REGIONE PIEMONTE

WAPPFRUIT

PSR 2014-2020

EAFRD

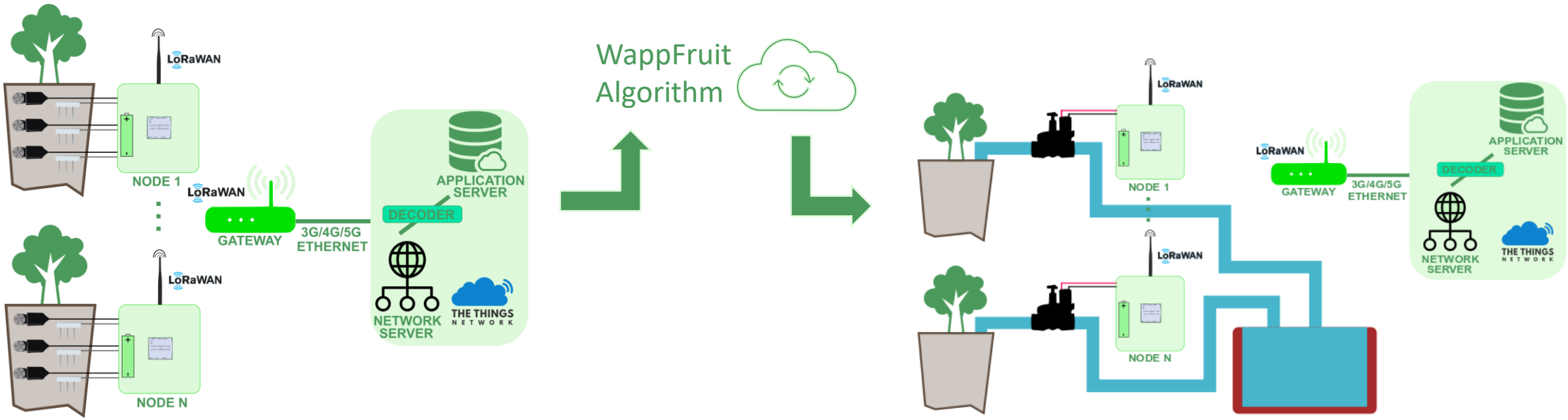
European agricultural fund for rural development

WAPPFRUIT - Smart technologies applied to water management in fruit growing

Aim

The regional project WAPPFRUIT is focused on the design and deployment of a smart irrigation system for water irrigation in orchards specifically for apple and kiwi trees

Keywords: Farming Practice; Soil Management; Water Management.



REGIONE PIEMONTE

Operational Group (GO)

