

***the AGRICARE project:
Introducing innovative precision farming techniques in
AGRICulture to decrease CARbon Emissions***

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Project LIFE+ "AGRICARE"



" Introducing innovative precision farming techniques in AGRIfulture to decrease CARbon Emissions "

LIFE13 ENV/IT/000583



Under the call LIFE+ Environment Policy and Governance



Innovation transfer - Veneto Agricoltura (Coordinator) Trials management, Demo Day

Machineries manufacturing Maschio Gaspardo SpA (Partner) Machineries - Trials

Research agency ENEA (Partner) Energy and environmental balances – LCA - Training

Research group Università di Padova (Partner) Agronomic management and assessment

Agriculture and mitigation policies

Agriculture sector must reduce its GHG emission and contribute significantly to world and EU environmental goals

Main options could be:

- *To reduce direct emission (e.g. tractors. gasoil – fertilizers, N2O)*
- *Store, keep and/or increase Soil carbon content*
- *To decrease indirect emission (input: fertilizers, pesticides, seeds)*

Project keywords

Test, Demonstrate, Evaluate, Support, Diffuse



LIFEI3 ENV IT 0583 AGRICARE

Introducing innovative precision farming techniques in Agriculture to decrease Carbon Emissions

Project in brief:

Timetable mid 2014 – 2017 (3 years)

Budget: € 2.577.825 (total); € 971.480 (EU contribution)

Main scope: to test and implement innovative techniques for more environmental friendly cropping systems and encouraging the transfer of innovation to farms.

Actions:

- 1) To test prototypes for Conservative agriculture managed with PF tecniques versus Conventional management systems.
- 2) Evaluation of energy and environmental benefits and modelling of long term effects of innovative techniques at farm level and diffusion potential.
- 3) Analysing and understanding barriers to innovation diffusion and identify systems to accellerate technology and knowledge transfer to farmers.

Main project activities/actions

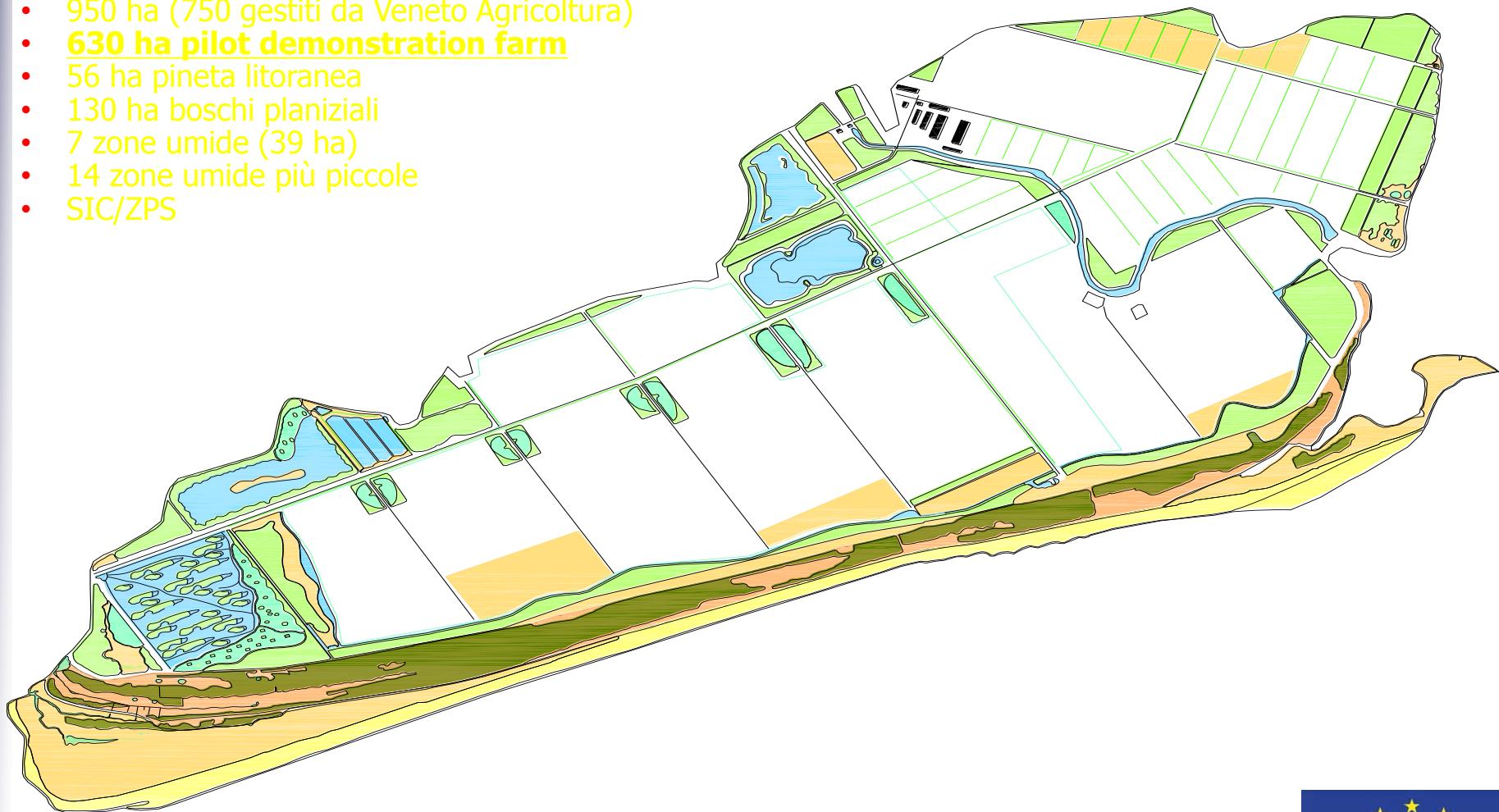
- ✓ Integrating Conservative and Precision agriculture
- ✓ Soil management, carbon emission reduction, energy balance
- ✓ Using innovative prototypes
- ✓ Demonstration trials
- ✓ Modelling results for long term benefits assessment
- ✓ Understanding barriers to innovation adoption
- ✓ Developing a web tool for farmers support
- ✓ Addressing Carbon Credits issue for policy maker advise



