



Knowledge grows

# Introducing the Yara Water Solution





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The Yara Water Solution forms part of the Farm Management System offered by Yara.

The Yara Water Solution enables farmers to irrigate on-demand and to save 20-30% of water. The Yara Water-Sensor assesses the water status of the crop by measuring the pressure of the leaf, and the irrigation recommendations are accessible via the Premium Engagement portal for Yara – MyYara.

Yara's R&D departments carry out ongoing trial work to improve the current crop specific calibrations and to develop the technology for other crops.

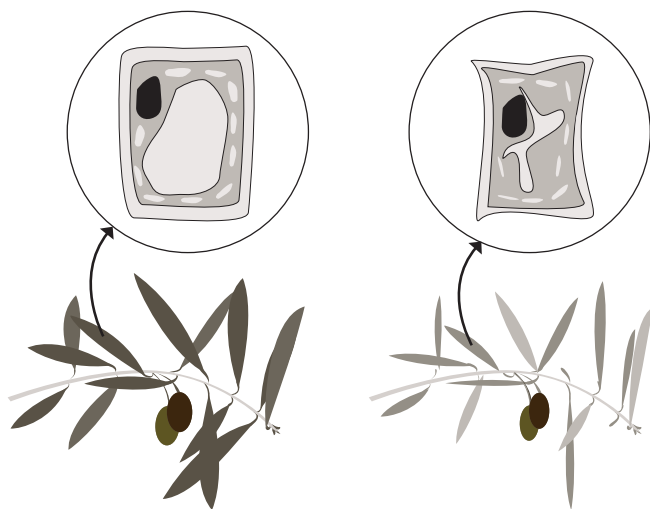
The result? Water and energy savings, reduced tree maintenance, and sustained maximum yield.



## How Does the Yara Water Solution Work?

With increased water scarcity and agriculture consuming 70% of the global freshwater resources, the demand for new agricultural solutions keeps growing. Precision agriculture / crop sensing technology increases nutrient and water use efficiency.

Yara has developed a continuous, non-destructive and remote measurement of plant water status in real time via the Internet. This allows you to apply water on demand to optimize the resources, while maintaining production quality and quantity.



### Crop Coverage

The Yara Water Solution is currently available for:

- Olives
- Citrus

The irrigation recommendation given by the system is crop specific and validated.

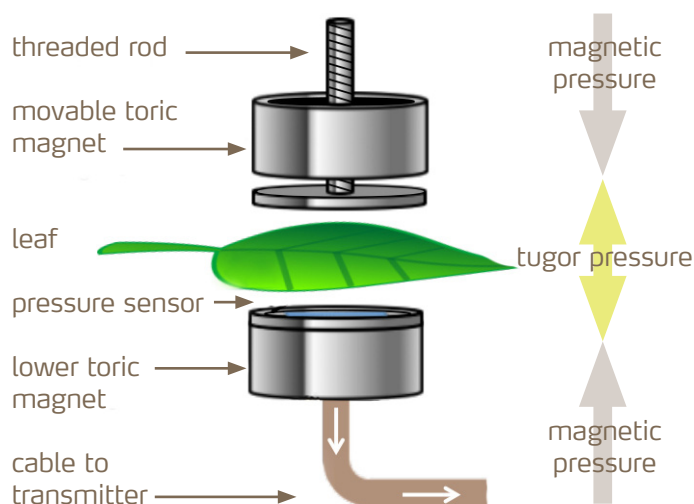
Work is ongoing for calibrations of additional crops such as:

