

**BREEDING  
IN  
AGRICULTURE**



# **OPERATIONAL GROUPS AND INNOVATIVE PROJECTS**



**Unión Europea**

Fondo Europeo Agrícola  
de Desarrollo Rural

*Europa invierte en las zonas rurales*



GOBIERNO  
DE ESPAÑA

MINISTERIO  
DE AGRICULTURA, PESCA  
Y ALIMENTACIÓN



**RRN**

RED  
RURAL  
NACIONAL



*Legal notice: the content of this publication may be re-used, citing the source and date of the latest update where applicable.*

**COORDINATION:**

Management Unit of the National Rural Network's  
Subdirectorato General for Rural Revitalization  
Directorate General of Rural Development, Innovation and Agri-food Training

**EDITING AND CONTENT:**

Subdirectorato General for Rural Revitalization



June 2022

**Published by:**

© Ministry of Agriculture, Fisheries and Food,  
General Technical Secretary  
Publication Centre

Breeding in Agriculture.

Operational Groups and Innovative Projects.

NIPO: 003220999

**Catalogue of Publications by the General State Administration:**

<https://cpage.mpr.gob.es/>



**Distribution:**

Paseo de la Infanta Isabel, 1  
28014 Madrid

Teléfono: 91 347 55 41

Fax: 91 347 57 22

[www.redruralnacional.es](http://www.redruralnacional.es)

[www.mapa.gob.es](http://www.mapa.gob.es)  
[centropublicaciones@mapa.es](mailto:centropublicaciones@mapa.es)

# OPERATIONAL GROUPS AND INNOVATIVE PROJECTS

---

## **Breeding in Agriculture**

*# EsRuralEsVital*

# TABLE OF CONTENTS

## ▶ National

1. GOCA: 1. Carob Tree Farming Operational Group

## ▶ Madrid Community region

2. PISTACLON: Obtaining clonal rootstocks to grow pistachios

## ▶ Navarre

3. TOKI-POMMES: Identification and selection of native apple tree varieties

4. QUINOA: Adaptation of different varieties to Navarre's types of soil and climate

5. Development of white Garnacha wines from localised biotypes in Navarre

## ▶ Region of Murcia

6. HORTIRESILIENCIA: Vegetable seeds resilient to drought

## ▶ Valencia Community region

7. ECOBOBAL: Agro-ecological and oenological characterisation of biotypes of the native Bobal vine variety to improve quality of the wines from the DO Utiel-Requena

## ▶ H2020 Project

8. TRADITOM: Identifying, appreciating and improving traditional European tomato varieties

## ▶ H2020 Project

9. GEN4OLIVE:  
Mobilising the olive tree's genetic resources and fostering the activities prior to breeding

## ▶ Proyecto EU LIFE

10. LIFE RESILIENCE:  
Prevention of Xylella fastidiosa in intensive olive and almond orchards by applying productive green farming practices

# Introduction

This publication is a compilation of Operational Groups and Innovative Projects on agricultural breeding carried out in Spain and Europe. The National Rural Network, NRN has been entrusted with creating this publication to meet its purpose of **disseminating and raising awareness about innovative initiatives and fostering knowledge exchange and transfer** from the sphere of research to practical applications.

**Innovation is a fundamental instrument** in all areas, but especially in rural areas since this is a di sparse environment with difficult access to knowledge, the results from research, training, market developments and new technologies.

The main instrument to promote innovation in rural areas is the European Innovation Partnership for agricultural productivity and sustainability (EIP-AGRI). The EIP-AGRI aims to **accelerate innovation in the agri-food and forestry sector, and therefore in rural areas**, as well as in **disseminating successful examples of experience in the territory** through specific innovative projects. In addition, it seeks to match the range of science available to the demand from different sectors and help solve specific problems or exploit opportunities in order to help increase competitiveness and improve living conditions in rural areas.

The Operational Groups (OGs) are collectives from different sectors: agriculture, livestock, forestry, agri-food and forest-based industries, from public or private R&D&I training and consultancy centres, technology centres, non-profit institutions, and more. These parties get together to solve a problem or make the most of an opportunity using an innovative, multisectoral and collaborative approach via an innovative project. Their work is subsidised by EAFRD through national and regional rural development programmes to set up the group and prepare its innovation project, as well as to implement it.

On the other hand, in the European context, there are other policies with synergies appearing within their commitment to innovation in rural areas. The Horizon 2020 research framework programme covers matters related to the agri-food and forestry sectors. Under this umbrella, there are thematic networks and research projects.

This dossier gives the outcomes from the exchange of experiences between Operational Groups and Innovative Projects on agricultural breeding, organised by the NRN; and information units describing the Operational Groups and Innovative Projects, fostered by Measure 16 of the Rural Development Programme in Spain in this matter, thematic networks and Horizon 2020 and LIFE projects, with the aim of helping disseminate them and allowing the various interested parties to consult them.