Demonstration trials, Where?

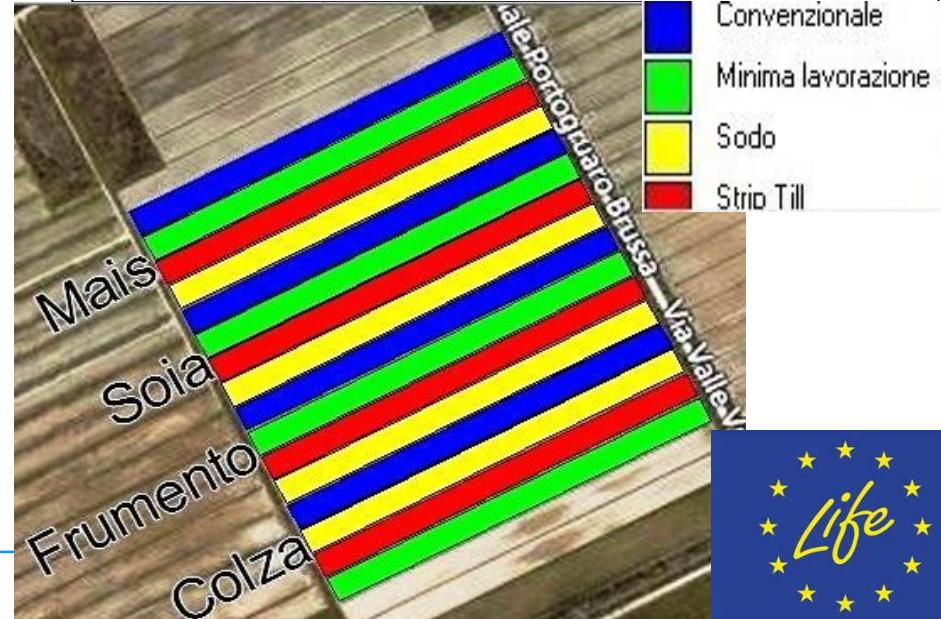
Pilot Farm close to Venice, Vallevacchia, Caorle

- 950 ha (750 gestiti da Veneto Agricoltura)
- **630 ha pilot demonstration farm**
- 56 ha pineta litoranea
- 130 ha boschi planiziali
- 7 zone umide (39 ha)
- 14 zone umide più piccole
- SIC/ZPS



