FRENCH PILOT AREA

Provence Alpes Côte d'Azur

FATIMA

PRODUCE MORE WITH LESS

- **An agricultural area with a strong diversity of crops**
- **Water supply is secured by the Durance/Verdon hydraulic infrastructure**

General Description

- TOTAL POPULATION **55000** // OVERALL SIZE: **317 Km²**
- AGRICULTURE **50% (15000 Ha)**, AVERAGE FARM SIZE: **17 Ha (9 Ha in 1988)**
- IRRIGATION: **Surface Water, Punping in Ground water**
- LAND USE TRENDS: **Agricultural surface is stable with an increase in field crops and grassland and a decrease in permanent crop.**
- ANNUAL RAINFALL: **700 mm, ANNUAL ET0: 1200 mm**
- MAJOR CROP SYSTEM: **Field crop; Orchard; Grassland; horticultural crop (vegetables, flowers)**

Pilot Area features

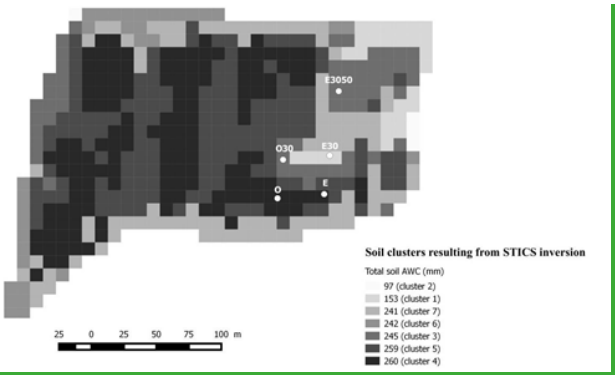
- Decrease in water resources is expected in the future due to climate change and water sharing trade off between users
- Permanent crop areas are reduced to the benefit of field crops and grasslands
- The farm surface doubled during the last 20 years. There is a willing to increase farm profitability by an optimal use of water and fertilizer.
- Management of irrigation channel association has been facing water distribution problems during shortage periods and sustainability due to competition with aquifer pumping

Experiments in French Pilots

- Sentinel 2 A images were made available to farmers and land manager to get the feedback.
- Farmers are interested by crop spatial features showing anomalies (irrigation failure, crop installation problems, infestations of weeds …)
- Land managers are interested to evaluate irrigate surface and then propose improved water sharing rule in water shortage period.
- A VRT methods was developed for Wheat nitrogen fertilization
- Field campaigns were performed at INRA research Centre and in a farm on tomato, sunflower and durum wheat crops and an assessment of water and nitrogen cycle were made to analyse our capability to represent field heterogeneity with crop models combined to remote sensing images.
- VRT trials has been implemented in farm situation for nitrogen fertilization on durum wheat

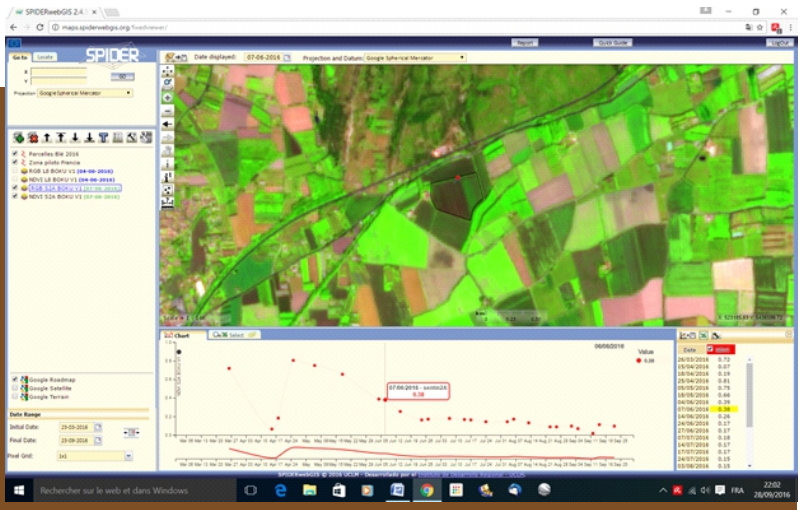
The method is based on the use of frequent remote sensing observations of the green leaf development (Leaf area index, fapar) and a crop model. It aims at giving a spatialized nitrogen fertilization recommendation for the second and the third applications. In a first step, historical data set combining series of LAI and yields are used to infer soil water capacity by inverting the STICS crop model. Then during the current year, remote sensing observations collected before the decision are analyzed to infer the initial soil nitrogen content and the quality of the crop installation. Spatialized nitrogen (N) fertilization recommendations are then computed by the screening of N application rates under a range of possible forthcoming climates using the STICS crop model, with the objective to maximize of the gross margin while respecting some environmental constraints.

Area Pilot Area Facts & Figures



The farmers who had access to the spider platform with the presentation of the Sentinel 2 satellite images were very enthusiastic about the possibility of using this information in the management of their farm. For land managers, particularly the water managers, the feedback is also positive, but the exposure of the remote sensing images, alone, remains insufficient to go further in the decision-making. The method developed for intra-field modulation of nitrogen fertilization shows the effectiveness of the method to estimate the soil water storage capacity when water stress is an important factor in crop development. In this case, the proposed method to quantify N fertilization rate avoids over-fertilization in drought sensitive areas.

Future Perspective / Regional Impact of FATIMA



The forthcoming activities will be devoted to the consolidation of the decision tools and the demonstration of their impact. The direct use of remote sensing images exposed in the spider interface will be evaluated with farmers to improve the interface ergonomic and the nature of the displayed information and collect use cases.
Concerning the water resource management, a new project will be launched to better assess crop water requirements at the scale of the irrigation area.
Improve the VRT recommendation by better taking into account crop initial conditions in the decision making process and by improving the computation efficiency to make it fully operational. The evaluation of the method will be enlarged to other field cases from the Provence pilot site as well as that of the other FATIMA pilots.

Pilots regional team

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