# Conference to exchange experiences between Operational Groups and Innovative Projects on the theme of agricultural breeding

On 16 December 2020, the National Rural Network (NRN) organised an exchange of experiences between Operational Groups, innovative projects and others from Horizon 2020 and LIFE that are working on the matter of agricultural breeding. The exchange took place via a virtual meeting attended by more than 50 people representing research centres, companies, public government administrations, agricultural organisations, cooperatives, rural development groups and associations for social action.

## Objectives addressed:

The meeting was held with the following objectives:

- **To foster the creation of networks and synergies** between parties who work or have an interest in improving the agricultural breeding.
- **To help exchange information and the results** obtained by the different Operational Groups and Innovative Projects within EAFRD, the H2020 European research programme and the LIFE programme related to this topic.
- **To raise visibility about the innovation** work done by the Operational Groups and Innovative Projects.



## Conference held in two stages:

- An analysis was made of the work being carried out by the NRN as regards disseminating the work by the Operational Groups and the Innovative Projects, including the H2020 and LIFE Programmes. Furthermore, the innovative measures in rural development programmes encouraged by EIP-Agri were also examined.
- In order to bring about an exchange of innovative solutions in the sphere of breeding in agriculture, the attendees saw presentations by nine Operational Groups, Innovative Projects and projects from the H2020 and LIFE programmes, given in three parallel sessions, after which the key points discussed in each room were shared.

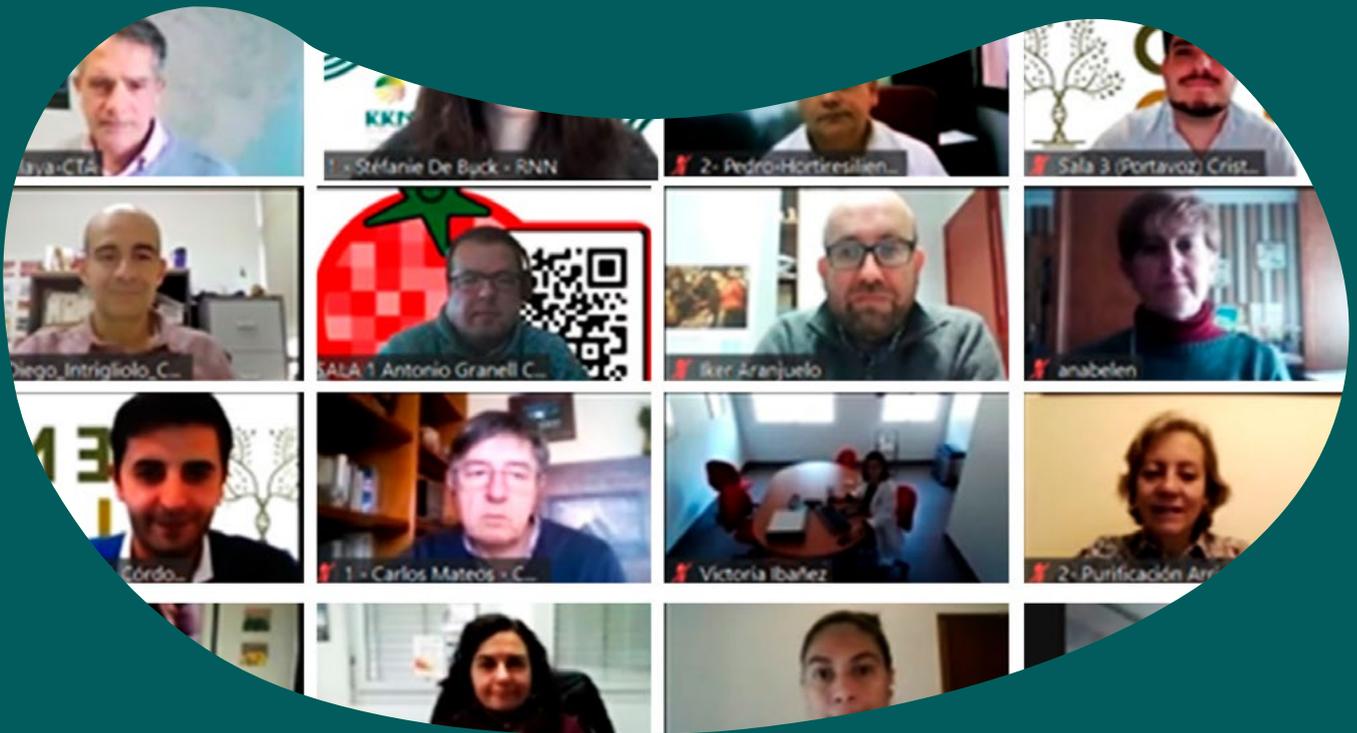
## Key ideas:

