

Round Table n° 3

Overview of innovative AECMs implemented in the Member States

The case of Conservation Agriculture (No Tillage) in the Rural Development Plan of Veneto Region

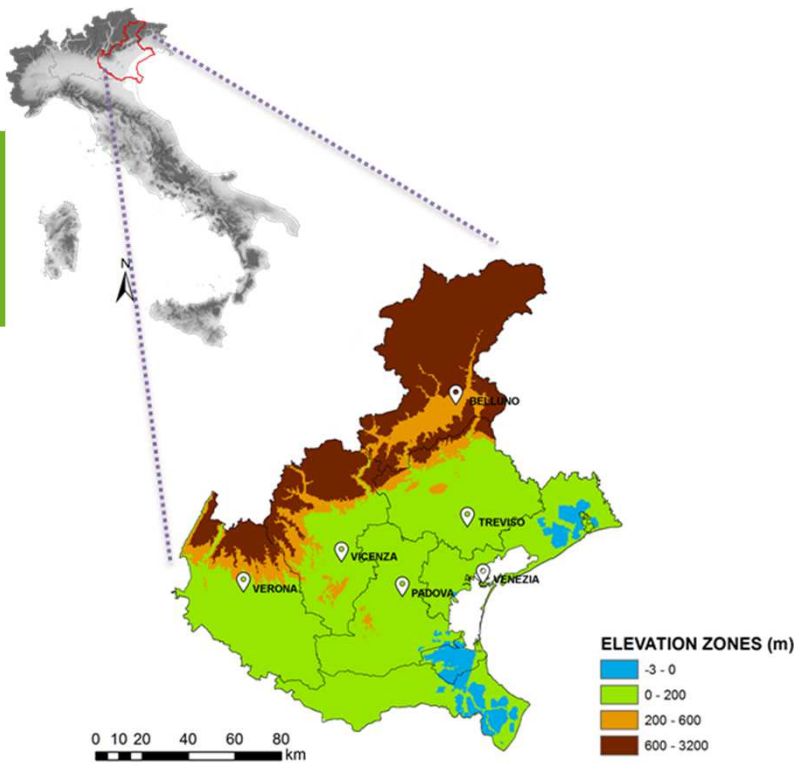


REGIONE DEL VENETO

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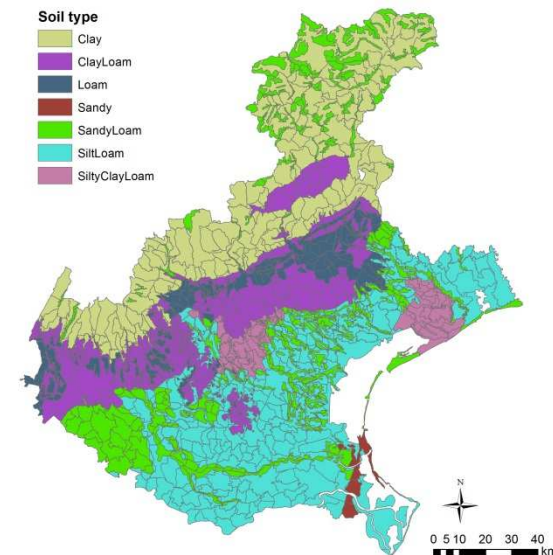
Environmental issue



- High anthropogenic pressures and increasing conflicts for natural resources
- Intensive agriculture coexists with one of the most densely populated and industrialized area of Italy
- > 350 people/km² in the Po valley

- **Veneto region:** 18400 km² (**55% alluvial plain**)
- **Climate:** continental sub-humid
- **T_{mean}** 7-15 °C; **P** 700-1400 mm y-1
ET₀ 750-1100 mm y-1
- Farming covers ≈ 57% of regional land, mainly in the plain area (92%)

- **Soils range from silty and sandy-loam in the plain** to clay and clay-loam in the mountains and piedmont areas
- **SOM: 1-2% in the plain**, up to 4-6% in the mountain
- Specific measures of RDP to
+ soil quality
+ water quality
- GHGs emissions



What is Conservation Agriculture (CA)?

