation, establishment technology
- Cover crops
- Residue management
- Weeding, fertilization, etc.

➢ Knowledge/Technology communication

i.e. creating a CA message

- Involvement of all stakeholders

Farmers

Extensionists

Local authorities

Agri-business

“Scientists/researchers”

What does it need to have the principles of CA accepted and adopted?

- **Knowledge/Technology utilization**

- Any approach must include:

- The respect for social, economic, cultural restrictions
- Farmer centered participatory technology development
- Network of pioneer farmers

Potential role of farmers in TT process

* Collaborate with extension research and agribusiness stakeholders
* Practice autonomous decision making and actively participate in setting experimental objectives and defining standards for technology and agricultural management
* Communicate knowledge of useful technologies from one farmer to another (farmer dominated study groups, network of reference farmers)
* Address experienced problems to the other stakeholder groups

Role of Extension, Research, NGOs (professionals, scientists, etc.) in TT

* Create problem awareness and CA message dissemination
* Obtain information from farmers' behaviours and redirect decision making to provide farmers with information to enable them to make their own analyses and decisions (set experimental objectives define standards for crop management)
* Reevaluate current technologies to incorporate farmers priorities and "practical knowledge" alongside "scientific knowledge"
* Scientists learning from, and understanding farmers, their resources, needs and problems to then incorporate conservation agriculture technologies (farmer participatory adaptive research)
* Farmer training and farmer field schools

Role of Agribusiness in TT

* Develop good relationships to collaborate with extension research and link with farmer groups
* Support farmers through technical assistance, training, small grants to invest in infrastructure, and loans to purchase inputs
* Provide services such as market information, intelligence and promotion
* Partnership with farmers through production contracts and exchanging agricultural inputs and services for assured deliveries of produce

Role of Government (policy, decision-makers) in TT

* Promote the partnership of farmers to work with extension research and agribusiness to encourage sustainable development and progress
* Provide improved access to credit and loans
* Introduce/promote programs to encourage the adoption of conservation practices, specifically minimum (conservation) tillage
* Promote technical capacity at institutional level to mainstream the adoption of CA
* State subsidy programs (seeds, inputs, technology)

The role of academia

Knowledge/Technology Generation & Communication

CONSERVATION AGRICULTURE (CA) IN SOUTHERN AFRICA: LONGER TERM TRENDS IN SOIL QUALITY AND CROP PRODUCTIVITY

By Christian Thierfelder and Isaiah Nyagumbo

In collaboration with:
Amos Ngwira, Ivy Ligowe, Sebastiao Famba, Ivan Cuvaca, Mwangala Sitali, Tobias Charakupa, Herbert Chipara and Sign Phiri

Conclusions

- CA offers many opportunities for farmers in southern Africa
- Results from LT trials show:
  - higher infiltration,
  - lower soil erosion,
  - higher soil moisture,
  - Increased carbon and aggregate stability
  - Higher crop performance in the longer term
- Benefits of CA emerge over time
- Rotations play a significant role in CA cropping systems

Conclusions

Promoting CA in southern Africa has challenges:

- Residue retention
- Rotations
- Weed control
- Mindset

More socio-economic and biophysical studies are needed to understand and overcome those challenges

The CA trials are the only source of scientific longer term data in southern Africa…..

…..they need to be supported (financially) and used effectively (by science)……!

Smallholder conservation agriculture

Rationale for IFAD involvement and relevance to the East and Southern Africa region