- It was found that one of the challenges facing the agricultural sector is climate change and that breeding can be an effective tool to adapt crops to its effects, especially in territories with greater water scarcity. Using improvement, organoleptic properties can also be preserved, along with tolerance and resistance to pests and diseases.
- Germplasm banks play a crucial part in the conservation, availability and use of the wide-ranging genetic diversity of plants. Native varieties are an important resource for guaranteeing nutritional and food security. Moreover, plant breeding is a powerful tool to increase the productivity of crops. It is essential that advances and innovations are accessible to farmers and transmitted via training and dissemination activities, for example, through cooperatives among their members.



- Consideration was also given to the importance of innovative projects being able to count on collaboration from all of the stakeholders involved in the sector: farmers, researchers, cooperatives, technology and research centres, and more.
- These experience exchanges help foster innovative activities that have had a positive impact, so that they can be replicated in other territories and sectors with similar needs.

For more information about the conference, click [here](#)



# GOCA: Carob Tree Farming Operational Group.

1

## RURAL DEVELOPMENT PROGRAMME

NRDP - National

## YEAR CREATED

2017

## PROJECT COORDINATOR

Empresas Innovadoras de la Garrofa (EIG)

## PARTNERS

EIG | Agroindustrial Asesores S.L.  
Frutos y Piensos Inmaculada S.A. (FRUPINSA)  
Peymar Agrícola S.L. | EMP Agrícola | Arboreto  
S.A.T Asociación Valenciana de  
Agricultores (AVA - ASAJA)



 [joan.tous.eig@garrofa.org](mailto:joan.tous.eig@garrofa.org)

- Propagation of plant material selected to enable more sustainable management.
- Exploration and assessment of potential elements of industrial and functional interest as regards the by-products obtained from the carob tree (pulp, seeds and leaves).

## Description

In recent decades, in Mediterranean countries there has been a great drop in carob tree farming areas and the crops' yield. This drop has been sharpest in Spain, the top production country, but also heavy in other countries like Italy and Cyprus. The fluctuating Spanish harvests (50,000 to 80,000 tonnes a year) are due to various factors such as the scant care traditionally given to the trees, the low percentage of pollinators, the high harvesting costs that in some cases mean that the fruit is left on the trees, frosts, droughts, etc. These factors, together with the carob's varying price, have led to a general loss of interest among farmers for this traditional crop from eastern Spain and the Balearic Islands. At the same time, the sector has some challenges to face, such as a lack of nurseries producing quality grafted plants at competitive prices, or the scarcity of modern orchards to serve as a model for farmers interested in this sustainable crop with low water needs.

The slicing industry sells around 55,000 tonnes a year, of which about 20,000 tonnes are for export, mainly for animal feed, but also for the food industry. Human consumption is a subject of great interest to the sector, both due to its new culinary uses and its potential health benefits. Raising demand and value for the carob is a challenge for the industry.

## Objectives

- An analysis of the diversity of carob trees via morphological, molecular, agronomic and nutritional characterisation.

## Expected results

- ▶ An improvement in the economic results for the producers and industries participating in the carob's value chain by increasing the crop's profitability.
- ▶ Obtaining new varieties better adapted to the market.
- ▶ Promoting the crop's sustainability.

**“For the future, orchards must be restructured to make them more intensive and able to be mechanised, especially for harvesting, and high-yielding (greater than 15%) locust bean varieties chosen with hermaphroditic pollinators. Varieties must be differentiated to make them more valuable in the market. As regards trade, possibilities for human food must be sought with new products of great functional worth”.**



# PISTACLON: Obtaining clonal rootstocks to grow pistachios.

# 2

## RURAL DEVELOPMENT PROGRAMME

RDP - Madrid

## YEAR CREATED

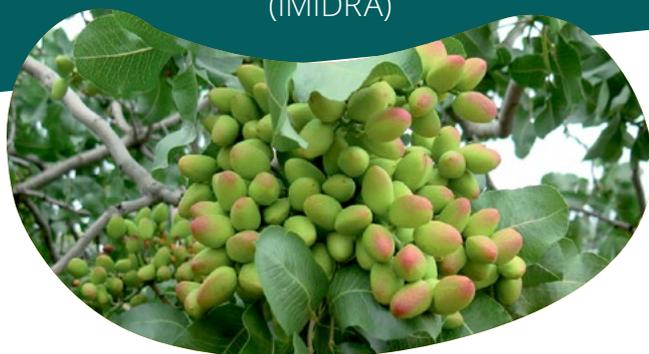
2018

## PROJECT COORDINATOR

Instituto Madrileño de Investigación y Desarrollo Rural, Agrario y Alimentario (IMIDRA)

## PARTNERS

IMIDRA | Pistachos del Sol S.L.  
Viveros Forestales Alborada S.L.



