GREEK PILOT AREA
Thessaly

• The most extensive area of agricultural production in Greece
• Agricultural activity determines economic development of the region
• Agriculture is the major water consumer representing 90-95% of the annual water demand

General Description

- TOTAL POPULATION: 500,000 // OVERALL SIZE: 10,500 km²
- LAND USES: Agriculture 36%, Municipal/communal 23% Forests 19.5%, Private 14%, Other 7.5%
- AVERAGE FARM SIZE: 4 ha
- AGRICULTURAL USE: 450,000 ha // IRRIGATED AREA: 250,000 ha
- ANNUAL RAINFALL: 400 mm // ANNUAL ET: 2.66 mm/day
- IRRIGATION SYSTEMS: Sprinkler 65% Drip 30% Furrows 5%
- MAJOR CROP TYPES: Wheat/Barley (180,850 ha) Cotton (100,500 ha) Orchards (43,200 ha) Maize (20,000 ha)

Experiments in Greek Pilots

- 2 years 3 crops. Summer: Cotton and Corn, Winter: Wheat
- Implementation of a high resolution variable rate (VRT) nitrogen management
- Field-strip design to accommodate machinery
- Monitoring of crop stress, nutrient status and yield
- Monitoring of Water balance to determine irrigation efficiency, ET and leaching potential
- Incorporation of SPIDER webGIS to farm level inputs management
- Supervised classification on satellite WV-2 images
- Comparison of ground sensor and satellite-driven VRT systems

A mechanized variable-rate (VRT) fertilizer application system for site-specific in season nitrogen management is based on the ability of ground-based sensors to detect canopy N content, to translate the spatial information into fertilizer N requirement and to convey a rate signal to a variable-rate spreader for application of granular fertilizer with inter-row precision of placement under real-time conditions. The system is based on sensor and spreader components that are commercially available by independent vendors. But the concept is a prototype because these components have not previously operated together, thus requiring the modification of communication protocols and various adjustments between electronic devices. The high-resolution VRT system is accepted to reduce total nitrogen inputs where maintain yields resulting to environmental benefits and profitability with the least uncertainty for the farmers.
Area Pilot Area Facts & Figures

First Year Pilot Results

VRT system
• On wheat cultivations: On average, VRT system used 72% less in-season N or 38% less total N than that applied by the farmer without any yield losses in a slope wheat farm. VRT system applied more N in areas of lower soil fertility and plant productivity that utilized by plants.
• On cotton cultivations VRT system increase Nitrogen Used Efficiency of Fertilization by 50%

Comparison of ground sensor and satellite-driven VRT systems
• Strong correlation of canopy indexes at farm level from satellite data of WV2 and L8
• Strong correlation of biophysical-biochemical parameters when collected from “neighboring” dates from satellite data of WV2 and field measurements regarding NDVI, redEdge and CI.
• Satellite data can be used as agricultural information source for the VRT machinery deployment

Future Perspective / Regional Impact of FATIMA

• Implementation of new experiments to Corn, Cotton, Wheat cultivations
• Dissemination of the VRT systems, and SPIDER webGIS to stakeholders by
  • Regional meetings
  • Communications with local farmers in experimental fields regions
• Incorporate SPIDER webGIS to the upcoming experiments
• Dissemination of the FATIMA tools to the local farmer community

Country Pilots regional team

http://www.ipsw.gr/en/  
http://redcoast-int.com/  
http://www.gnhm.gr/en  
http://www2.aua.gr/en

VRT system decreased N inputs by 38% without any losses of grain yield in replicated wheat strips

VRT system demonstration to local stakeholders