

# WineWATERFOOTPRINT: sustainable use of water along the wine chain

Together, researchers and winemakers are seeking solutions for sustainable water management in wine-growing regions of the Mediterranean



Climate change and water scarcity have prompted concerns for the wine-growing regions of the Mediterranean, due to the strong impact that they have on vineyard productivity and wine quality. In Portugal, the predicted less precipitation, higher soil and air temperature, and the greater frequency and duration of extreme climatic events, may require the moving of vines to higher elevations, or a northward shift of grapevine

varieties. Nowadays, these climatic events are already limiting wine production in southern vine regions, particularly in Alentejo, which led to the expansion of the irrigated grapevine that now represents around 20% of the cultivated area.

## What is the water footprint?

The water footprint (WFP) is an indicator of the fresh water resources needed to produce a unit of a product. WFP identifies the volumes of consumed or polluted water; blue WFP refers to surface and groundwater resources, green WFP to effective precipitation and grey WFP to pollution, expressed as the volume of freshwater needed to assimilate the load of pollutants and to re-establish natural concentrations.

## Who are the partners of the WineWATERFootprint project?

The WineWATERFootprint is a consortium project comprising Portuguese stakeholders, four

research institutes and one technological centre who share tasks and responsibilities, including:

- Instituto Politécnico de Santarém;
- Instituto Politécnico de Beja;
- Instituto Politécnico de Bragança;
- Instituto Nacional de Investigação Agrária e Veterinária (INIAV), Dois Portos; and
- Centro Operativo e de Tecnologia de Regadio (COTR), Beja.

This research team has multidisciplinary skills, including experts in viticulture and precision agriculture, oenology, hydrology, plant physiology, environmental engineering, business management and multimedia.

The WineWATERFootprint project pretends to evaluate cross-cutting broad-spectrum technologies to:

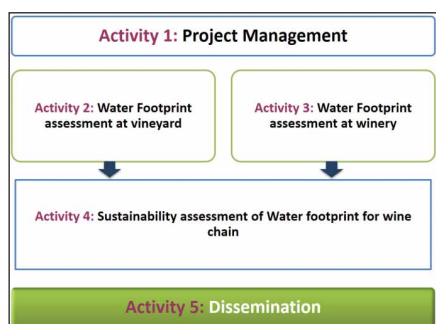
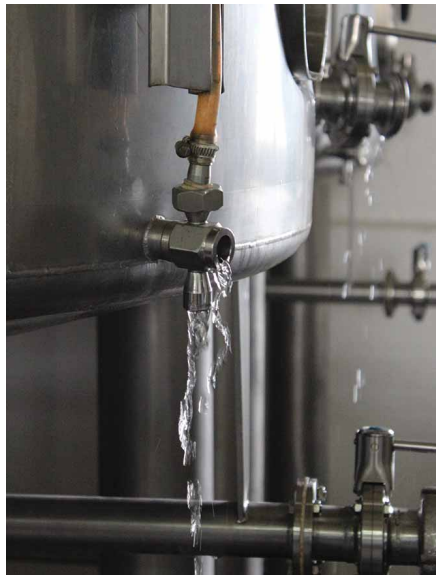


Fig. 1 Wine WATERFootprint activities



- Reduce water demand;
- Assess the uniformity of water distribution and application efficiency in vineyards; and
- Determine water use during wine production.

The assessment of water footprint sustainability will allow the consortium to identify hotspots and define strategies to reduce water footprint by 10%.

### Management tools in the winery

Technically, in some industries, WFP can be reduced to zero by closing the cycle. Lean methods are a powerful means to improve water efficiency and reduce water footprint. Kaizen

events, standard work, visual controls, 5S and total productive maintenance, represent some of the practices that industries could integrate with later initiatives for reducing costs, saving time and improving water usage.

### Precision viticulture strategies

With regard to agriculture, WFP can be optimised by increasing water productivity in a smarter way, using precision viticulture strategies. Remote sense techniques allow us to estimate spatial patterns in crop biomass, vegetative vigour and yield, using vegetation indices. These indices can be correlated with the structural or physiological characteristics of the vine and with the grapevine water status.

The reduction of grey WFP can be achieved by differentiated fertilisation and pesticide applications, and the reduction of blue WFP by defining differentiate vineyard irrigation zones.

### Knowledge transfer

A wine WFP calculator will be accessible to wine growers and winemakers and will provide information on the contribution of each practice and operation to the green, blue and grey WFP. The WFP model has a web-based user-friendly interface for the integration of data collection and practices, in order to estimate the WFP and compare it with standards or results from previous years.

Cofinanciado por:

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