## Description

The demand for pistachios is growing around the world because its production is very profitable thanks to its high sales prices and scarce supply in Europe. In Spain, the Madrid Community region has the ideal climate for it to develop, which is why it has become the fifth fruit crop in the region. It was in this context that PISTACLON was launched with the aim of fostering a selection and improvement strategy for pistachio rootstocks.

On the one hand, this project seeks to characterise the genetic material of interest in production of the terebinth and UCB1 (a hybrid of *Pistacia atlantica* and *Pistacia integerrima*) pistachio varieties, both in the nursery and in the field. On the other hand, it intends to establish seed orchards with selected terebinth and UCB1 material. Finally, tools should be developed to enable adult individuals to be cloned efficiently, for example, by improving in vitro propagation protocols as well as protocols for capturing adult rootstocks by encouraging basal shoots.

## Objectives

- Characterisation of commercial material from UCB1 (a hybrid variety of the *Pistacia atlantica* and *Pistacia integerrima*) and terebinth by its properties of interest for production, both in the nursery and in the field.
- Seed orchards set up with selected terebinth material.
- Tools developed to enable adult individuals to be cloned efficiently, for example by improving in vitro cloning, through a culture chamber with a CO<sub>2</sub> supply and LED lighting controlled by software.



✉ [zamorano@pistachosdelsol.com](mailto:zamorano@pistachosdelsol.com)  
[pistachos.imidra@madrid](mailto:pistachos.imidra@madrid)

## Expected results

- ▶ Evaluation of pistachio plantations on two different rootstocks, UCB1 and *Pistacia terebinthus*, in juvenile and adult stages and to identify outstanding progenitors in wild populations.
- ▶ Setting up seed orchards with clonal parents from adult pistachio orchards.
- ▶ Improving adult rootstock capture protocols by encouraging basal shoots.
- ▶ Developing protocols for capturing adult rootstocks by obtaining root shoots.
- ▶ Developing protocols for rejuvenation, cascade grafting and etiolation.
- ▶ Improving in vitro propagation protocols for adult individuals.



# TOKI-POMMES: Identification and selection of native apple tree varieties

3

## RURAL DEVELOPMENT PROGRAMME

RDP Navarra

## YEAR CREATED

2019

## PROJECT COORDINATOR

Universidad Pública de Navarra (UPNA)

## PARTNERS

UPNA | Instituto Navarro de Tecnologías e Infraestructuras Agroalimentarias (INTIA)  
Instituto Vasco de Investigaciones Agrarias (NEIKER) | Conservatoire Végétal Régional d'Aquitaine (CVRA)



[carlos.miranda@unavarra.es](mailto:carlos.miranda@unavarra.es)

## Description

There is a long tradition of apple growing in the Euroregion of New Aquitaine - Euskadi - Navarre, which represents a very valuable heritage. Despite belonging to different countries (France and Spain), this area shares common cultural and ecosystem characteristics linked to apple tree growing to produce cider. However, many of this fruit tree's varieties are disappearing. Despite this great tradition, in recent years there has been a loss of genetic heritage due to constant standardisation and concentration of production in a small number of varieties.

Thanks to the Toki Pomes project, it has been possible to unify and harmonise the genetic information of apples in the region and also to appreciate and preserve some varieties in danger of extinction. To do so, an organoleptic evaluation of varieties was carried out based on different criteria such as texture, flavour, colour and size, in order to identify the most suitable varieties for consumers' preferences. As a result of this analysis, 12 varieties of native apples with potential for raw fruit consumption were chosen.

## Objectives

- Identification and selection of native varieties of adapted apple trees, such as the Reinette dorée and the Erremedio Sagarra varieties in areas of this Euroregion so as to encourage the development of specific products that contribute to the sustainable development of fruit growing in the region.
- Identification and organoleptic evaluation of varieties of interest for consumption as raw fruit.

- Pooling and harmonisation of information about plant material preserved in the Euroregion and creation of a joint database.
- Extend conservation fields for native varieties.

## Results achieved

- ▶ Harmonisation of the molecular profiles of the accessions preserved in the partners' collections, identifying the unique genotypes.
- ▶ Extension of orchards for all of the varieties selected due to interest in them in Navarre and France.
- ▶ Creation of a database with the harmonised molecular information as well as the new information generated in the project.
- ▶ Selection of a set of local varieties of great organoleptic interest.
- ▶ A study carried out on consumers' purchasing habits, apple consumption and the perception, level of knowledge and appreciation for these local varieties.