WAPPFRUIT

Politecnico di Torino - DET

Università degli Studi di Torino - DIST

Agrion – Agriculture Research Center

Az. Agricola Vassallo – Farm

Az. Agricola La Marchisa – Farm

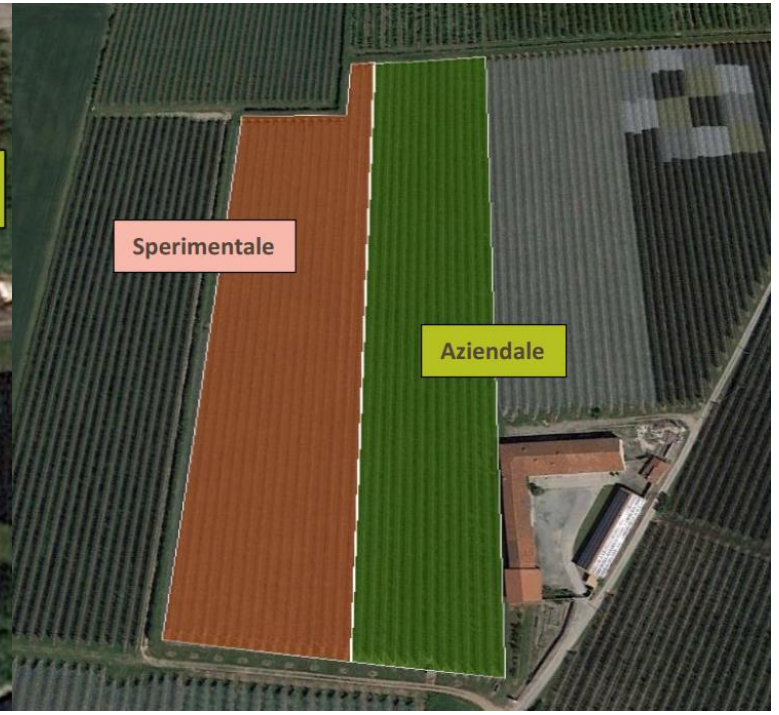
Az. Agricola Sacchetto – Farm

Astel – Company

Orchard fields

Az. Agricola Sacchetto

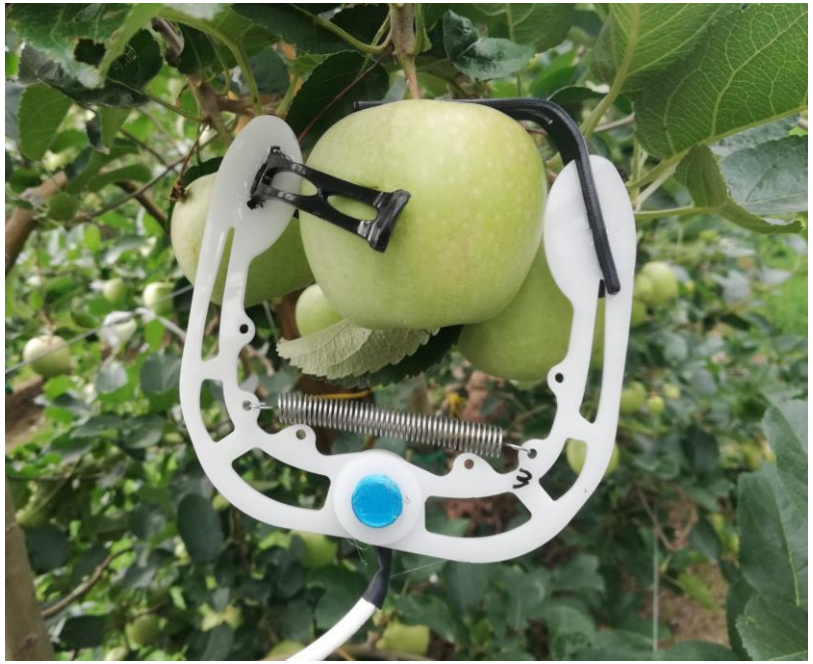
Az. Agricola Vassallo



Az. Agricola La Marchisa

Fruits characterization

Fruitmeters have been used in the orchards to evaluate fruit growth.