Three different LIFE projects are in progress at the same time

Pilot farm Vallevecchia



Experimental fields: 16

Total surface: 23,2 ha

Rotation: wheat, canola, soybean, maize

Techniques comparison:

- Traditional (CT)
- Minimum Tillage (MT)
- Strip-tillage (ST)
- Sod Seeding (NT)



Techniques under test

CT



MT



ST



NT

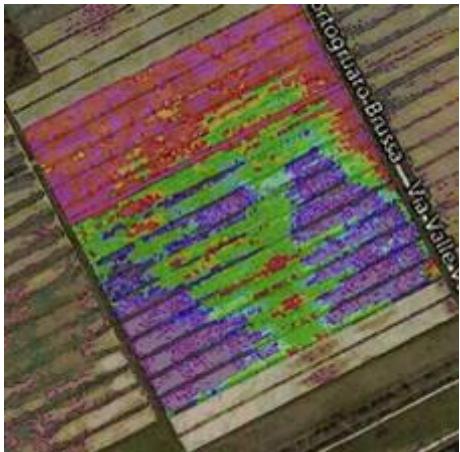


**CT Traditional,
ST Strip Tillage,**

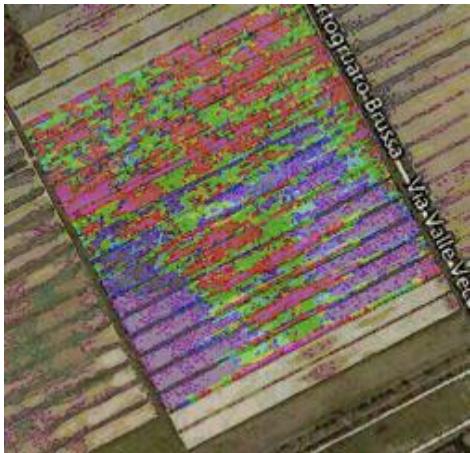
**MT Minimum,
NT Sod seeding**

Field variability assessment

ARP analysis (Automatic Resistivity Profiling)