**“The Toki Pomes project is pooling data and analyses from Euskadi, Navarre and New Aquitaine with the aim of creating a wide-ranging, joint database that will act as a repository for information on native apple tree plant material of potential interest for the Euroregion”.**

# QUINOA: Adaptation of different varieties to Navarre's types of soil and climate.

# 4

## RURAL DEVELOPMENT PROGRAMME

RDP Navarra

## YEAR CREATED

2016

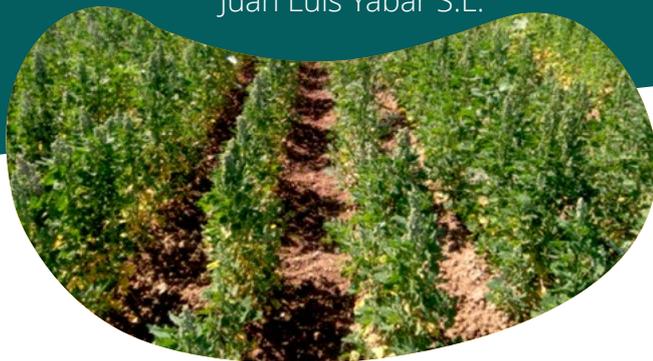
## PROJECT COORDINATOR

Juan Luis Yabar S.L.

## PARTNERS

Juan Luis Yabar S.L.

Instituto de Agrobiotecnología (IDAB-CSIC)



 [yabarjl@hotmail.com](mailto:yabarjl@hotmail.com)

## Description

Quinoa is a plant with great nutritional properties that is native to the countries in the region of the Andes. Its main producers are Bolivia, Peru and the United States. However, thanks to new technologies and genetic adaptation, quinoa farming is spreading to other parts of the world. In Europe, countries like England, Sweden, Holland, Italy and Spain have begun to show interest in this crop with high resistance to water stress in order to respond to market demand for this seed, which is naturally rich in proteins and amino acids. In this context, this project aims to introduce different varieties of quinoa seed suited to both the climate and the soils of the Chartered Community of Navarre. Studies were carried out with seeds from different origins, such as the red variety (Pasankalla), the black variety (Collana) and the Vikinga variety.



## Objectives

- Introduction of different varieties of quinoa seed that can adapt to both the climate and the characteristic soils of Navarre.
- Production of varieties of quinoa in the chartered community region that are especially accepted by consumers.

## Results achieved

- ▶ An analysis carried out in the field with different varieties from different origins, such as the red variety (Pasankalla), black variety (Collana), Titicaca and Viking.
- ▶ Identification of the Vikinga variety as the most interesting one from an agronomic and production point of view, and one appreciated by consumers.



**"In Spain, the largest quinoa farming area is mainly in Andalusia. At present, more than 2,000 hectares are being farmed annually with a yield of about 1,000 to 2,200 kg in rainfed agriculture, and it can reach 4,000 kg on irrigated land".**

# Development of white Garnacha wines from localised biotypes in Navarre.

5

## RURAL DEVELOPMENT PROGRAMME

RDP Navarra

## YEAR CREATED

2016

## PROJECT COORDINATOR

Estación de Viticultura y Enología de Navarra (EVENA)

## PARTNERS

EVENA | Bodegas San Martín S. Coop.  
Bodegas San Sebastián S. Coop. | Bodega Campos de Enanzo S. Coop. | Bodega de Sada S. Coop. | Unión de Cooperativas Agroalimentarias de Navarra (UCAN)



[www.garnachanavarraenblanco.com](http://www.garnachanavarraenblanco.com)



[sabadias@ucan.es](mailto:sabadias@ucan.es)

## Description

The project aims to enhance the white Garnacha variety, which despite being a historic variety from the Ebro Valley is still a minority in terms of grape production. Faced with this situation, since 2008 the Navarre Viticulture and Oenology Station (EVENA) has been gathering material from old vines to maintain intra-varietal genetic wealth. In this period, 21 biotypes of white Garnacha and 1 biotype of red Garnacha have been identified. Over time, a growing interest was seen from vine cooperatives in growing the white and red Garnacha varieties, as a brand of differentiated quality in the market. Based on this observation, the project was carried out in cooperation with four wine cooperatives to promote and genetically evaluate this endogenous variety.

## Objectives

- Studying the oenological potential and agronomic behaviour of the biotypes established in the experimental plot in Baretón.
- Agronomic characterisation of the plots being farmed in different vine-growing areas of Navarre.
- Fields set up for certification in different areas of Navarre so as to identify the biotypes that best adapt to the demands of wine growers and wineries, and so be able to begin the process of registering certified clones.
- Characterisation of the oenology of white and red Garnacha wines, depending on the production area and the oenological practices used.