Apple

Crimson snow and Galavan varieties

Actinidia

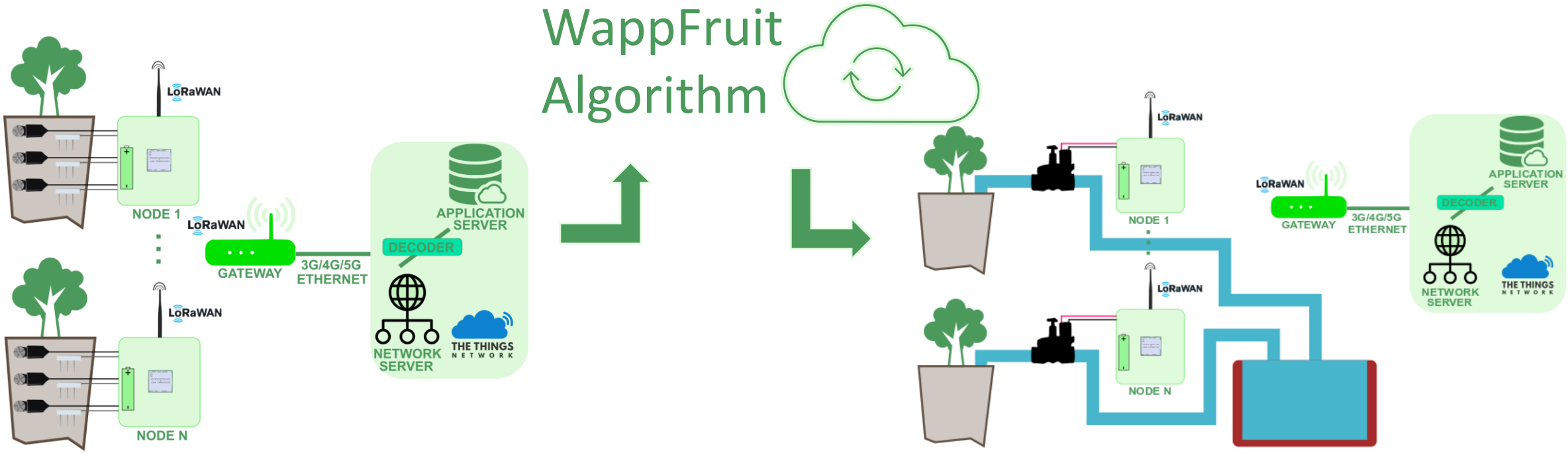
Hayward variety

Orchards characterization

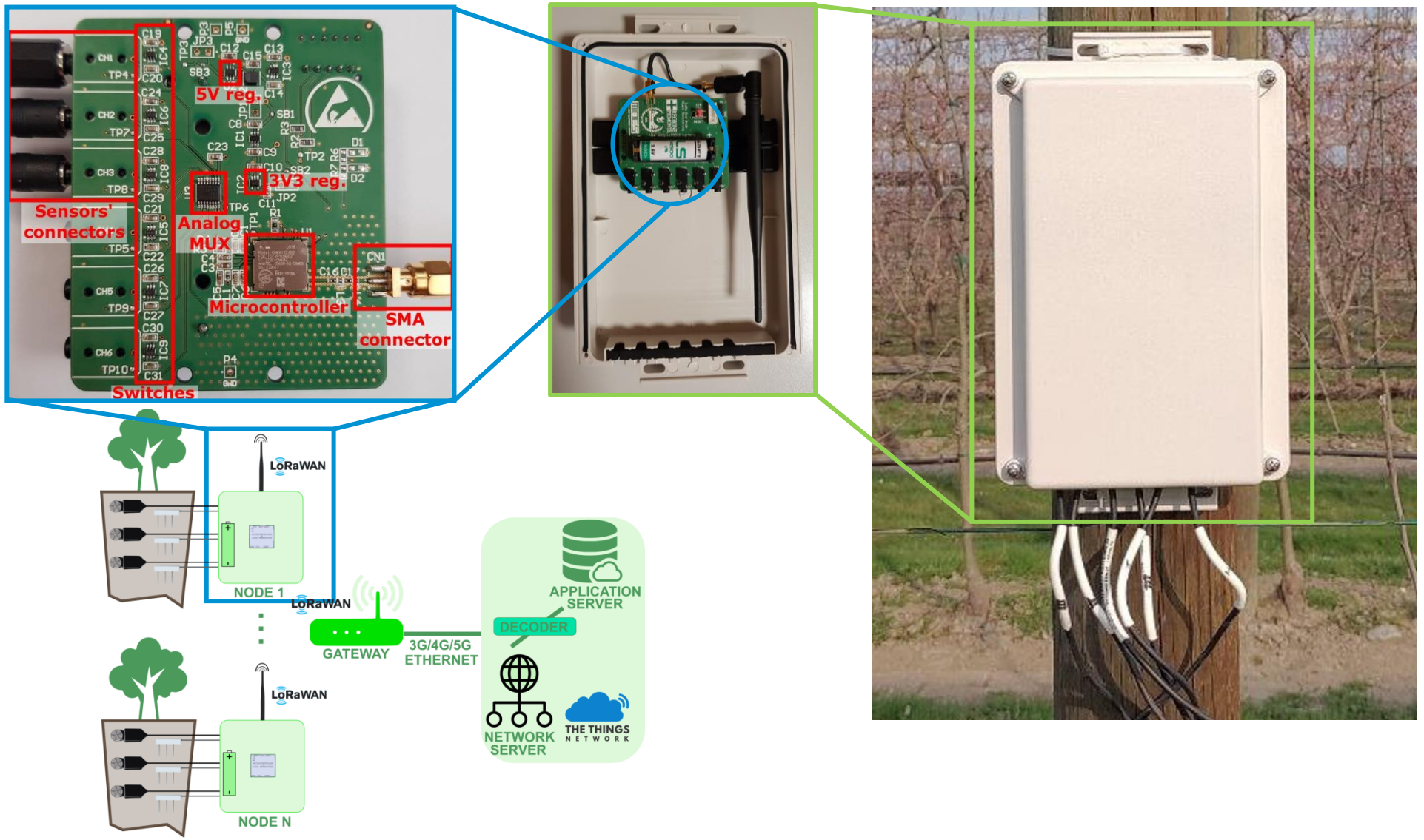
Dendrometers have been used in the fields to estimate tiny diameter variations of tree trunks