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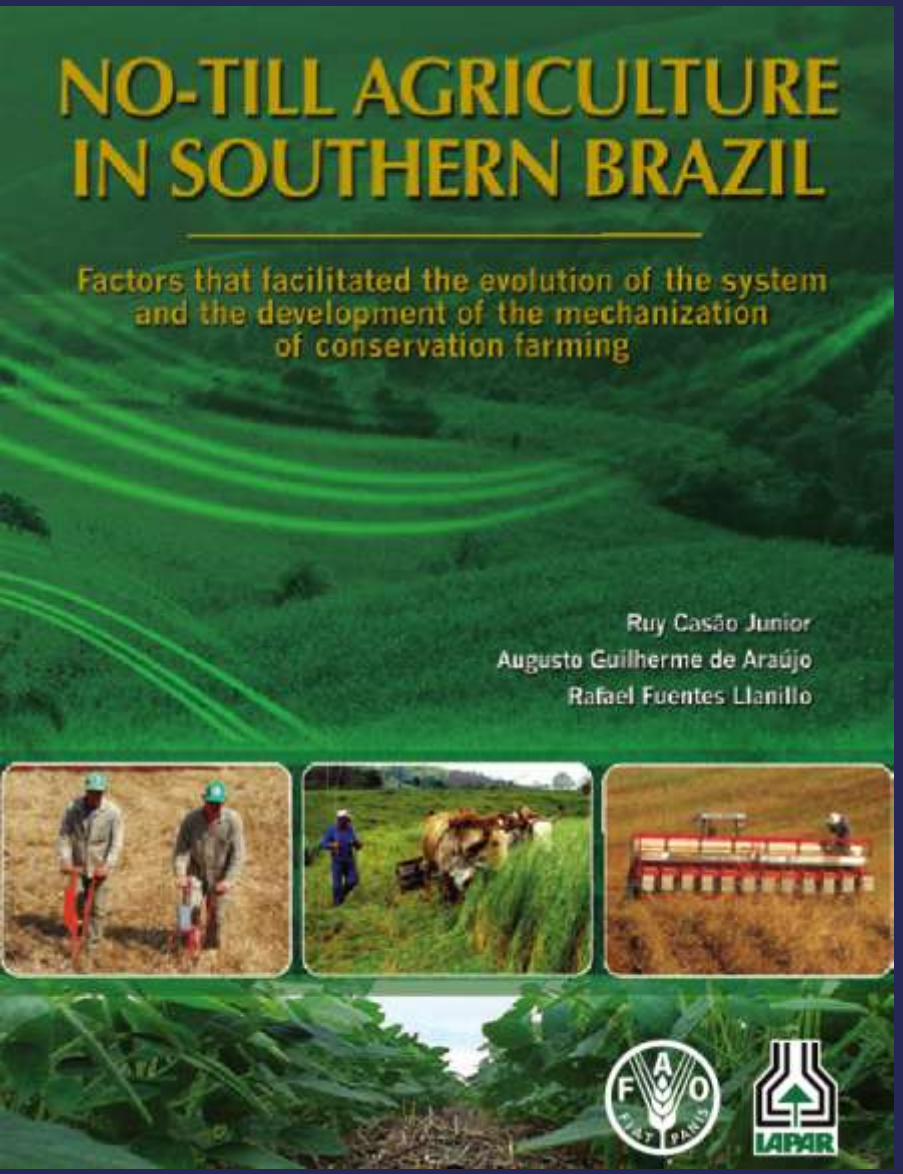

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Conservation Agriculture and Sustainable Crop Intensification in Karatu District, Tanzania

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[5]Ministry of Agriculture, Food Security and Cooperatives, Dar-es-Salaam, United Republic of Tanzania