## Results achieved

- ▶ Establishment of three certification fields: 50 plants of each of the 21 identified biotypes, and their agronomic and genetic characterisation.
- ▶ Creation of 33 different white and red Garnacha wines.
- ▶ Analysis and tasting of the wines produced, as well as obtaining their aromatic profiles.



**“In terms of what has been learned, there is the noteworthy importance of coordinated work among agricultural organisations, research centres, cooperatives and farmers to carry out research projects whose results can be transferred to the sector”.**

# HORTIRESILIENCIA: Vegetable seeds resilient to drought.

6

## RURAL DEVELOPMENT PROGRAMME

RDP Región de Murcia

## YEAR CREATED

2017

## PROJECT COORDINATOR

Instituto Murciano de Investigación y Desarrollo Agrario y Alimentario (IMIDA)

## PARTNERS

IMIDA | Agrícola Galindo S.L. | S.A.T. N° 9890  
OLÉ | Implementacion e Innovación  
Tecnologica S.L (IMPLITEC)



[www.hortiresiliencia.org](http://www.hortiresiliencia.org)

[info@hortiresiliencia.org](mailto:info@hortiresiliencia.org)

## Results achieved

- ▶ Adaptability for different varieties of tomatoes, peppers and broccoli to water stress.
- ▶ Identification and selection of varieties of tomatoes and peppers suitable for cultivation under Murcia's conditions of water stress.



## Description

This Operational Group arose from the need to find solutions to the great problem of water scarcity, which in arid or semi-arid climates such as the Region of Murcia is the main constraint on developing crops, causing a reduction in their yield and a negative impact on the agricultural sector. The project aims to innovate in farming tomatoes, peppers and broccoli, achieving drought-resilient seeds with irrigation needs from 40% to 60% less than for current varieties. These types of seeds will be obtained by selecting the ones resistant to water stress, following the genetic selection protocol carried out in the South of France.

## Objectives

- Varieties of tomato, pepper and broccoli selected that are able to adapt to water stress conditions from among the varieties developed and successfully tested in France and from the IMIDA germplasm bank.
- Verification of the behaviour of the selected varieties under the specific growing conditions in Murcia and identify the ones most tolerant to a limited water supply.
- Evaluation of production conditions under water stress.
- Identification of the varieties of economic interest for the Region of Murcia.
- Implementation of a plan to communicate, disseminate and transfer the results.

**“The main challenge facing the project is to adapt the varieties that a priori could have lower water requirements to the farming systems that are generally used in the area”.**

# ECOBOBAL: Agro-ecological and oenological characterisation of biotypes of the native Bobal vine variety to improve the quality of wines from the DO Utiel-Requena.

7

## RURAL DEVELOPMENT PROGRAMME

RDP Valencia

## YEAR CREATED

2018

## PROJECT COORDINATOR

Centro de Edafología y Biología Aplicada del Segura (CEBAS-CSIC)

## PARTNERS

CEBAS-CSIC | Instituto Valenciano de Investigaciones Agrarias (IVIA) | Consejo Regulador de la Denominación de Origen Protegida Utiel-Requena (DOP UTIEL-REQUENA)



[dintri@cebas.csic.es](mailto:dintri@cebas.csic.es)



## Description

In Utiel-Requena, viticulture occupies about 44,000 hectares and is the main economic activity in this region in the province of Valencia. About 80% of the produce is of the native Bobal variety, lending the wine produced a specific, differentiating factor, which is important in such a globalised market. One characteristic point is that it is the second most widespread vine variety in Spain after Tempranillo.

As a result of the promotion of the Utiel-Requena Denomination of Origin, this project concentrates on identifying the intra-varietal diversity of the Bobal grape and selecting plant material to be conserved in the germplasm bank, thereby counteracting genetic erosion and fostering an improvement in the quality of the wine produced in this area of Valencia. Through this project, there was an evaluation of 130,000 vines carried out over three campaigns, of which 472 possible biotypes of agronomic and sanitary quality and a capacity for ripening were selected. Today, 1,435 biotypes of Bobal vines have been identified and compared with a sample of 15 commercial clones.

## Objectives

- Identification of the intra-varietal diversity of Bobal in the Utiel-Requena area.
- Characterisation of the agronomic and oenological variability of the Bobal variety.
- Selecting the most interesting biotypes for subsequent clone selections.

## Expected results

- ▶ A pre-reselection of 30 clones with optimal grape quality, a balance between yield and production, and good behaviour in drought conditions, capable of improving the sector's competitiveness.
- ▶ To recover and evaluate eight virus-free Bobal clones, with recommendations for the rootstock to be used under rainfed or deficit irrigation conditions.