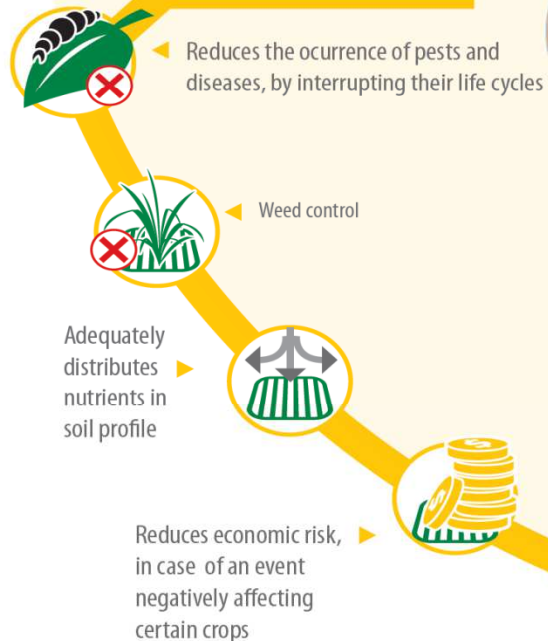
Sustainable farming system based on 3 principles

Crop rotation decreases pest, disease and weed pressure.

What is crop rotation?

The successive planting of different crops in the same field, following a specific order. For example, maize-beans-sunflower or maize-oats.

Benefits of crop rotation



1



2

Minimal soil movement

Benefits of reduced tillage

Avoids compaction and soil surface sealing

Reduces erosion



Improves soil fertility and structure



3

Soil coverage with residue of the previous crop, cover crop, or both

What is crop residue?

Crop residue or stubble is the accumulation of dried up plant parts left on the field, including cover crops or green manure

Benefits of soil cover

- Higher water infiltration and available soil water content
- Less evaporation



- Less water and wind erosion
- Soil temperature is buffered



- Increases biological activity and soil organic matter



CA - No Tillage: Kind of commitments

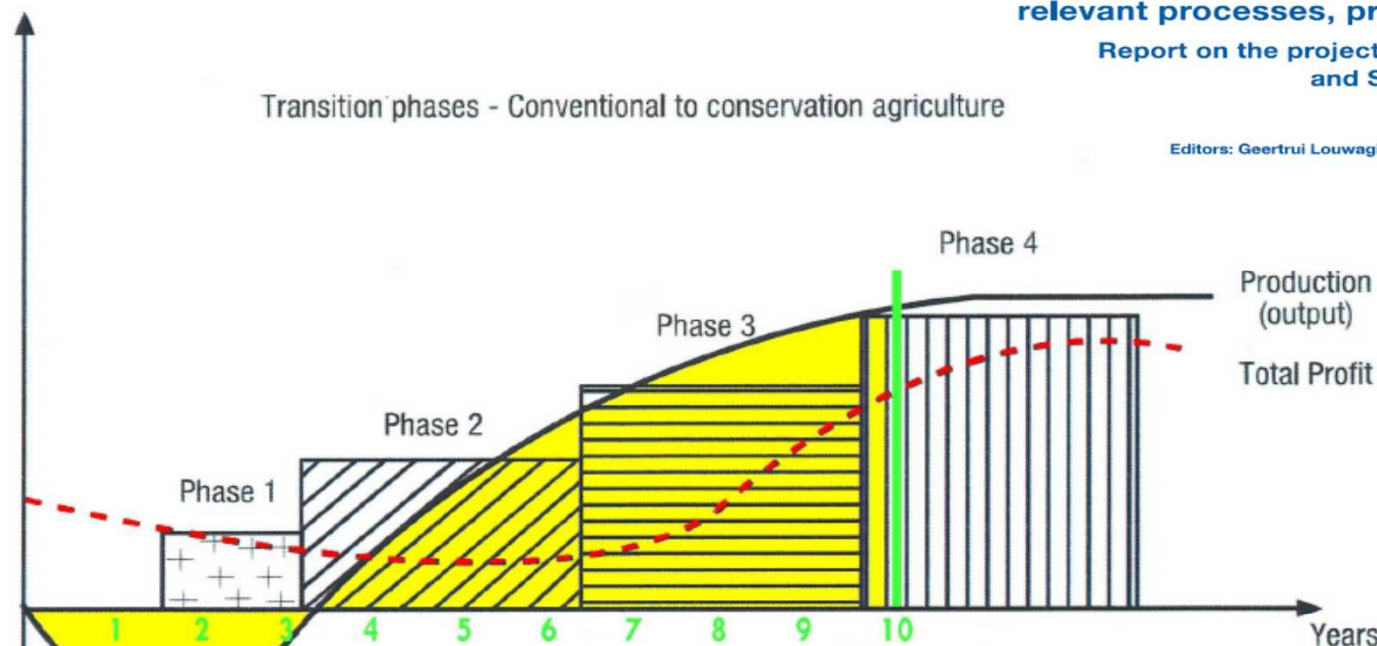
Farmers applying for the measure have to comply with the following commitments:

