

PORTUGAL

Increasing efficiency in water use by agriculture

Location
Alentejo

Programming period
2014 - 2020

Priority
P5 – Resource efficiency & climate

Measure
M10 – Agri-environment-climate

Funding (EUR)
Total budget 34 363
EAFRD 29 209
National/regional 5 154

Project duration
2015 – 2019

Project promoter
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A company that produces wine and olive oil developed a strategy to improve its water use efficiency and receives AECM support for its water-saving agricultural good practices.

Summary

Herdade do Esporão, located in the Alentejo, south of Portugal, produces quality wine and olive oil. The company follows an integrated management policy guided by social, environmental and economic sustainability objectives.

In 2013, it started developing a strategy to improve the efficiency of its resource use, particularly irrigation water to save resources and improve production quality.

Since 2015, the company receives support for the efficient use of water in agriculture from the RDP's agri-environment Measure. It has implemented an action plan that involved a geological study of the plots, redefining the irrigation plans and installing irrigation monitoring and controlling equipment.



Results

Water consumption reduced by around 1200 m³ of water/ha/year, equating to an overall decrease of 12.7% between 2015 and 2016.

Irrigation can be adjusted according to the weather conditions and age of the plants.

Less waste of water, as losses from the irrigation system have been minimised.

Wine production has less fluctuations both in quantity and quality as water stress of the plants are better controlled.

Lessons & Recommendations

- Continuous information and large volumes of data are crucial to achieving water use efficiency. However, such amount of information needs to be well handled in order to be manageable.
- Human resources and teamwork played a vital role during the fieldwork.
- Developing and sharing a strategy with partners, including universities and research centres, so that they could all exchange knowledge and information, contributing towards the same objectives, was a key element in the success of the project
- Continuous training to update knowledge is always necessary in such a technical field of work.

Context

Herdade do Esporão owns 646 ha of vineyards and 88 ha of olive groves located in the Alentejo, south of Portugal. The company is committed to agricultural practices based on good environmental management, including reduced use of agricultural inputs, and re-use and recycling of production residues and resources. While the olive grove was already organic, the vineyard is gradually being converted to organic production.

To make more efficient use of its resources, the company decided to develop a strategy for saving water. Specific irrigation problems were diagnosed in the vineyards, including lack of knowledge on how to adapt the irrigation systems to different soil types, non-appropriate irrigation patterns and water losses due to runoff. In 2013, a strategy was defined to overcome these problems.

Objectives

The overall objective of the intervention was to improve the economic and environmental sustainability of the production system by pursuing the following specific objectives:

- decrease the annual fluctuation of the quality and quantity of grape production;
- improve the efficiency of resource use;
- improve the irrigation system; and
- increase water and energy savings.

A key element of the strategy was to consider the needs of the different grape varieties used for the production of the six types of wine produced by the company - namely high-quality red and white wines, medium-quality red and white wines, red wine in volume, and young wines.

Activities

A geological survey of the soil of the vineyard helped adjust the irrigation system according to the type of soil and to the type of wine to be produced. The project installed a weather station and sensors to monitor the moisture of the soil and the humidity of the plants.

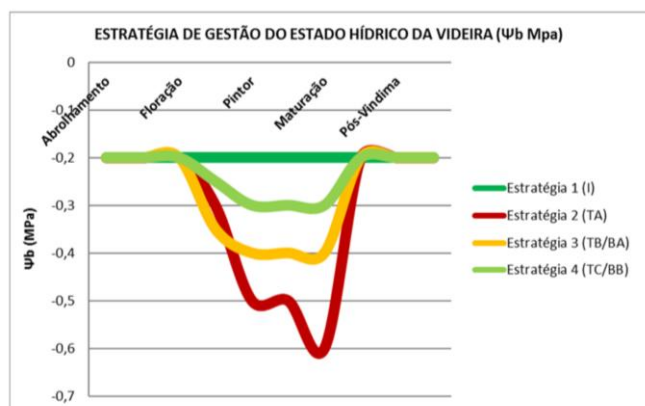
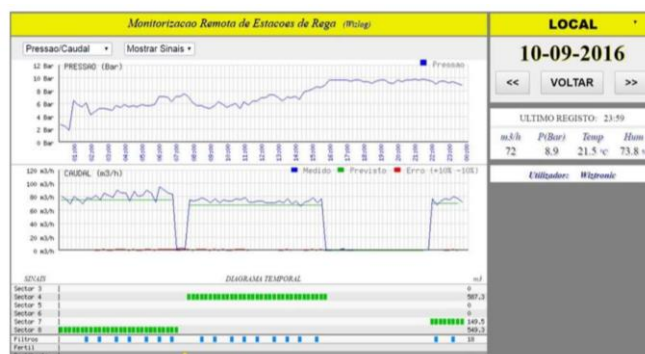
The water pressure in the irrigation system is continuously adjusted according to the weather conditions and plant needs, and flow gauge regulators were installed at the exit of the pump station.

Filter stations control for leaks, whilst the drip test tubes are checked annually to avoid water losses.

Kaolin material is used to cover the leaves and protect them from summer heat stress, thus increasing the water maintained by the foliage.

Since 2015, the company receives agri-environmental support for the efficient use of water in agriculture, under the 2014-2020 Portugal-Mainland RDP. The company complies with a set of commitments, including a minimum of 7.5% in savings in water consumption per year which is cross-checked against a reference set of irrigation data. The control is carried out by a certified entity.

In order to achieve water use efficiency the company worked in partnership with universities and research centres. These provided technical advice on the installation of the water consumption monitoring equipment, conducted research and suggested innovative solutions, and provided continuous training.



Main results

- Wine production is carried out with less fluctuations both in quantity and quality as there is better control of the water stress of the plants.
- Lower water consumption by an average reduction of around 1200 m³ of water/ha/year. This compared to the reference value of 3028 m³ of water/ha/year, shows a decrease of 12.7% between 2015 and 2016.
- Irrigation can be adjusted according to the condition and age of the plant.
- Less waste: more control of the irrigation and this prevents losses from the system.

Key lessons

- Continuous information and large volumes of data are crucial to achieving water-use efficiency. However, this amount of information needs to be well handled in order to be manageable.
- The exchange of knowledge and information would not have been possible without the collaboration with universities and research centres.
- The development and sharing of a strategy with the partner universities and research centres was a crucial element so that they could all contribute towards the same objectives.
- Human resources and teamwork were crucial during the fieldwork.
- Continuous training to update knowledge is always necessary in such a technical field of work.

