



GREEN INFRASTRUCTURE IN WINE-GROWING LANDSCAPES

Nature-based solutions and recommended
best practices in vineyards

Identified problem:

Climate change is causing water stress problems in many vineyards, making it difficult to secure the water needed for growth and production. As irrigation becomes increasingly necessary, proper water management is essential to avoid waste and yield loss. Irrigation too early leads to unnecessary water waste, while irrigation too late can reduce vine growth, vigour and grape quality (lower sugar content).

Best practice recommended by ECOSPHEREWINES: EFFICIENT WATER MANAGEMENT

Implementing a **precision irrigation system** reduces water waste and drought impact, while ensuring water is delivered at the right time, tailored to the vineyard's conditions and the demands of the vine. The installation of soil moisture sensors and smart drip irrigation systems allows the water status of the plant to be maintained and prevents any significant stress until harvest, even in areas affected by climate change. When properly managed, they provide **diverse** environmental, social, economic, and cultural **benefits**, commonly described as **ecosystem services**.

How can this best practice be implemented?

- 1. Choose the irrigation system:** the most efficient systems are **overhead drip** irrigation, widely used for its uniformity and precise control, and **buried drip** irrigation, which delivers water directly to the roots and allows for greater water savings. If traditional irrigation systems are already in place on the plot, consider restoring and utilising them.
- 2. Know the water status of the soil: soil moisture sensors** allow irrigation to be adjusted based on objective measurements. In addition, winegrowers have additional tools at their disposal to decide on the optimal time for irrigation, such as leaf water potential, carbon-13 isotope discrimination (a global indicator of water scarcity) and observation of stress symptoms at the tips of plants, among others.
- 3. Characterise the evolution of soil water status:** in addition, **water restriction models** based on meteorological data (rainfall and evapotranspiration), together with soil and plant characteristics, provide a better understanding of how soil water availability evolves throughout the season, helping to optimise irrigation control.

What ECOSYSTEM SERVICES does efficient water management provide in vineyard landscape?

- **Regulation:**
 - Maintenance of soil fertility and water regulation and sanitation.
 - Humidity control and thermal regulation, generating microclimates favourable to cultivation.
 - Natural control of pests affecting the vineyard.
- **Cultural:**
 - Conservation and maintenance of the cultural and tourist heritage of the vineyard, especially by adapting traditional irrigation systems, improving landscape management and maintenance.



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