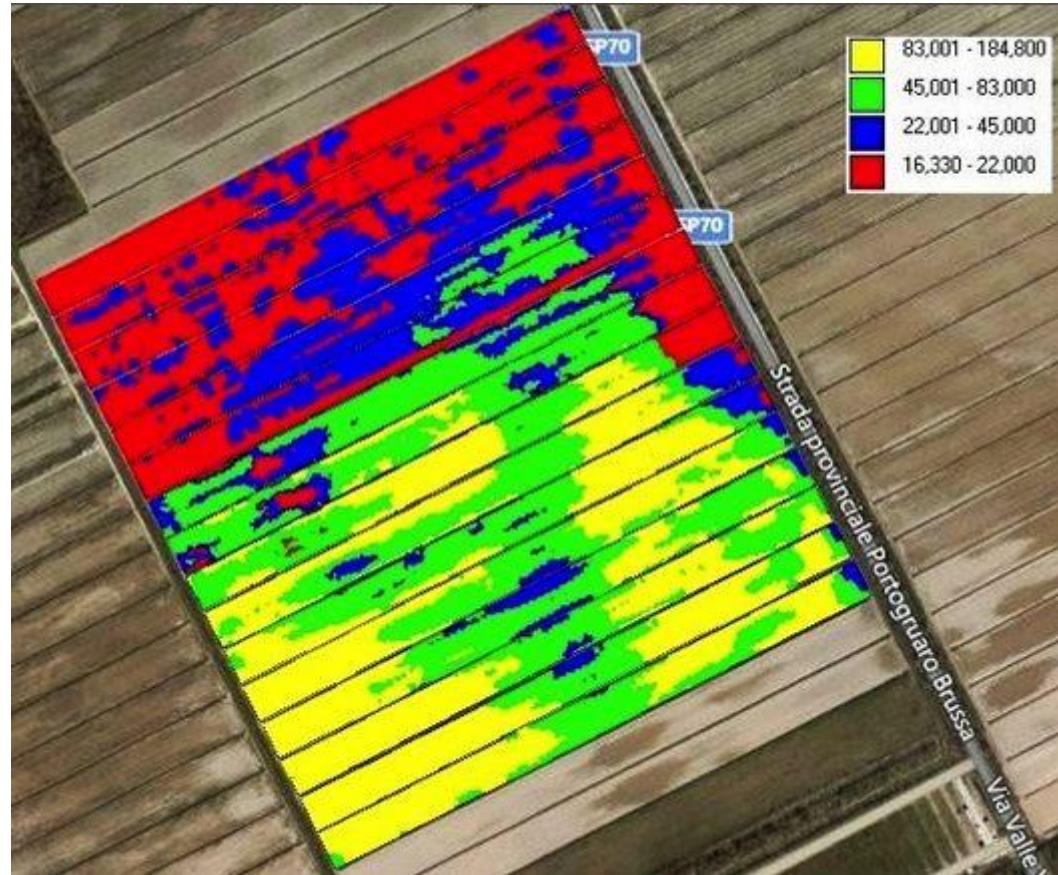


ARP level 0-100 cm



ARP level 0-200 cm

ARP – Level 0-50 cm



Integrating information for mapping



Define homogeneous areas



| TOTALE STATISTICA | ZONA A | ZONA B | ZONA C | ZONA D | | | | |
|--------------------------------------|--------|--------|--------|--------|--------|------|--------|----|
| Conduttività elettrica (dS/m) | 1,82 | aA | 2,01 | aAB | 2,26 | abAB | 2,39 | bB |
| Indice SAR (Sodium Adsorption Ratio) | 0,46 | ns | 0,50 | ns | 0,35 | ns | 0,32 | ns |
| pH | 7,25 | aA | 7,53 | bB | 7,54 | bB | 7,48 | bB |
| Calcare attivo (%) | 4,07 | aA | 3,83 | aB | 3,46 | bC | 3,48 | bC |
| Azoto totale (%) | 0,06 | aA | 0,06 | bA | 0,08 | cB | 0,11 | dC |
| Sostanza organica (%) | 1,22 | aA | 1,23 | aA | 1,71 | bB | 2,38 | cC |
| Fosforo assimilabile (mgP2O5/kg) | 32,83 | ns | 30,00 | ns | 30,86 | ns | 29,50 | ns |
| Potassio cambiabile (mgK2O/kg) | 115,83 | aA | 121,67 | aA | 151,00 | bB | 154,25 | bC |
| Argilla (%t.f.) | 15,17 | aA | 16,33 | aA | 22,14 | bB | 32,00 | cC |
| Limo (%t.f.) | 25,33 | aA | 24,67 | aA | 36,14 | bB | 47,75 | cC |
| Sabbia (%t.f.) | 59,50 | aA | 59,00 | aA | 41,71 | bB | 20,25 | cC |

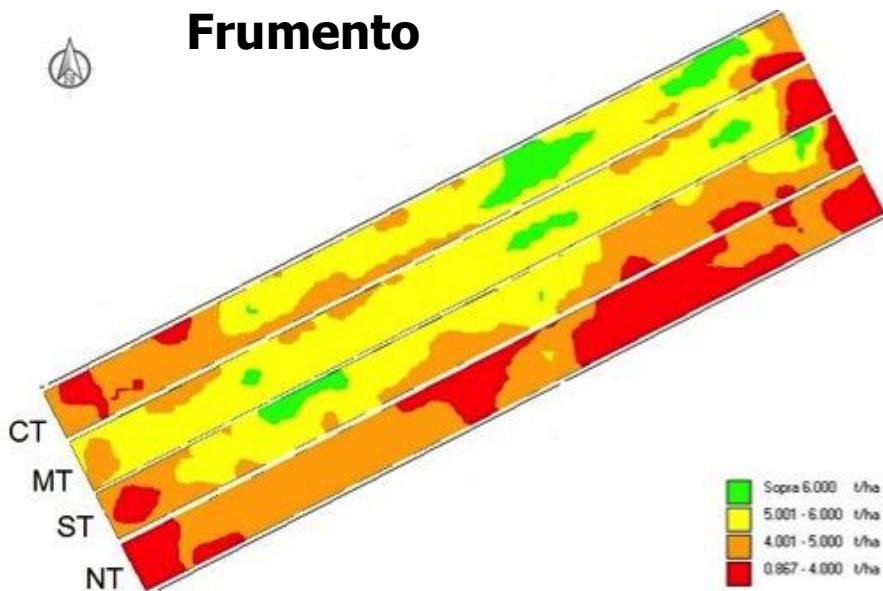
Wheat fertilization maps and seed density