Dendrometer on an apple tree

Project elements



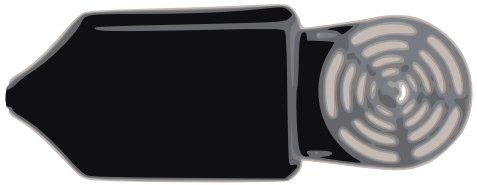
Measuring node



Adopted sensors

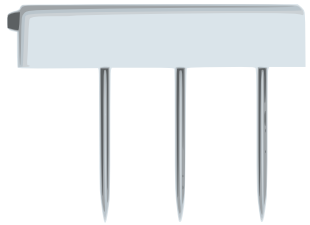
Soil matric potential

- TEROS21 by METER GROUP
- estimates the water content of a porous ceramic matrix that equilibrates with the soil

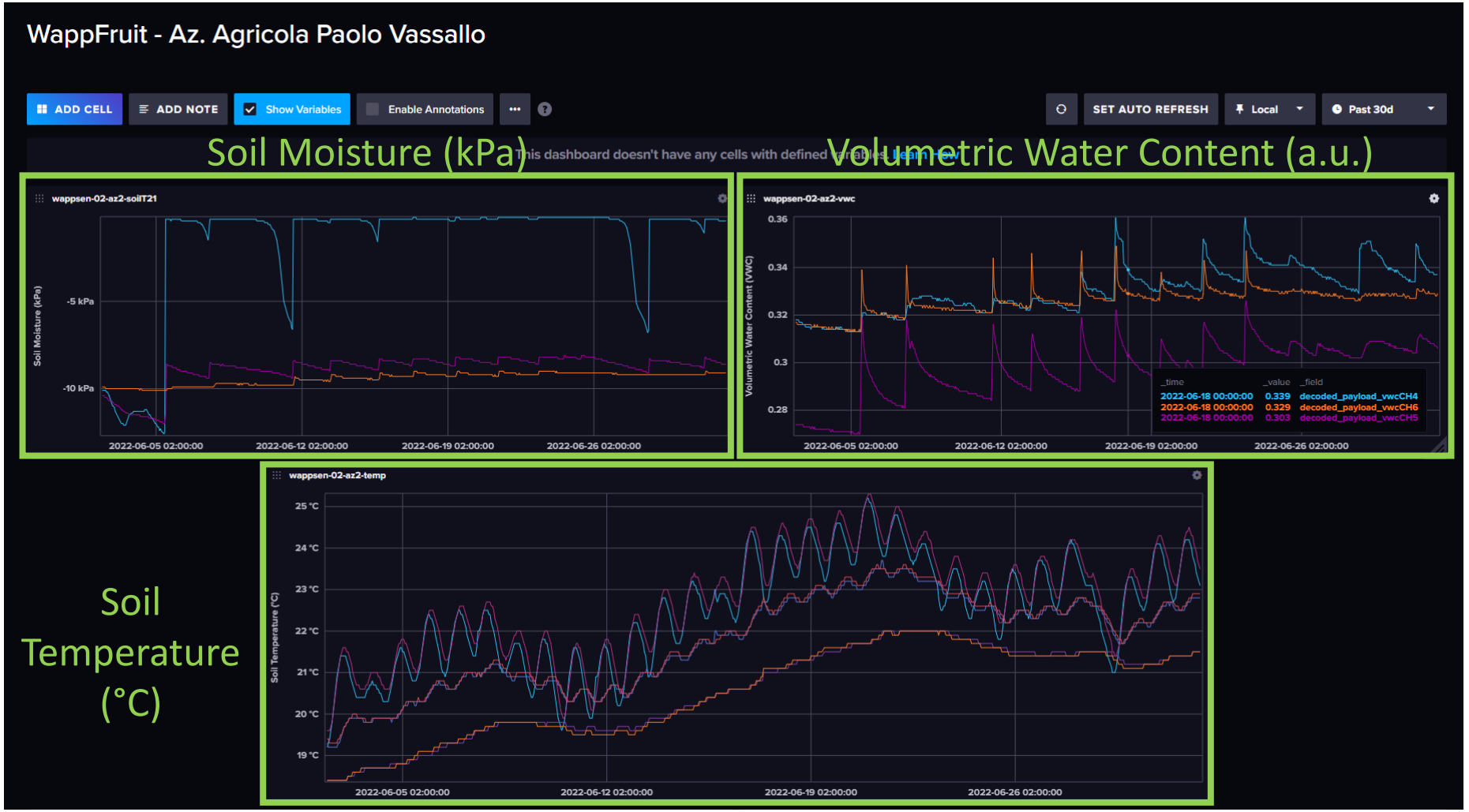


Volumetric water content

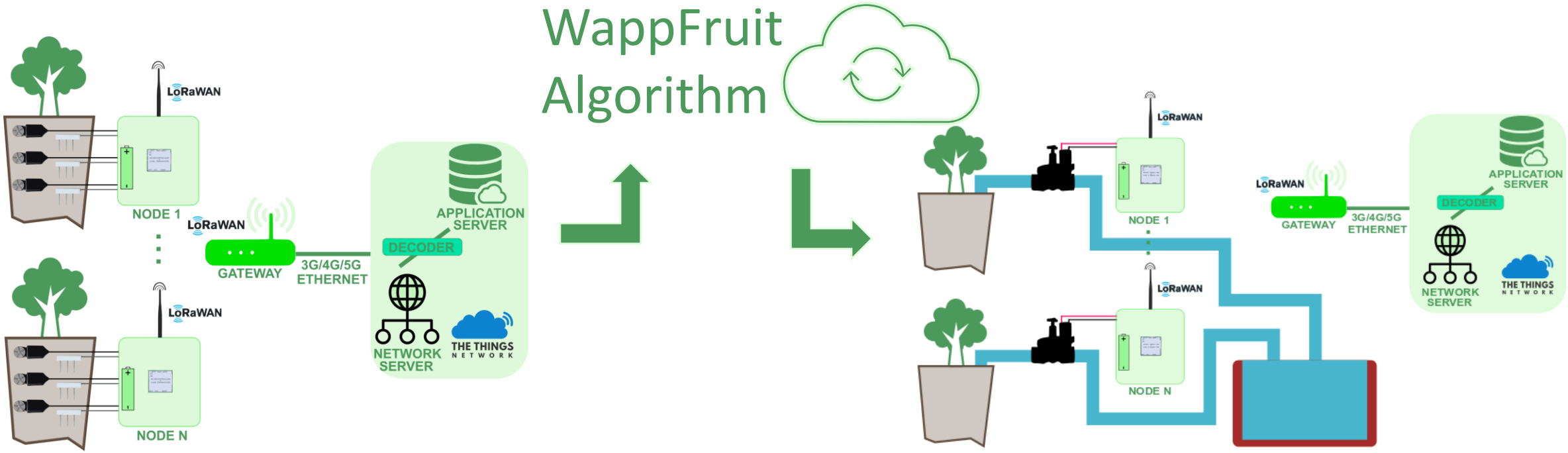
- TEROS11 by METER GROUP
- monitors the soil permittivity and measures the Volumetric Water Content