1. A minimum of **20% of the farm** cultivable land. He must maintain the commitment in the same land at least five years continuously.
2. It is **prohibited to plough** and to perform any kind of mechanical labour before and after seeding.
3. He must **maintain crop residues** of the primary culture (mulching) uniformly on site.
4. He must **adopt rotation of different crops** respecting a **maximum** period of **40 days** between harvesting the crop and sowing the next.
5. He must **adopt exclusively the sod seeding**, consisting in the deposition of the seed in the ground without altering the existing structure, and close the seed furrow without overturning the soil (using a device called "beaver tail").
6. **Fertilization**: distribute organic and inorganic fertilizers prior to the drying stage of the cover crop and distribute in order localized fertilizers on crop in hedging.
7. **Harvesting**: thresh with low-pressure tires, twin wheels or tracks, making sure that they do not originate furrows or compacting (the combine must be emptied frequently).
8. **Scouting** and control plant diseases, insect fauna, weeds:
 - a) preliminary scouting, **at the end of the winter phase** to evaluate the most appropriate conditions for development of the primary culture
 - b) scouting continuous **post seeding** for evaluating the development of **slugs** underground and above-ground
 - c) if there are too many slugs , in that case it's permitted **formulated used in organic farming**.

Calculation of loss of income

**Addressing soil degradation in EU agriculture:
relevant processes, practices and policies**
Report on the project 'Sustainable Agriculture
and Soil Conservation (SoCo)'

Editors: Geertrui Louwagie, Stephan Hubertus Gay, Alison Burrell
Authors: SoCo Project Team



**Figure 3.7 : Transition phases of
conservation agriculture adoption**

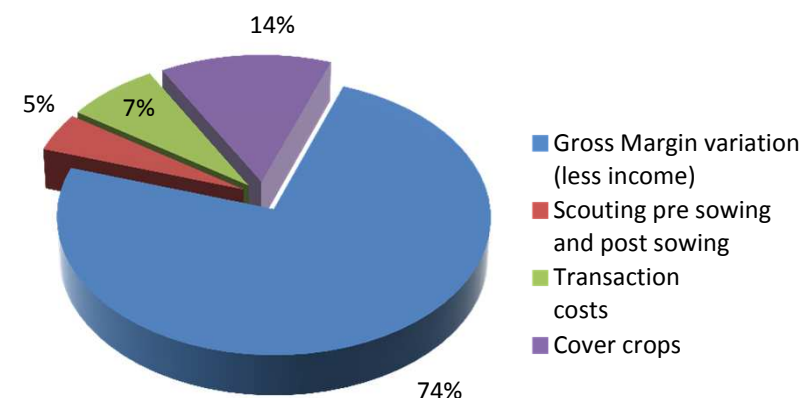
First phase: improvement of tillage techniques; second phase: improvement of soil conditions and fertility; third phase: diversification of cropping pattern; fourth phase: the integrated farming system is functioning smoothly
Source: FAO, 2004 (modified)

Calculation of loss of income and higher costs

Year	Conventional method		No Tillage introduction		
		Gross margin (A)		Gross margin (B)	Cover crops (C)
1	wheat	791	wheat	89	256
2	maize	820	maize	-271	256
3	soybean	721	soybean	169	
4	maize	820	Wheat	89	
5	maize	820	maize	-271	256
Average	€/ha	794		-39	153

	€/ha	
1) Gross Margin variation (A-B)	833	74%
2) Total Additional costs	204	18%
- cover crops	153	14%
- scouting pre sowing and post sowing	51	5%
3) Transaction costs	83	7%
TOTAL (1+2+3)	1.121	

PERCENTAGE BREAKDOWN OF PAYMENT FOR
No Tillage INTRODUCTION



RDP: No Tillage Results		Farmers	Hectares	€ per year
2007-2013	Mis. 214/i	105	2426	963.008
2014-2020	Mis. 10.1.1	83	2400	1.217.539

APPLICABLE AMOUNTS AND SUPPORT RATES:

Conservative agriculture: No Tillage – introduction: **600 €/ha** per year, for a period of 5 years.
Conservative agriculture: No Tillage –manteinance: **530€/ha** per year, for a period of 5 years.

