

# WETWINE – Innovations in the application of constructed wetlands at wineries

## Summary

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The WETWINE project consists of testing, at two wineries, different treatment applications through the natural constructed wetlands system: for the purification of wastewater, and for the dehydration and stabilisation of sludge from a biological WWTP.

At La Vinyeta winery, located in Mollet de Peralada (Girona), a system is proposed for the treatment of wastewater generated through a prototype that combines an anaerobic digester and horizontal flow constructed wetlands in order to discharge the purified water into a public water course. The system is completed by an SDRB (sludge drying reed bed) wetland for the treatment of the sludge generated, enabling it to be incorporated into the earth as vine fertiliser.

At the Raimat winery (Codorniu group), located in Raimat (Lleida), it is proposed to install a pilot plant to check the effect of the innovative management of a dewatering system for sludge from the biological WWTP through reed beds (SDRB). The design of the system will be conventional, but the innovative management of the supply and residence time of the sludge in the SDRB is expected to optimise the surface area required to achieve its stabilisation, reducing the necessary investment costs. The ultimate goal is to define the design and dimensioning and assess the cost of the definitive SDRB installation to be proposed at the Raimat winery.

The applications and management of the constructed wetland systems proposed by WETWINE represent a technology with a much lower environmental and economic impact than traditional systems, with much less time being spent by staff on operation and maintenance.

## Objectives

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A) Check the correct design of a prototype for the treatment of wastewater generated at La Vinyeta that combines: an anaerobic digester (HUSB) with a horizontal flow wetland (HF) and a sludge dehydration wetland (SDRB), in such a way that the purified water effluent can be discharged into a public water course or be reused for irrigation.

B) At the Raimat winery a conventional sludge dehydration system using a constructed wetland (SDRB) will be managed in an innovative manner to load the different wetlands to a greater extent and alternate prolonged periods of rest in order to stabilise the sludge more quickly, reducing the wetland surface area necessary for treatment.

## Description of initiatives outlined in the project

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- Define the list of materials, drawings and site of the pilot plant.
- At La Vinyeta, test the optimal supply strategy for the anaerobic digester (HUSB), in addition to the correct operation and integration of the rest of the elements (HF, SDRB).
- At Raimat, install 8 1-m<sup>3</sup> containers supplied with sludge from the biological treatment plant. Four of them are supplied in the traditional manner, while the other four will use a more intensive sludge supply strategy.

- Analytical monitoring will be conducted at both plants.

## Expected results and practical recommendations

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### A) Results expected for La Vinyeta pilot plant:

- Definitive design and dimensioning of the pilot plant.
- Construction of the pilot plant and monitoring of its operation.
- Definition of the retention period at the most favourable HUSB for each load situation.
- Optimisation of the operation of the SDRB.
- Conclusions about the quality of the sludge obtained at the SDRB and its suitability for application at the vineyard.
- Conclusions about the quality of the treated water obtained.
- Proposal of the characteristics and design of the definitive plant to treat all of the winery's wastewater.

### B) Results expected for the Raimat pilot plant:

- The conventional SDRB pilot will enable the determination of the reduction of the time necessary to stabilise the secondary sludge from the winery with respect to urban batches. It is expected that for the winery sludge six years will be sufficient, compared to the ten years necessary for urban sludge.
- The comparison of the monitoring of the two alternatives planned in the pilot system will enable assessment of the stabilisation time reduction of the innovative SDRB management system with respect to the traditional system. It is estimated that the permanence period may be reduced to three to four years, resulting in a significantly smaller surface area necessary for the SDRB.
- Proposal of the characteristics and design of the definitive plant to treat all sludge from the winery.
- The pilot will verify the quality of the stabilised sludge and its suitability for application as a fertiliser at vineyards. Its humidity percentage will determine the number of trips to be made to apply it in the field, which will be decisive when determining the profitability of the innovative alternative.

The applications and management of the constructed wetland systems proposed by WETWINE may be applicable to the majority of small and medium-sized wineries in Europe.

## Task force leader

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Entity: **CELLER LA VINYETA**

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Typology of entity:  
**Agri-food company**

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## Task force coordinator

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Entity: **ARLALORA, S.L.**

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Typology of entity:  
**Other actors in the sector**

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## Other task force members (grant beneficiaries)

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Entity: **CODORNIU, S.A.**

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### Other task force members

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Typology of entity:

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### Subject area(s) of application

Water management

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### Geographical area(s) of application

#### **Province(s)**

Lleida

Girona

#### **Region(s)**

Segrià

Alt Empordà

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### Dissemination of the project *(publications, conferences, multimedia...)*

Information on the project will be disseminated using the resources of INNOVI, the DO Empordà Regulatory Board, La Vinyeta, Codorniu and IRTA focussing on communication to customer partners, potential publics and other interested institutions and entities: website, social media and/or newsletter. Also media: press releases and articles.

The organisation of a final presentation of the project held by INNOVI is scheduled in El Penedès and another in L'Empordà prepared by the DO Empordà Regulatory Board in order to present the pilot tests and results.

Additionally, there is interest on the part of the operating group in participating in the Seminars of the Annual Technology Transfer Plan (PATT) of the Catalonia Ministry of Agriculture, Livestock, Fisheries and Food (DARP) for the years 2019 and/or 2020 to present the project and its results.

La Vinyeta winery has an agreement in place for the stewardship of the area with the Alt Empordà Institute for the Study and Defence of Nature (IAEDEN), which includes the dissemination of stewardship actions on the part of the winery such as that of this project.

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### Project website

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### More information on the project

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### Project dates

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### Budget approved

Starting date (month-year): June 2018

Completion date (month-year):

Current status: *Underway*

**Total budget:**

**€100,015.50**

*DARP funding:*

€40,874.04

*EU funding:*

€30,834.81

*Own funding:*

€28,306.65

**With funding from:**

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Generalitat de Catalunya  
**Departament d'Agricultura,  
Ramaderia, Pesca i Alimentació**



**Fons Europeu Agrícola  
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Europa inverteix en les zones rurals

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*Order ARP/133/2017, of 21 June, approving the regulatory bases of grants for cooperation for innovation through the promotion of the creation of European Association for Innovation task forces in terms of agricultural productivity and sustainability and the execution of innovative pilot projects by these groups.*

*Resolution ARP/1868/2017, of 20 July, calling for applications for grants for the year 2017.*

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