[6]African Conservation Tillage (ACT) Network, Nairobi, Kenya

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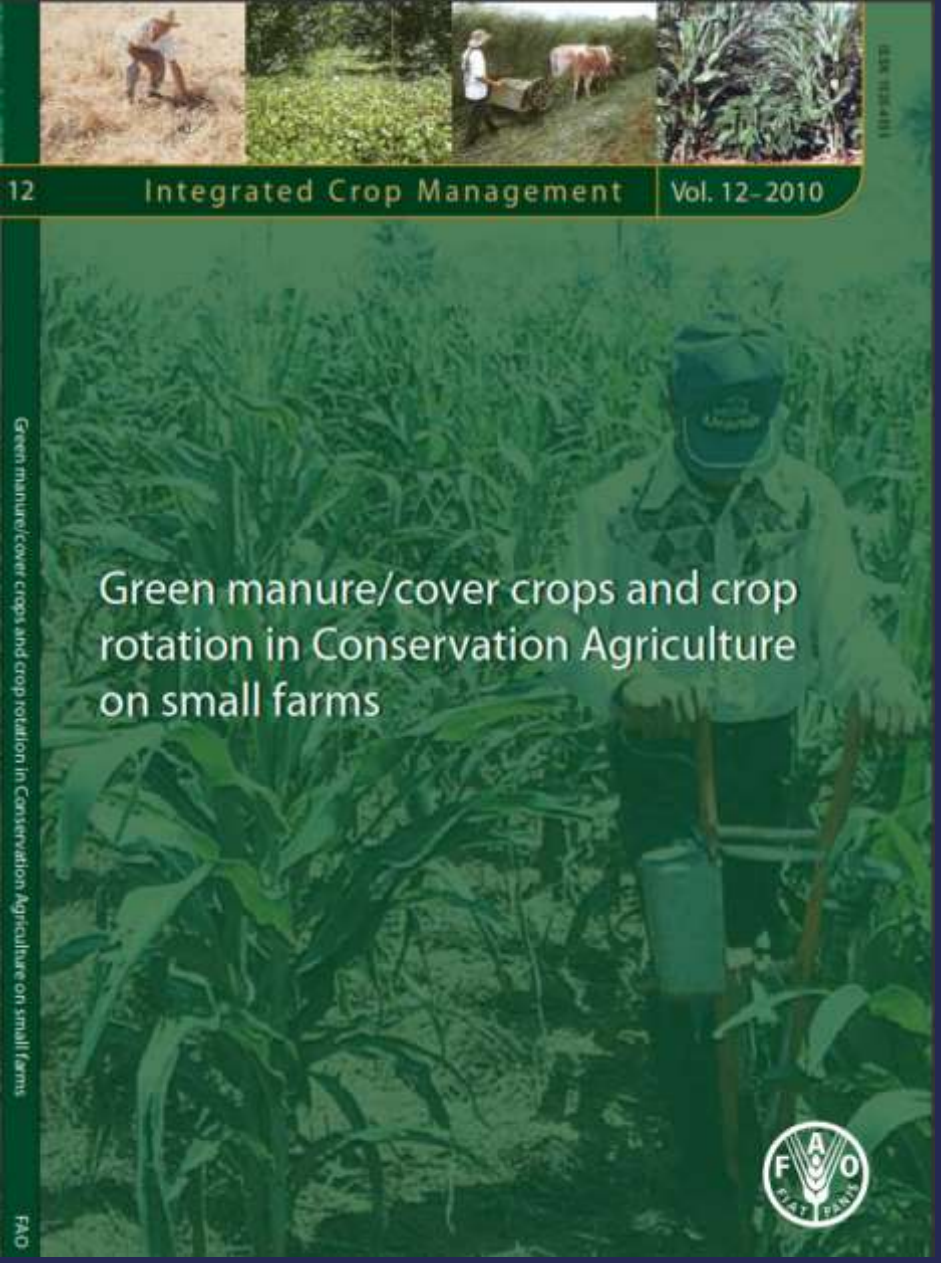
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