AREAS ELEGIBLE FOR PAYMENTS:

Agricultural utilized area of Plain and Hill in Veneto Region.

What are the environmental issue being addressed through this measure?

• Multi-Electrode 3d Resistivity Survey on Soil Structure in Conservation Agriculture

I. Piccoli, N. Dal Ferro, B. Lazzaro, L. Furlan, S. Macolino, A. Berti, F. Morari – ". 7th CONGRESS OF THE EUROPEAN SOCIETY FOR SOIL CONSERVATION "Agroecological assessment and functional-environmental optimization of soils and terrestrial ecosystems"; Moscow, Russian Federation, May 17-23, 2015

• Disentangling the effects of conservation agriculture practices on the vertical distribution of soil organic carbon. Evidence of poor carbon sequestration in North-Eastern Italy

Piccoli, F. Chiarini, P. Carletti, L. Furlan, B. Lazzaro, S. Nardi, A. Berti, L. Sartori, M.C. Dalconi, F. Morari – "Agriculture, Ecosystems and Environment, Volume 230, 16 August 2016, Pages 68–78.

• Assessing the role of agri-environmental measures to enhance the environment in the Veneto Region, Italy, with a model-based approach

N. Dal Ferro, E. Cocco, B. Lazzaro, A. Berti, F. Morari – "Agriculture, Ecosystems and Environment, 232 (2016), [312-325]

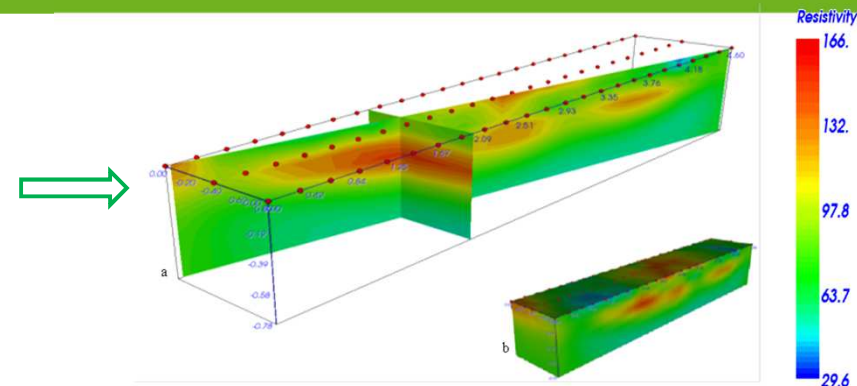


Figure 1 - 2D section (a) and 3D volume (b) of F1 site under CT management. Resistivity is expressed in Ωm . Plough sole is visible between 20 and 40 cm with resistivity higher than 120 Ωm (orange-red colour).

CA very good for C stock, N leaching due to soil cover, even in areas characterized by loose soils.
But only 0-30 cm C stock balance!

- Adopting AEMs improved the agroecosystems across the Veneto region
- The effectiveness of AEMs was different in a spatiotemporal perspective → address agro-environmental policies towards a spatial target approach instead of a generalized support to farmers
- Long-term evaluation of AEMs is sometimes required (e.g. organic farming)
- N fertilizer management (reduced mineral N, change to organic N) is sometimes inefficient unless combined with others
- Best strategies for N cycle improvement include i) permanent soil cover; ii) minimum soil disturbance



IMPROVING SOILS QUALITY AND STRENGTHENING THE ADAPTATION TO CLIMATE CHANGE THROUGH SUSTAINABLE TECHNIQUES OF CONSERVATION AGRICULTURE

The conservation agriculture practices can contribute significantly to increase the resilience and adaptation of terrestrial ecosystems to climate change while representing a mitigation strategy in agricultural sector. The LIFE HELPSOIL project seeks to achieve testing and demonstration of CA techniques combined with innovative management practices of agricultural soils, in order to assure the sustainable use of the soil and preserve its functions.

The project actions concern **the Po plain and the nearby Alpine and Apennine foot-hills** and are applied in **20 demonstrative farms**.

<http://www.lifehelpsoil.eu/>



THANK YOU FOR YOUR ATTENTION

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