



WEAM4i

Water & Energy Advanced
Management For Irrigation

WEAM4i Successful Case Studies

Yara Water Sensor - Irrigation scheduling protocols based on plant water status

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Yara Water Solution

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Irrigation scheduling

Why:

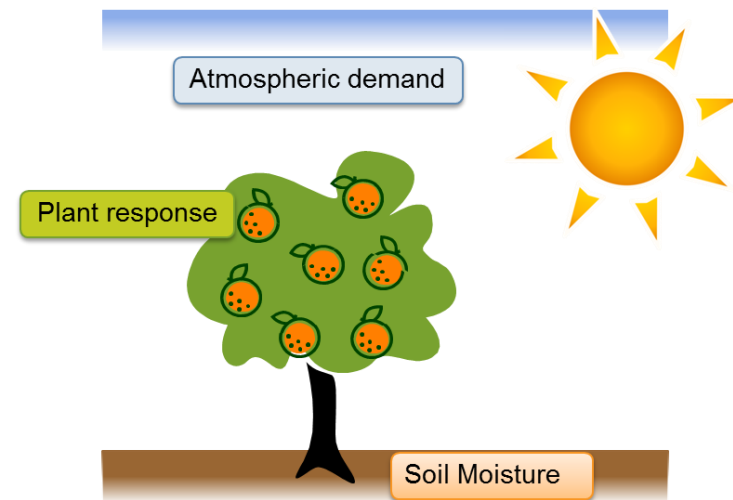
Effective, well timed irrigation is critical for sustainable and profitable production with high yields, good fruit quality and optimum fertilizer efficacy.

The Challenge:

- How much and when to irrigate?

What to measure:

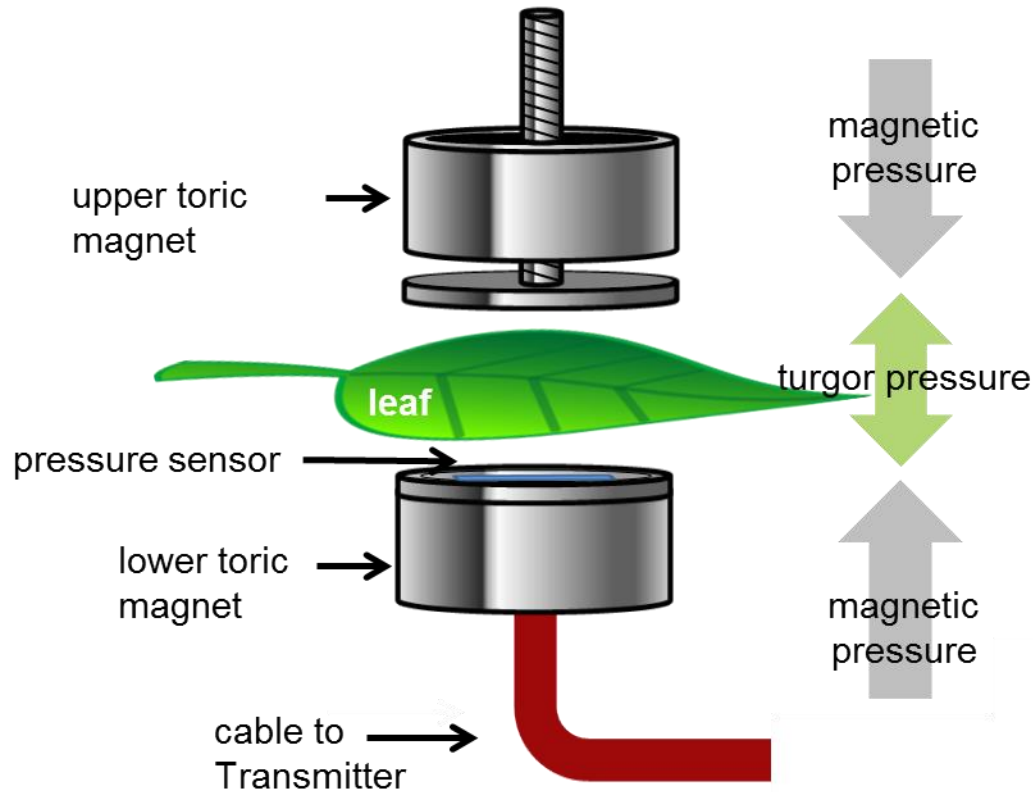
- Atmospheric demand
- Soil moisture
- The plant response



The plant response integrates the surrounding conditions and completes the picture that allows irrigation-on-demand.