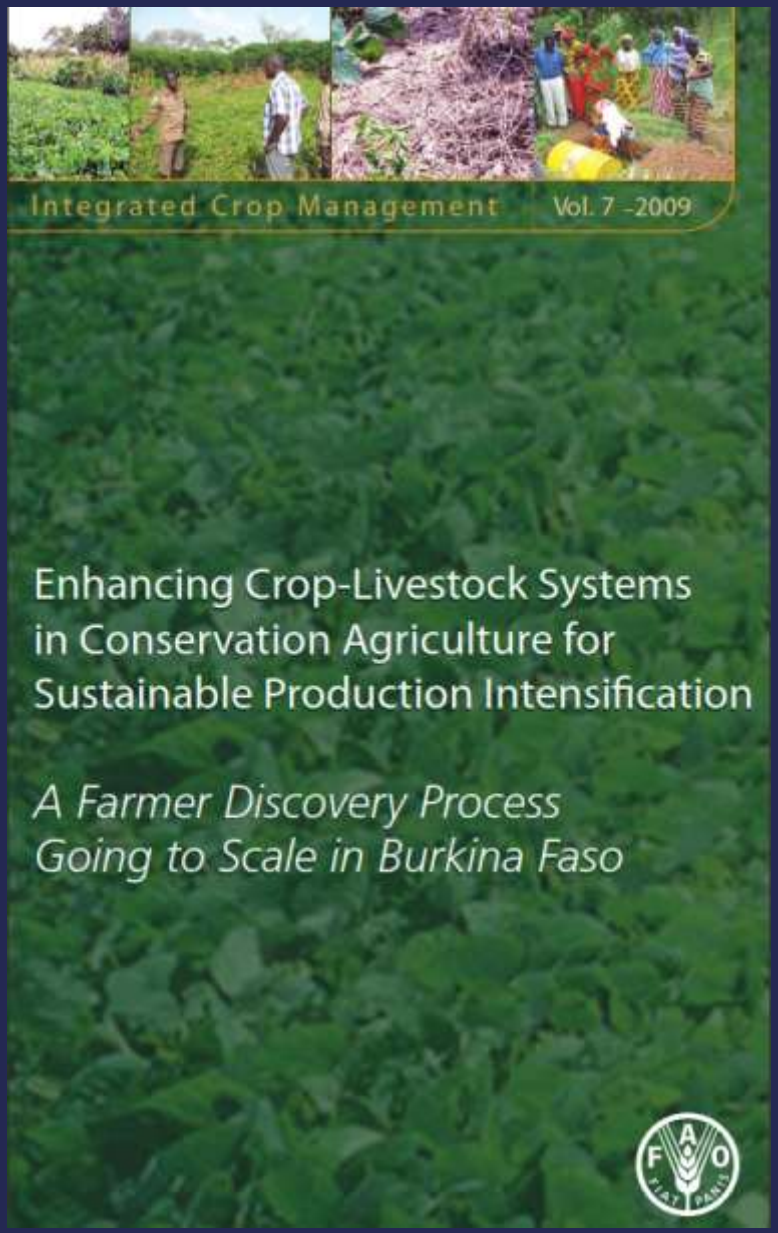
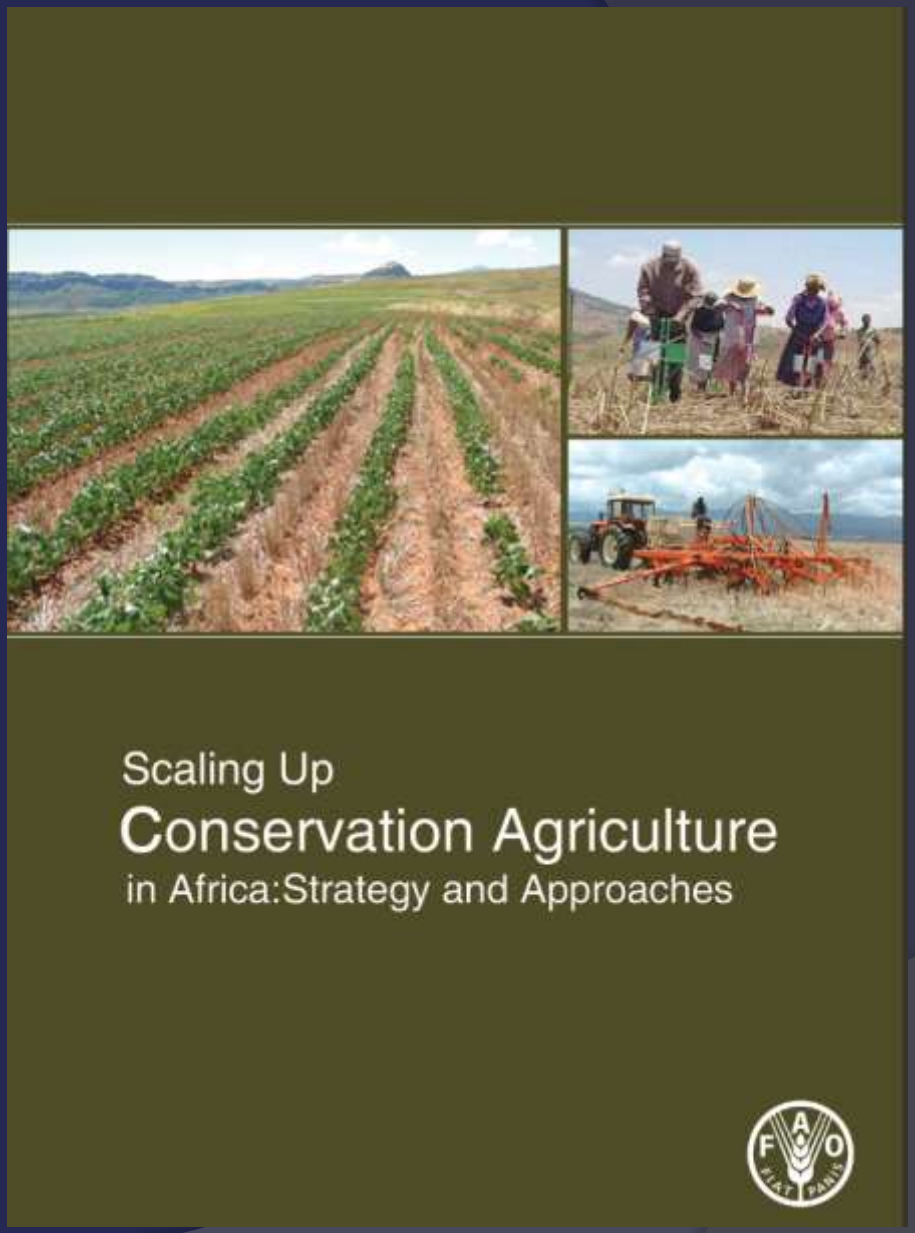
Green manure/cover crops and crop rotation in Conservation Agriculture on small farms
FAO