- Pome Fruits
- Stone Fruits (incl. Almonds)
- Grapes

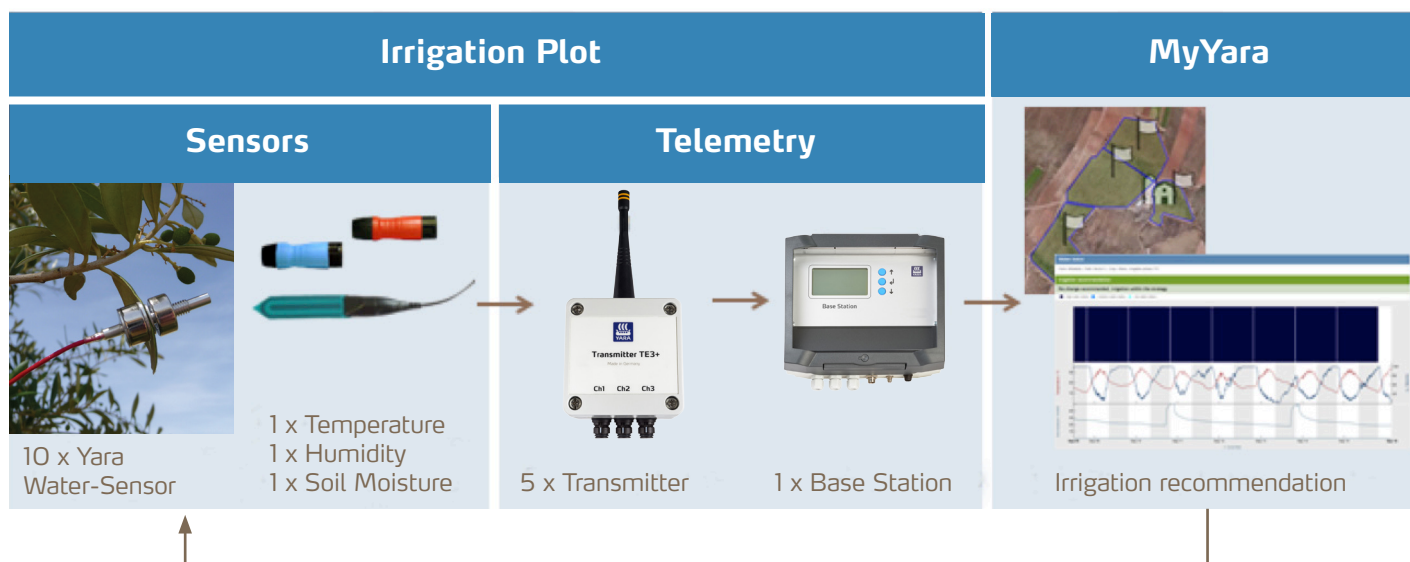
The Yara Water-Sensor measures the relative changes in the leaf's turgor pressure together with other microclimate parameters. Turgor pressure is the pressure caused by fluid pushing against the cell wall of plant cells. It is needed to keep the plant's rigidity, to stand straight and continue normal cellular functions. As the turgor pressure is the driving force for plant growth and fruit production, proper water management is important. If a plant is not able to access enough water, it cannot maintain turgor pressure and it will begin to wilt.

The Yara Water-Sensor measures changes in leaf turgor pressure in real time. The turgor pressure in the leaf patch is opposed to the magnetic pressure, which is kept constant during the measurements. The Yara Water-Sensor measures the difference between magnetic pressure and turgor.

The Yara Water Solution uses a minimum of 10 Yara Water-Sensors, distributed across 5 trees in the sector, for safety and representativeness; this ensures continuous measurements reflecting the reality of the sector. The Yara Water Solution also includes sensors to measure the microclimate parameters used to complete the evaluation and irrigation recommendation for the sector, keeping the user informed of the environmental situation at all times.



## Basic elements of the Yara Water Solution



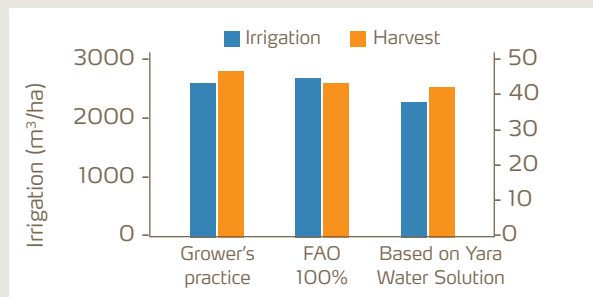
The information/data are sent wirelessly in real-time to Yara's premium engagement portal, MyYara. The data is then run through a calculation tool which interprets the information and provides a water application recommendation. Based on the actual Yara Water-Sensor readings and our calibration trials, the crop water status and the crop-specific irrigation recommendations are now accessible via desktop, laptop, or smart phone using a standard web browser.

## Benefits

- Save water consumption up to 20-30%
- Save energy
- Reduce tree maintenance
- Sustain maximum yield
- Improve crop quality

## Example

The Yara Water Solution for citrus - up to 20% water savings during the period of maximum demand (from June until October) - same yield.



*Drip irrigated commercial orchard of 'Navelina' orange in Murcia, Spain.*



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This device has to be used exactly according to the instructions of the manual as the measurement of a visco-elastic pressure response shall be avoided. The device will result in false measurements, if used for measuring visco-elastic pressure response of a plant.



## About Yara

Yara's knowledge, products and solutions grow farmers', distributors' and industrial customers' businesses profitably and responsibly, while protecting the earth's resources, food and environment.

Our fertilizers, crop nutrition programs and technologies increase yields, improve product quality and reduce the environmental impact of agricultural practices. Our industrial and environmental solutions improve air quality by reducing emissions from industry and transportation, and serve as key ingredients in the production of a wide range of goods. We foster a culture that promotes the safety of our employees, contractors and societies.

Founded in 1905 to solve emerging famine in Europe, today, Yara has a worldwide presence, with close to 13,000 employees and sales to about 160 countries.