| Crop | Demotest | Zone | Rate seed (pp/mq) | N application (kg/ha) |
|-------|----------|------|-------------------|-----------------------|
| Wheat | CT | - | 500 | 178 |
| | MT | A | 500 | 150 |
| | | B | 500 | 190 |
| | | C | 500 | 140 |
| | ST | A | 260 | 150 |
| | | B | 260 | 190 |
| | | C | 260 | 130 |
| | NT | A | 550 | 150 |
| | | B | 550 | 190 |

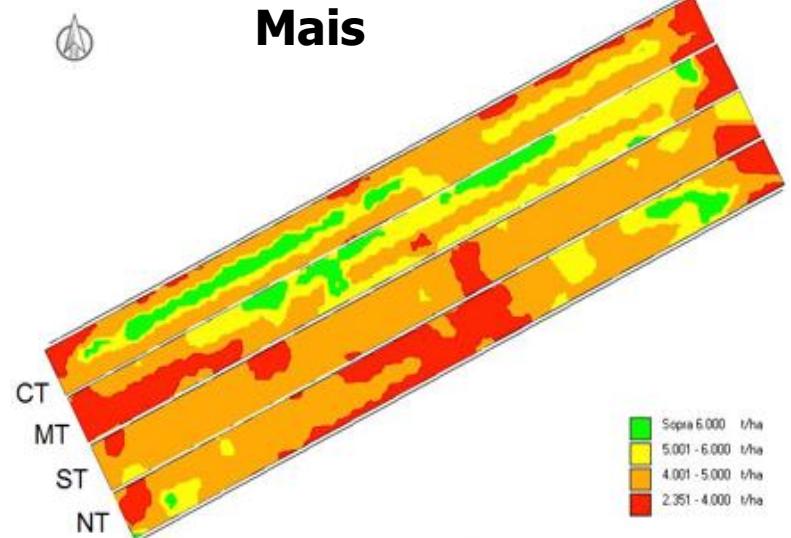


Results mapping Yield

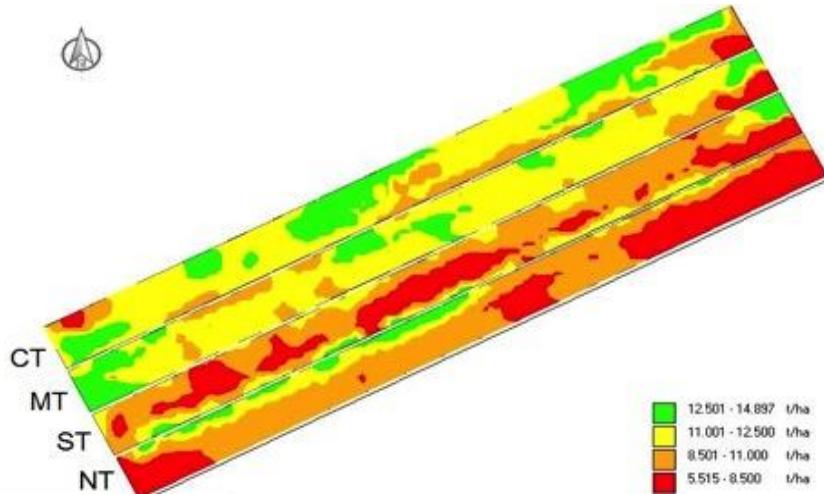
Frumento



Mais

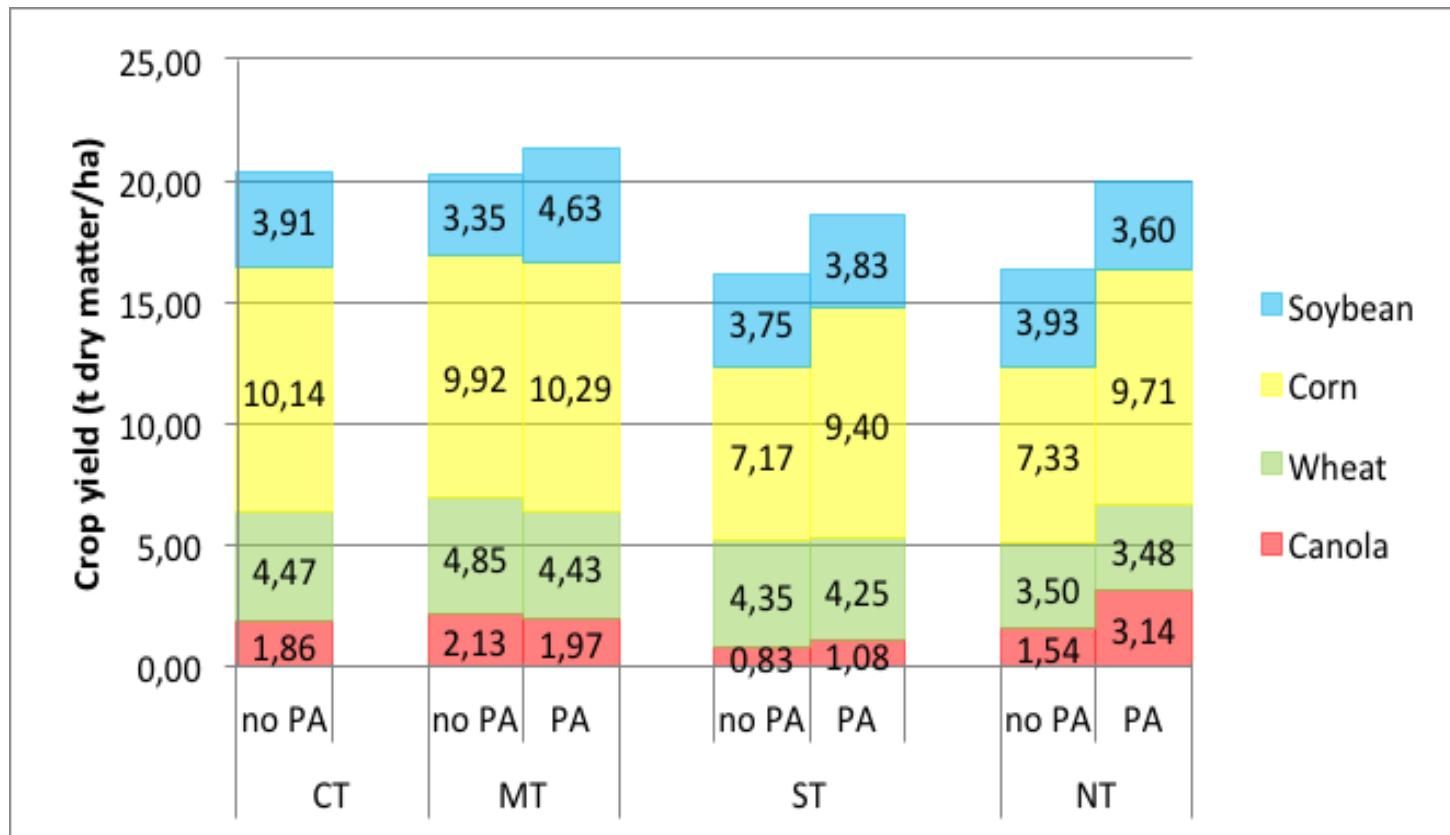


Soia



Preliminary results : Yields

4 crops, 4 techniques with or/not PA: 83 different trials



CT Traditional , MT Minimum, ST Strip, NT No tillage





Agriculture has significant responsibilities and duties about climate change issues.

Mitigation and adaptation strategies are challenges to innovate methods, techniques and could be the road for an increasing farming competitiveness and wider impact reduction

*Agricare project received an award in the last EIMA edition 2016 for the environmental value of Maschio Gaspardo innovative machineries that resulted in **smaller carbon footprint and reduced soil disturbance.***

Project Team

VENETO AGRICOLTURA: Furlan L, Zampieri G, Fagotto F, Barbieri A.

MASCHIO GASPARDO: Donadon G, Centis C.M., Perlari A.

UNIVERSITA' DI PADOVA: Sartori L, Pezzuolo A, De Cillis D.

ENEA: Colonna N., Colucci F, Giordano L, Stefanova M, Pona C.