Integrated Crop Management
Vol. 10-2010
Conservation Agriculture and Sustainable Crop Intensification in Lesotho


Integrated Crop Management
Vol. 7 -2009
Enhancing Crop-Livestock Systems in Conservation Agriculture for Sustainable Production Intensification
A Farmer Discovery Process Going to Scale in Burkina Faso


Scaling Up
Conservation Agriculture
in Africa:Strategy and Approaches

Integrated Crop Management Vol. 5-2007

Tropical crop–livestock systems in conservation agriculture

The Brazilian experience

Conservation Agriculture

A manual for farmers and extension workers in Africa

A.C.T.

IIRR

Conservation Agriculture Case Studies - a series of case studies on conservation agriculture in 5 countries

Ghana

Kenya

Tanzania

Uganda

Zambia

Education

Inter/National networking and information exchange

Political advocacy

Subjects or curricular units

UNIFENAS (Universidade de José de Rosário Vellano):
Plantio directo (Direct Drilling)

UnB (Universidade de Brasilia):
Sistema de Plantio Direto (Direct Drilling System)

UNICRUZ (Universidade de Cruz Alta):
Plantio Direto (Direct Drilling)

USP (Escola Superior de Agricultura “Luiz de Queiroz”):
Plantio Direto (Direct Drilling)

University of Hohenheim/Germany
Conservation Agriculture

University of Évora/Portugal
Conservation Agriculture

Inter/National networks

ECAF

European Conservation Agriculture Federation

CONFEDERACION DE ASOCIACIONES AMERICANAS PARA LA AGRICULTURA SUSTENTABLE

CAAPAS

PACA

Professional Alliance for Conservation Agriculture

PACA is a CASA-Society STADD initiative focused on bringing about a change in agriculture for the benefit of farmers and environment