Description of the Solution

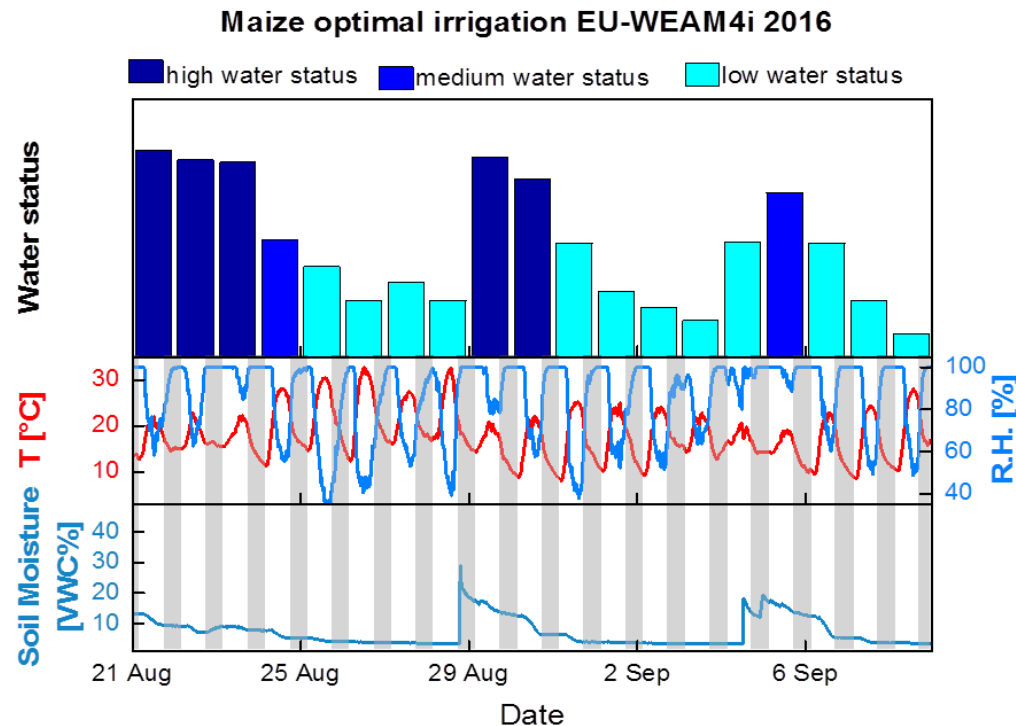


The Yara Water-Sensor measures the difference between magnetic pressure and turgor pressure.



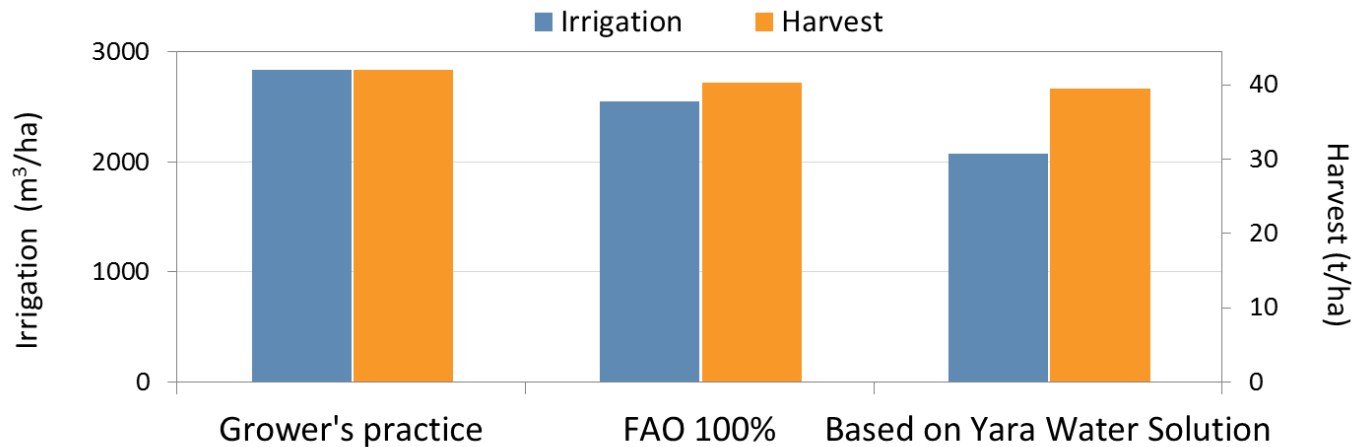
Description of the case study

- The Yara Water-Sensor was tested within this project on persimmon, citrus, maize and potato crops under different environmental conditions.
- Advantages and limitations for the use of these technologies have been identified and algorithms for the interpretation of sensor outputs were derived.



Results

- Changes in plant water status were detectable for all plants.
- Agricultural practicality is difficult for broad-acre crops under overhead-irrigation.
- Creating fully automatic irrigation scheduling from readings made with Yara Water-Sensor needs further integration with other data streams (soil, weather, imagery etc.).
- Based on independent internal Yara open field trials, algorithms for detection of the plant water status was developed and automatic irrigation recommendation for Olive and Citrus can be now created and used to help scheduling irrigation.



Drip irrigated commercial orchard of Navelina orange in Murcia, Spain. Averaged data from 2015 and 2016.

Lessons learned and Market perspective

Overhead-irrigated broad acre crops and areas with positive evapotranspiration are out of scope for now. Based on that the following segmentation for the Yara Water-Sensor could be performed:

Crop coverage:

The Yara Water-Sensor is currently calibrated for **Olives** and **Citrus**. Work is ongoing for additional crops – such as **Grapes**, **Almonds**, **Pome Fruits**, **Stone Fruits**, **Coffee**,....

Focus countries:

Spain, Portugal, US, Brazil, South-Africa, Australia

Farm Size/Type:

- Micro Irrigation
- Large and with business rationale and high tech focus
- Professional Growers who invest in technology; Interested in utilizing technology
- Irrigation Associations driven by optimization of water use and irrigation infrastructure



Key Messages

By implementing the Yara Water Solution it is possible to...

1. Save water consumption up to 20%
2. Save energy
3. Reduce tree maintenance
4. Sustain maximum yield
5. Improve crop quality





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