**"In today's context of climate change, this project will safeguard a variety that is perfectly adapted to natural factors and to the know-how of the wine growers and winemakers in the Utiel-Requena DO area".**



# TRADITOM: Identifying, appreciating and improving traditional European tomato varieties.

8

## H2020 RESEARCH AND INNOVATION PROGRAMME

YEAR CREATED  
2015

### PROJECT COORDINATOR

Consejo Superior de Investigaciones Científicas (CSIC)



## PARTNERS

**ES:** CSIC, Universitat Politècnica de Valencia, Asociación de Productores y Comercializadores de la Tomata de penjar d'Alcalá de Xivert, Meridiem Seeds S.L. | **IT:** Agenzia Nazionale Per Le Nuove Tecnologie, L'Energia e lo Sviluppo Economico Sostenibile, Consiglio Nazionale delle Ricerche, Arca 2010 Societa Cooperativa A.R.L. | **UK:** The University of Nottingham  
**NL:** Stichting Wageningen Research, Plant Research International | **FR:** Institut National de la Recherche Agronomique et Environnement, Centre Technique Interprofessionnel des Fruits et Légumes | **IS:** The Hebrew University of Jerusalem | **GR:** Aristotelio Panepistimio Thessalonikis | **DEU:** European Research and Project Office GmbH, Max Planck Institute of Molecular Plant Physiology  
**CRT:** Agrotobiomchanikos Synetairismos Tympakioy

## Description

Tomatoes originally came from Mesoamerica. They were discovered in the 16th century and brought to be grown in Europe. Since then, hundreds of tomato varieties have been developed around the world, but the intensification and industrialisation of agriculture in recent decades has reduced the genetic variety of tomatoes by focussing farming on the most productive and resistant varieties. Faced with this situation, TRADITOM aims to identify and place value on traditional European tomato varieties and their farming practices. This is a clear example of agricultural diversification with an impact on food security and the population's health, while supporting the economy for farmers and industries in rural areas. In order to preserve traditional varieties and prevent them from being continually replaced by more productive, resistant but often less tasty cultivars, TRADITOM is taking a two-pronged approach. On the one hand, it is identifying and certifying the sensory characteristics that make these traditional varieties more appealing to consumers. On the other hand, it is studying the most suitable cultivation techniques to overcome the weaknesses of traditional varieties in terms of productivity and resistance to pathogens, by breeding techniques and innovative agronomic practices.

## Objectives

- Conservation of the traditional varieties of tomatoes and providing information about them.



[www.traditom.eu](http://www.traditom.eu)



[agranell@ibmcp.upv.es](mailto:agranell@ibmcp.upv.es)

- Evaluation of traditional European tomato varieties.
- Plant breeding of tomato varieties.
- Value placed on these varieties via different communication, dissemination and knowledge transfer activities.

## Results achieved

- ▶ Identification and analysis of 1,800 types of tomatoes, grouped together in the TRADITOM database.
- ▶ 255 activities held to disseminate the results and transfer knowledge through different channels like educational workshops, conferences, technical training, participation in events and fairs, and more.
- ▶ 480,891 items of genetic data gathered in the TRADITOM database.

**“In terms of tomatoes and a healthy diet, TRADITOM provides a scientifically solid information platform, giving a new boost to traditional varieties with an impact on consumers”.**

# GEN4OLIVE: Exploiting the olive tree's genetic resources and fostering the activities prior to breeding.

9

## H2020 RESEARCH AND INNOVATION PROGRAMME

YEAR CREATED  
2020

PROJECT COORDINATOR  
Universidad de Córdoba (UCO)



## PARTNERS

**ES:** UCO, Universidad de Jaén, Universidad de Granada, Corporación Tecnológica de Andalucía, Gálvez Productos Agroquímicos S.L.U., Cámbrico Biotech S.L., Santa Cruz Ingeniería S.L.

**DE:** FOCOS GbR | **FR:** Centre National de la Recherche Scientifique | **GR:** Hellenic Agricultural Organisation "DEMETER", Hellenic Union of Nurseries | **IT:** Council for Agricultural Research and Economics | **MA:** The Institut National de la Recherche Agronomique Maroc | **TR:** The Olive Research Institute, Ankara University



## Description

The olive sector is one of the most important ones in the Mediterranean basin and in European agriculture. However, the appearance of diseases like *Xylella fastidiosa* and climate change are threatening the sector, while genetic resources that could hold the key to solving these problems are not being sufficiently exploited. There are currently more than 1,200 varieties of olive trees around the world, but only 5% of them are found in most of the cultivated area. Given this situation, the GEN4OLIVE project was launched as part of the H2020 European innovation programme. With this project, the intention is to improve the olive tree's genetic resources, taking into account four parameters: resilience to climate change; resistance to pests and diseases; highly productive varieties; and modern plantation systems. It also seeks to foster work prior to the breeding by in-depth characterisation of more than 500 olive tree varieties and 1,000 wild and ancient olive tree varieties' genotypes. Finally, there is a proposal to develop an intelligent, easy-to-use platform to centralise and categorise all the olive tree varieties.