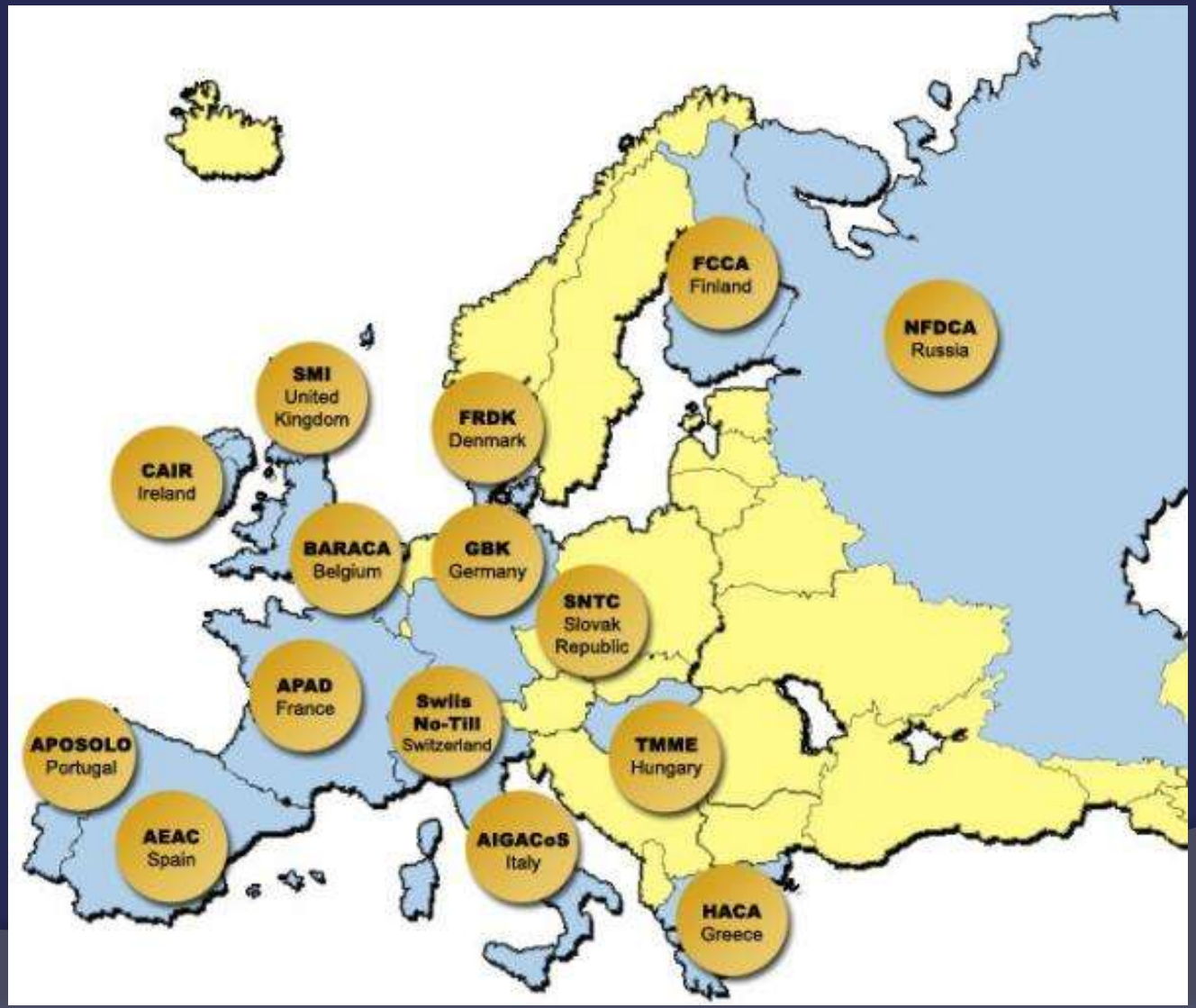
Political advocacy

Key issues of CA research: continue to be all aspects related to the introduction of and the respect for the principles of CA, i.e. minimum soil disturbance, permanent soil cover and crop diversity.

- adequate equipment for crop establishment, especially for resource-poor smallholdings;
- integrated weed control strategies;
- best residue management practices and crop residue alternatives (alternative mulching materials) to guarantee soil cover;
- crop species/varieties selection for different purposes and applications (mulching, mixed and inter-cropping, nitrogen fixation, weed suppression, etc.)
- crop rotations;
- crop-livestock integration (where applicable)


Thank you
For your attention!

European Conservation Agriculture Federation (ECAF)



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