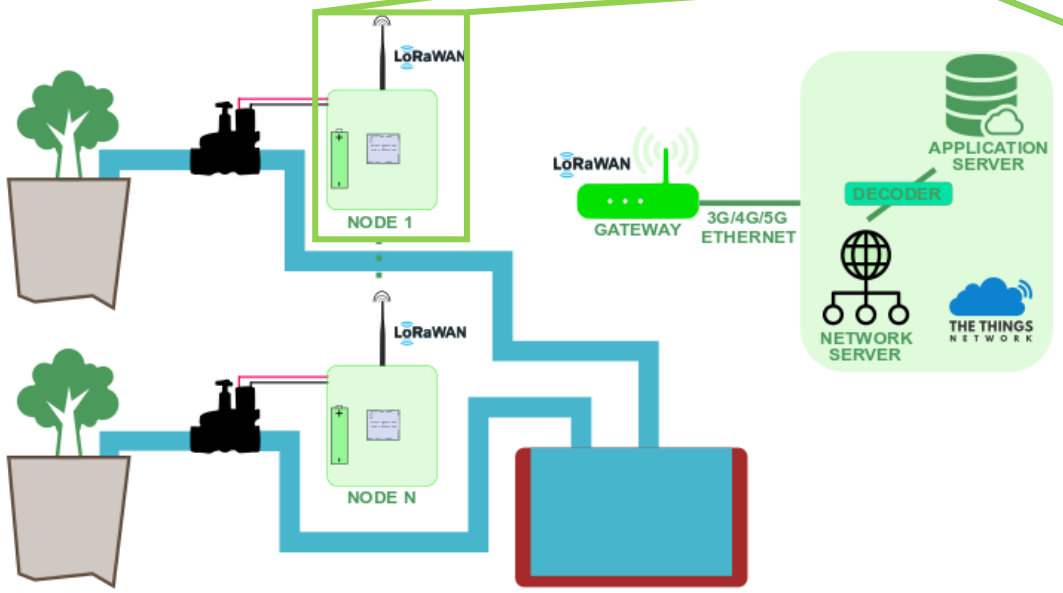
Graphical User Interface



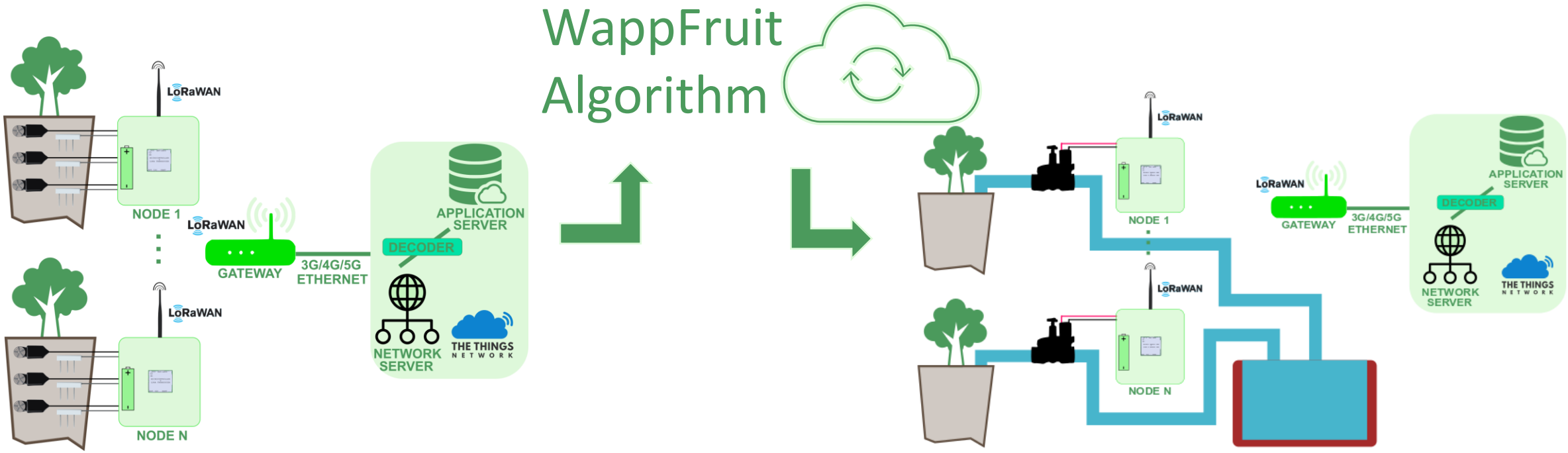
Project elements



Actuation node



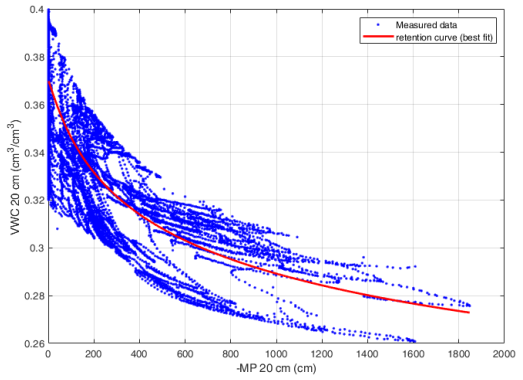
Project elements



Irrigation algorithm

WappFruit Algorithm

Data acquired from sensors



Water retention curve

Irrigation thresholds definition

Automatic irrigation pattern based on live sensor data

Thresholds definition is specific to the soil and cultivation properties, to give the exact quantity of water needed by the plants

