Conservation Agriculture Principles
Making Sustainable Agriculture Real

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Soil degradation processes are very expensive - unaffordable - for EU Society

<table>
<thead>
<tr>
<th>SOIL DEGRADATION</th>
<th>ANNUAL COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion</td>
<td>€0.7 – 14.0 billion</td>
</tr>
<tr>
<td>Organic matter decline</td>
<td>€3.4 – 5.6 billion</td>
</tr>
<tr>
<td>Compaction</td>
<td>Cannot be estimated</td>
</tr>
<tr>
<td>Salinisation</td>
<td>€158 – 321 million</td>
</tr>
<tr>
<td>Landslides</td>
<td>Up to €1.2 billion per event</td>
</tr>
<tr>
<td>Contamination</td>
<td>€2.4 – 17.3 billion</td>
</tr>
<tr>
<td>Biodiversity decline</td>
<td>Cannot be estimated</td>
</tr>
</tbody>
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(European Commission, Soil Thematic Strategy, 2006)

The total costs of degradation would be up to **€38 billion annually for the EU**
River Thames, London
House of Parliament

Guadalquivir river, Spain
The main cause of soil degradation is soil tillage
Stagnating Yields in Europe

Rising-plateau regression analysis of wheat yields throughout various European countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Year of stagnation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>1995 (**)</td>
</tr>
<tr>
<td>France</td>
<td>1996 (**)</td>
</tr>
<tr>
<td>Germany</td>
<td>1999</td>
</tr>
<tr>
<td>Italy</td>
<td>1994</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1993 (**)</td>
</tr>
<tr>
<td>Spain</td>
<td>1989</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1990 (**)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1996 (**)</td>
</tr>
</tbody>
</table>

(Brisson et al. 2010)
The principles of Conservation Agriculture

- No or minimum mechanical soil disturbance by – seeding or planting directly into untilled soil

- Enhance and maintain organic matter cover on the soil surface – using crop residues and cover crops to protect & feed soil life

- Diversification of species – both annuals and perennials

Conservation Agriculture is a combination of several resource conserving practices simultaneously creating synergies between them for optimization & sustainability.

Conservation Agriculture enhances the resilience of natural resources and promotes agricultural practices that favour a circular economy.
Conservation Agriculture is a holistic approach to sustainability.
CA does not solve ALL problems (NO panacea) but complemented with other good practices. CA base allows for high production intensity and sustainable agriculture in all land-based production systems (rainfed & irrigated, annual, perennial, plantation, orchards, agroforestry, crop-livestock, rice systems).
CONVENTIONAL FARMING

Modification of the environment to seed (soil)

CONSERVATION AGRICULTURE

Adaptation of the plant and the technology to seed in different environments (system)
No-tillage in Switzerland
No-tillage in Italy
No-Tillage in Germany
No-tillage in the UK
A healthy soil in agriculture is a living biological system
Benefits
Runoff and Erosion control

The same field, the same slope, the same crop!

Conventional tillage  Conservation Agriculture
No-tillage + residues
Benefits of Conservation Agriculture
Climate change mitigation

Carbon sequestered in the soil (t/ha) after 4 seasons in Conservation Agriculture

Increased to 56% of carbon sequestration over conventional agriculture

Results of the LIFE+ Agricarbon project. www.agricarbon.eu
Benefits of Conservation Agriculture

Energy reduction

Average reduction of 19% of energy consumption compared to conventional agriculture.

Results of the LIFE+ Agricarbon project. www.agricarbon.eu
Conservation agriculture has provided cost savings of 9.5% in wheat, sunflower in 21.6% and 14.4% in legumes.

Results of the LIFE+ Agricarbon project. www.agricarbon.eu
Worldwide adoption of Conservation Agriculture

History and global adoption of CA
Source: FAO, Kassam et al. (2015)
Conservation agriculture gives answer to Global Challenges (Europe 2020 Strategy)

- Recognized as "Climate Smart Agriculture" by UN-FAO
- Key for some of the Sustainable Development Goals
- Crucial agent for the COP21 “4x1000 initiative”

- ... and for CAP
What we need now to make Sustainability real in CAP?

- Diversity of Rural Areas
- Natural Constraints
- Environment Biodiversity
- Production Productivity
- Climate change
- Competitiveness Farm income
- CAP 2020
Benefits of Conservation Agriculture

- Increased soil carbon sink effect
- Less CO$_2$ emissions
- Increased farmer profitability
- Less production costs
- Maintaining crop yield
- Improved biodiversity
- Drastic reductions in fuel consumption
- Reduction of the time needed for farm work
- Increased in water use efficiency
Thank you for your attention

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