AI for irrigation management in Trentino

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IRRITRE: the project for the development of an integrated public local information system

The [IRRITRE](#) project was created with the aim of revolutionizing irrigation management in Trentino, a region characterized by a fragmented irrigation system and small farms. With more than 200 irrigation consortia operating in the region, irrigation scheduling is often based on empirical criteria, while most crops, especially apple orchards and vineyards, already use advanced techniques such as drip irrigation.

Coordinated by the Autonomous Province of Trento, together with Fondazione Bruno Kessler, the project involved Fondazione Edmund Mach – Italy and Trentino Digitale S.p.A.

IRRITRE aims to address these challenges through the development of an **integrated public local information system,** the use of innovative technologies and the validation of results in three representative pilot sites: apple orchards in Tres (Val di Non), vineyards in Roverè della Luna (Val d'Adige) and olive groves in Varone (Lake Garda).

The IRRITRE platform integrates **Internet of Things** (IoT) technologies, **artificial intelligenc**e (AI) algorithms and **advanced predictive models**. Sensors in the field **monitor key parameters such as soil moisture, irrigation flows and weather conditions**, while AI algorithms process this data to provide optimal irrigation recommendations. Tools developed include dashboards and spatial maps for real-time monitoring and long-term planning.

Trials at the Roverè della Luna pilot site with the winery of the same name have already produced extremely positive results:

- **Water and energy savings:** adoption of the system has led to a reduction in irrigation consumption of between 20% and 50% (depending on specific production targets), accompanied by equivalent energy savings thanks to more efficient resource management.
- **Grape quality**: despite the reduction in water used, there was no loss in the quantity of grapes produced. Laboratory analysis and microvinifications showed that the quality objectives were maintained, in terms of sugar content, color intensity and presence of aromas.
- **Sustainability and productivity**: the project demonstrated how it is possible to optimize the use of water resources without compromising productivity, contributing to more

sustainable and profitable crop management.

The IRRITRE project represents an innovative and replicable model for more efficient, sustainable and technologically advanced irrigation management.

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