



SPANISH PILOT AREA La Mancha Oriental



FATIMA

PRODUCE MORE WITH LESS

- Flat plateau (650 a.s.l.) under continental-mediterranean climate
- Agriculture under severe climate constrains: low yields and low incomes in rainfeed agriculture.
- Great economic weight of irrigation agriculture, but based in by an endanger acuífer.



General Description

- **Overall size:** 10.000 km², 500.000 ha devoted to agriculture, of which 130.000 ha receive some type of irrigation).
- **Total population:** 400.000.
- **Semi-arid climate:** rainfall < 350 mm/year mainly in cold season, evapotranspiration about 1200 mm.
- **Size of farms:** 70% larger than 100 ha.
- Type of agriculture: 82% conventional, 10% organic, 7,5% conservation tillage.
- **Irrigation systems:**
 - Annual crops: 75% central pivot, other sprinkler systems 24%, 1% others.
 - Woody crops: 100% drip irrigation.
- **Mayor crops:**
 - Rainfeed:
 - Annual: winter cereals and legumes.
 - Perennial: vines and almonds.
 - Irrigation:
 - Annual: winter cereals, maize, poppy, garlic, onion, oil seed rape, and progressively short-cycle vegetables (broccoli, lettuce, carrot, potato...)
 - Perennial: vines, almonds and pistachio.

Pilot Area features

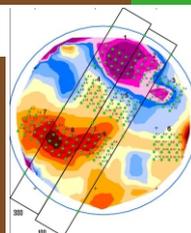
- Soil: shallow and very variable, limestone bedrock limiting root growth, texture ranging from sandy loam, loam to clay loam, often very stony.
- Rainfall: low and unpredictable rainfall pattern, high variation between seasons and between years.
- Irrigation water source: over exploited aquifer, deficit 82 hm³/year (inputs 323 hm³/year-outputs 405 hm³/year). Water depth 60-200m, very demanding in energy cost.
- Environmental threats:
 - Nitrates groundwater pollution.
 - Soil erosion.
 - Landscape degradation.
- Farm technology:
 - Fairly updated irrigation systems.
 - High level of mechanization.
 - Some innovative farmers with economic resources to invest in management improvements new technologies.

Experiments in Spanish Pilots

- 2 years/ 5crops: maize, wheat, poppies, onion and garlic
- 2015:
 - 9 commercial fields of wheat and corn.
 - Extensive soil and biomass sampling work to validate the remote sensing satellite methodology in the description and monitoring of crop cycles, nutrients uptake and characterization of the variability:
 - 812 biomass samples.
 - 3600 soil samples.
 - 500 radiometric and chlorophyll measures.

Implementation of different nitrogen fertilization strategies (farmer reference, high and low) to study the correlation between nitrogen rates and soil productive potential.

- Comparison between harvest monitor maps and biomass productivity maps based on satellite imagery.

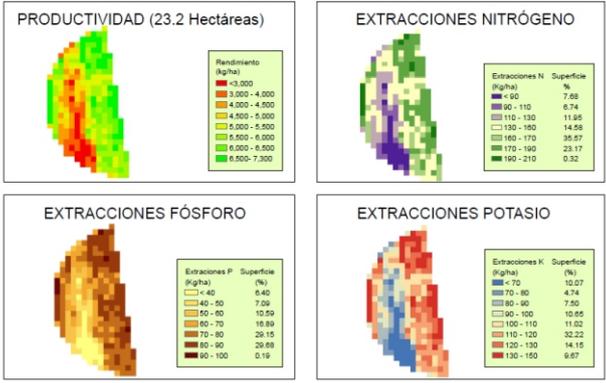




Area Pilot Area Facts & Figures

Two years pilot results

PRODUCTIVIDAD Y EXTRACCIONES TRIGO 2016



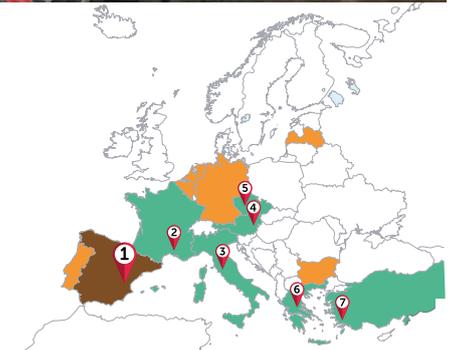
- Farmers are delighted, and rely on it to make their irrigation planning, with our weekly water requirements prediction, based on time satellite imagery and weather model forecasting.
- Validated the correlation between maps obtained with harvester yield monitors and those elaborated with satellite imagery time series.
- The possibility of creating immediately maps of variability of any filed, using historical series of satellite imagery, is allowing:
- Conduct diagnostic (soil sampling...) and crop monitoring work more accurately.
- Make crop nutrients uptake maps for the preparation of plans and decision making on fertilization.
- Farmer expectations about the advantage of VRT have been aroused.

Future Perspective / Regional Impact of FATIMA

- Need to create new job profiles to work in the field by supporting and transferring these new technologies.
- Increasing the use of VRT.
- Water and fertilizers use optimization.
- Improving relationships and communication between farmers and researchers.



Pilots regional team



<http://www.teledeteccionysig.es/>

<http://www.itap.es/>