ITALIAN PILOT AREA

Piana di Tarquinia

FATIMA

PRODUCE MORE WITH LESS

- **One of the most extensive area of agricultural production in Lazio Region, Italy**
- **It's a plan area where the main activities are tourism and agriculture**
- **The agriculture of the area is intensive and very varied with a range of irrigated and rainfed productions**

General Description

- Tarquinia's Population: **16,516 //** OVERALL SIZE: **280 km²**
- "Maremma etrusca" Water User Association (WUA) administrative area: **159,859 ha**
- Piana di Tarquinia area: **8,527 ha**
- WUA Irrigated infrastructures: **8,049 ha**
- Irrigated surface: **4,790 ha (56% of the total administrative area)**
- Rainfall avg time series: **614 mm // Annual ET: 540mm**
- Irrigation system: **microirrigation/ sprinkler**
- Major Crop Types: **Cereals (in particular wheat) 49%, Forage 23%, Orchards 13%**

Pilot Area features

- Pilot area included in the Nitrate Vulnerable Zone (NVZ).
- Intensive agricultural management due to the excessive N fertilizer application and water consumption
- Groundwater pollution of the area due to excessive inputs.
- Climate typical Mediterranean (dry summer that need irrigation).

Experiments in Italian Pilots

- 2 years/2 crops. Summer: processing tomatoes, Winter: wheat
- Monitoring activity of soil and nutrient management on field trials with different cropping systems and nutrients inputs
- Nutrient C and N modeling defining the sustainable management in the mid-long term, proposing alternative cropping strategies
- Extrapolate the evaluation from plot to geographic scale integrating remote sensing N status evaluations
- Monitoring of water balance to determine irrigation efficiency using satellite images and field soil moisture sensors.
- Evaluating N status using Sentinel-2 spectral indexes and proximal sensors and Lab measurements.

The experimental plots were set up in a wheat and processing tomatoes fields with different types of N fertilizer (synthetic, slow release and organic N fertilizers). In coincidence of Sentinel-2 overpasses experimental data included: i) green plant sampling at different growth stages; ii) Leaf Area Index (LAI) non-destructive measurements by using a portable LICOR LAI 2000 Plant Canopy Analyser; iii) chlorophyll measurements by means of the MC-100 Apogee Concentration meter; iv) canopy reflectance by means of a hand-held hyperspectral radiometer in the spectral range is 325-1075 nm; v) crop N concentration (total N%) following the lab measures on a LECO N analyzer instrument.

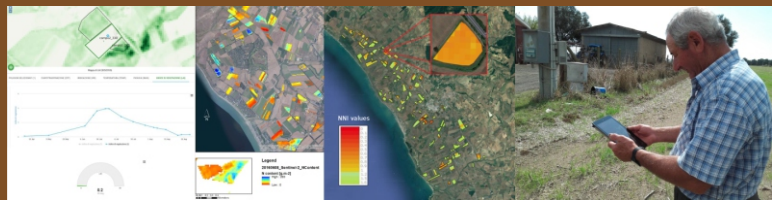
Different spectral indexes were calculated by using both in-situ spectral data and satellite observations and correlations were investigated with canopy chlorophyll and N contents.

The results have confirmed:

i)Reduction of water and nitrogen input;

ii)Leaching by Nitrogen input reduction: Wheat (over 60%), Tomato (12%) as avg of the different cropping strategies in 2016 and 2017;

iii)Organic fertilization improves soil structure. Org. Trials demonstrated that inspite reduction of N input, it didn't compromise yield drammaticaly (long term scenario).



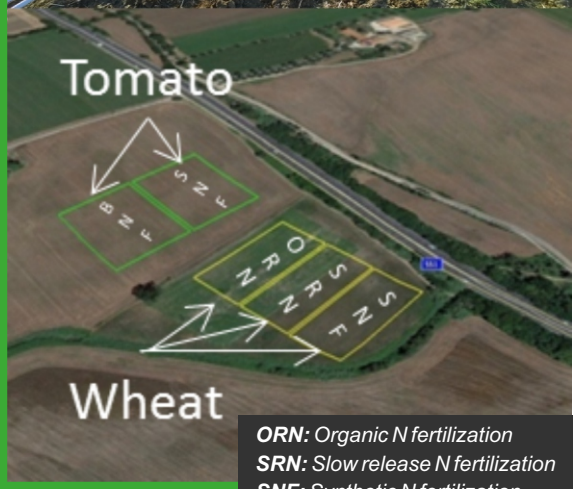
Area Pilot Area Facts & Figures

Evaluation of an Operational system remote sensing-based to give to the farmers good management recommendations by optimize the nutrient use.

Definition of a) Long term Sustainability of the cropping system management on the basis of agronomic and environmental indicators (N losses, C depletion/enrichment, water consumption, yield, N recovery efficiency, etc.) produced by modelling; b) science behind N management operational systems (connecting models and EO).

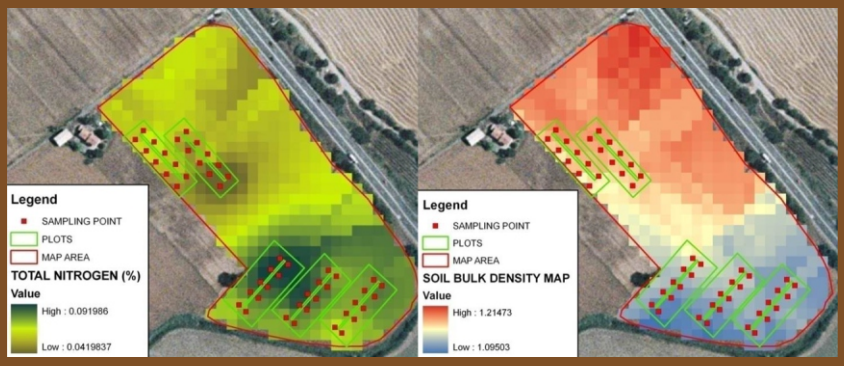
Creation of dedicated tool (FPC – Farm Performance Calculator) for Water Energy Food (WEF) indicators at farm level (environmental and economic performance)

Application of FPC for the crop "wheat" and definition of WEF indicators.



ORN: *Organic N fertilization*
SRN: *Slow release N fertilization*
SNF: *Synthetic N fertilization*
BNF: *Biological N fertilization*

Future Perspective / Regional Impact of FATIMA



Improving yields without compromising environmental integrity and public health.

Development of new subsidies and policies to ensure the sustainability of agriculture and ecosystem services

Sustainability production:

- Optimization of yields (in quantity and quality) and agricultural income
- Reduction of inputs (water, nutrient) for increase production
- Reducing environmental impact

Country Pilots regional team

crea
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

http://www.crea.gov.it

ariespace

http://www.ariespace.com/

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