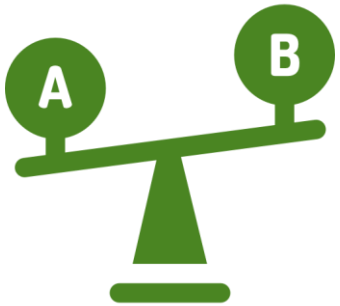
WappFruit in 2022

Water scarsity in 2022

To avoid potential problems we decided to disconnect automatic irrigation in 2022, leaving also experimental fields to the farmers

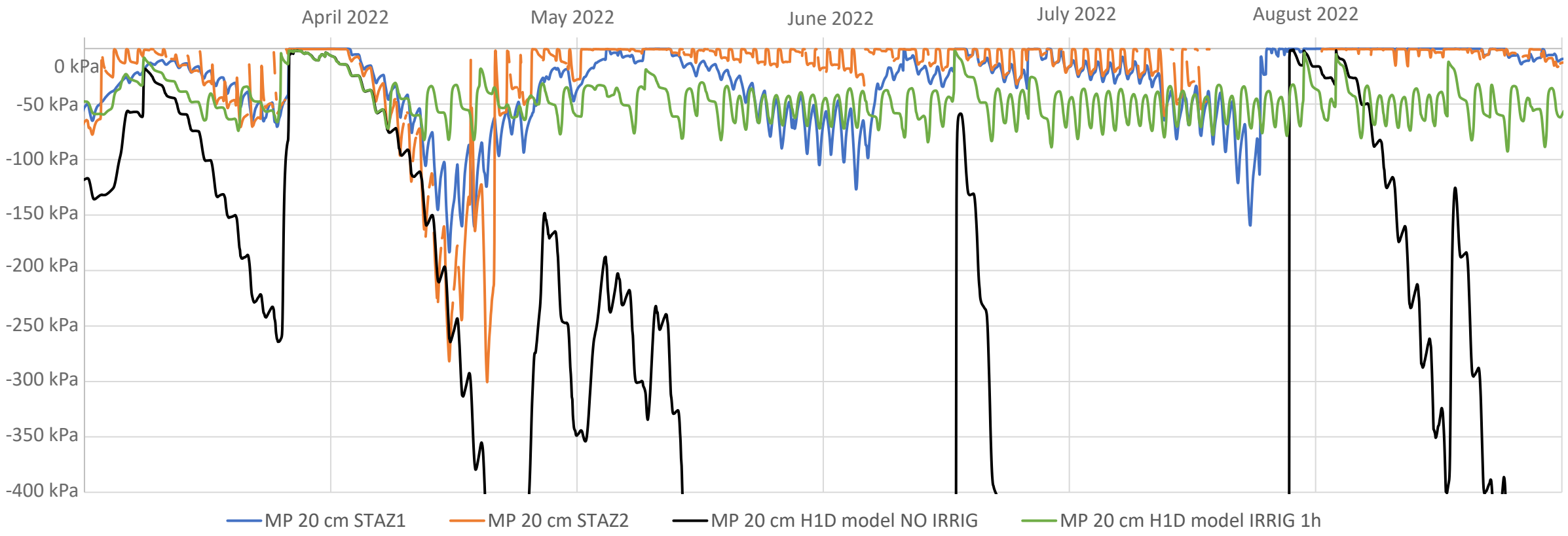
Data acquired from sensors

Simulate the irrigation scheduling



Our watering predictions were compared with the one adopted by the farmers

WappFruit in 2022



Interesting outcomes

The farmer adopted a conservative irrigation scheduling, expecting a potential loss in the production.

Fruit quality and quantities were good: average fruit diameter was 78mm, when the expect value for a good production is in the 75-80mm range

Farmer irrigation was **825mm** (below normal) while our prediction was **868mm (~5%)**

WappFruit in 2023

Farmers will manage a portion of the field

We will control the other portion

Final results will be compared considering fruit quality and water usage

REGIONE PIEMONTE

WAPPFRUIT

Thank you for your attention!!

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