life from cosmos
finapp

Tobacco

The best Irrigation Strategy for tobacco cultivation

The measurement of water content in the soil to increase productivity in agriculture

Experience

The **PAU** (useful agricultural product) of tobacco consists of the leaves, which are dried using special procedures (cures). Each variety of tobacco plant has a different type of leaf, whose peculiar characteristics make it more or less suitable for sale and appreciable by the enduser.
Knowing these characteristics is very important for the growth of tobacco. Tobacco grown under water shortage, not only loses in quantity but is also subject to strong biochemical and physical changes that reduce its quality.

Leaves in care, yield water with difficulty, prolong their life span, take dull coloring tending to gray.
The irrigation strategy to avoid water stress in the plant becomes decisive, and must take place before the plant reaches the wilting point and with sufficient volume to restore the soil to the field capacity Higher water inputs cause wastage and root asphyxiation.

Name
Tosato Farm

Location
Oppeano (VR)

Study validation
PhilipMorris Italy

Colture
Tobacco

Irrigation
Flood

Use

In order to evaluate the state of the art in soil water content monitoring technology, a Finapp CRNS probe was installed to monitor soil moisture in areal no-contact mode and in real time in a tobacco's plot at a reference farm in the sector, which has been operating for over 20 years.
The irrigation strategy remained the responsibility of the farm, which at the end of the season has analyzed the yield and quality of tobacco from two neighboring plots, one managed with irrigation based on CRNS Finapp monitoring sensor, the other monitored with automatic software based on weather algorithms and manual punctual measurement with a TDR probe.
In the reference seasons (2021, 2022) and following the comparison between the two neighboring plots, it emerged that the 5 hectares irrigated and monitored using Finapp CRNS probe, have provided a greater and also qualitatively better yield than the surrounding 5ha managed by the TDR probe and the automatic system.

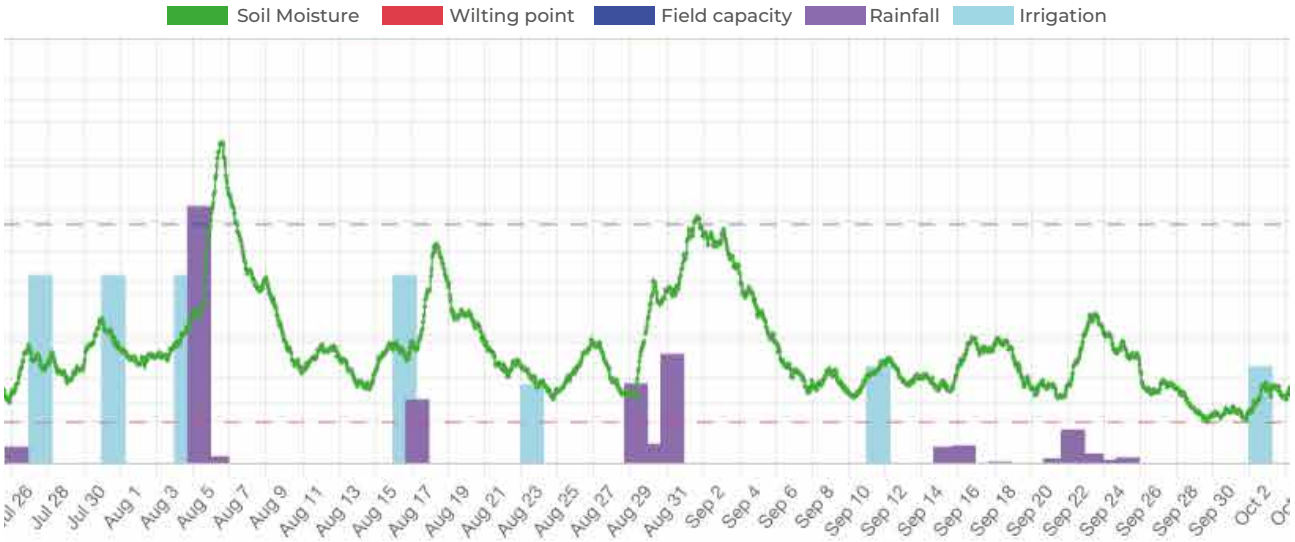
	Yield	Quality
finapp	+12%	+17%

*It is the average selling price of tobacco.

12% higher yield* than hectares irrigated with IA models (second method)
**The value is calculated by weighing the tobacco during the harvest and then after drying it.*

The **quality* of the product improved by 17%** compared to that one harvested in the field cultivated with AI.
**As assessed by PMI*

The exact evaluation of soil moisture is one of the pillars on which to build an appropriate irrigation strategy for tobacco cultivation. Today, These approaches have technological limitations, reason why irrigation has often been based on the experience of professionals rather than on real measurements.
The CRNS technology available today has been proven to be ideal for optimising production and in choosing the best irrigation strategy.



In figure:

- Soil moisture
- Rainfall
- Irrigation
- Field capacity: threshold set by the agronomist
- Wilting point: threshold set by the agronomist

Benefits

• Continuous quantitative measurement (kg/kg) and/or volumetric (m3/m3).
• Monitoring of medium/large areas, over 5 ha, approx. 125 metre radius in lowlands.
Insensitivity to soil salinity, bulk density , texture and surface roughness.
• Indicates when is the best time to irrigate crops according to agronomic and operational parameters
• Optimize water resources by allowing you to irrigate in the right place, at the right time and saving water
• Decreases product losses
• Reduces water and energy consumption by avoiding waste

"Finapp allows you to do the right thing at the right time!"
" I always had the feeling that the soil moisture data given back by the punctual probes were not accurate: I used to spend a lot of time doing " surveys " by hand at various points in the plot to evaluate soil moisture in depth. With Finapp, for the first time in over 20 years, my feelings were verified by measured data".
These are the words of Marco Tosato, owner of the homonymous company.

Tosato Marco e Alberto' Farm

The farm managed by the Tosato family is historically one of the reference farms for this crop and is part of the tobacco-growing district, in the Veneto region which is mainly concentrated in the province of Verona.

The CRNS Finapp technology

Finapp's CRNS technology relates the count of cosmic neutrons striking the soil, with the hydrogen atoms and thus the water content in the soil. Finapp provides the measurement of soil moisture in a unique way:

- **No-contact: no need for sensors installed in the soil**
- **Area measurement: approx. 5 hectares, a radius of approx. 125 meters**
- **In depth: approx. 30-50 cm in the soil**
- **Continuous: 24/24h, 7/7 days**
- **Not influenced by structures or artefacts**
- **The type of soil does not influence the measurement**
- **Does not interfere with agricultural daily working routine**
- **Less energy consumption thanks to solar panels and no connection to the grid**
- **Data is just a click away on PC, smartphone, tablet, offering an intuitive user interface, clear graphics and the possibility of downloading all numerical values.**
- **Optional information such as DSS (irrigation decision support) is available or can be integrated, as well as meteorological data, data from other sensors, etc.**

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Via del Commercio, 27
35036 Montegrotto Terme PD - Itay

+39 0490991301
info@finapptech.com
www.finapptech.com

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