## Objectives

- Identification of end users' needs and define evaluation protocols for all of the partners to work with harmonised, comparable techniques.
- Exploration and characterisation of the genetic resources of domestic, wild and ancient olive trees in the Mediterranean basin.

- Assessment of how the genotype interacts with the environment and determine the effects of climate change on the olive sector.
- Creation of an intelligent interface and two applications based on machine learning and big data to provide easy, fast access to information for end users to identify pests, diseases, and genotypes using images.
- Fostering participation from SMEs in the pre-breeding work and cooperation among different stakeholders in the sector.

## Expected results

- ▶ Full characterisation of a large number of domesticated and wild olive trees by following common protocols.
- ▶ Help in predicting the possible effects of climate change on olive trees so as to find solutions.
- ▶ Fostering participation from breeders and farmers by holding two open tenders.

**"GEN4OLIVE intends to exploit the olive trees' genetic resources, familiarising breeders of new varieties and olive growers with them in order to improve farming and food security".**

# LIFE RESILIENCE: Prevention of *Xylella fastidiosa* in intensive olive and almond orchards by applying productive green farming practices.

# 10

## EU LIFE RESILIENCE PROJECT

### YEAR CREATED

2018

### PROJECT COORDINATOR

Gálvez Productos Agroquímicos S.L.U.  
(GALPAGRO)



## PARTNERS

**ES:** GALPAGRO, Universidad de Córdoba (UCO), Agrifood Sector Communication S.L. Greenfield Technologies S.L., Asociación Agraria de Jóvenes Agricultores (ASAJA Córdoba) | **IT:** Consiglio Nazionale delle Ricerche (CNR), Trees and Timber Institute (IVALSA), Società Agricola F.lli Fontana S.s. | **PT:** Nutriprado Lda., Sociedade Agrícola da Herdade do Charqueirão Lda. (SAHC)



[www.liferesilience.eu](http://www.liferesilience.eu)



[g82vacap@uco.es](mailto:g82vacap@uco.es)

## Description

*Xylella fastidiosa* (XF) is a potentially pathogenic bacterium that has transmitted diseases in a great variety of woody crops and trees. It has raised the alarm throughout Europe since it was detected in 2013 in olive groves, infecting more than 1 million trees with the Olive Quick Decline Syndrome (OQDS), which can have a great economic impact on agriculture. Spain, Italy and Greece, the main world producers of olives and olive oil, are currently at risk of suffering losses of up to millions due to this bacterium. LIFE RESILIENCE plans to confront this challenge by using plant breeding and sustainable practices for pest control. On the one hand, in the area of genetics, genotypes of productive plants resistant to pathogens are being developed by crossing olive varieties. On the other, natural pest control methods are being applied to demonstrate their effectiveness in preventing *Xylella fastidiosa*'s negative effects. The demonstration trials are based on using fertilisers, applying beneficial products to increase low-intensity water stress, and efficient soil management, including using drones to monitor soil health, and other activities. In order to reduce the carbon footprint of the process, the irrigation systems will be powered by solar panels and wind energy, as well as optimising fertilisation and the use of plant protection products, reaching a balance thanks to alternative treatment using biological means.

## Objectives

- Crossing different olive tree varieties, evaluating their descendants and selecting potential new varieties resistant to XF.
- Demonstration of the best practices and sustainable technologies to reduce water consumption, the carbon

footprint, and increase biodiversity and resistance to pests for intensive Mediterranean olive and almond tree production systems on 250 hectares of orchards around Spain (150 ha), Italy (50 ha) and Portugal (50 ha).

- Creation of a replicable model of best practices for olives, almonds and other woody crops like citrus and vine farming systems in Europe, increasing their ability to adapt to climate change and future epidemics.

## Results achieved

- ▶ Ten to twenty new varieties of olive trees developed that are resistant to XF and compatible with intensive production systems.
- ▶ Creation of a manual of best practices with measures to control natural vectors, in order to replicate and transfer the knowledge.
- ▶ Awareness raised among European farmers about the environmental and economic effects of XF, and dissemination of applicable best practices to combat its effects.
- ▶ Thirteen farms protected from XF infection, thereby safeguarding multiple jobs.

**"Plant breeding trials and the use of sustainable practices show that both will be key elements in preventing the spread and reducing the impact of diseases caused by *Xylella fastidiosa* in areas at risk of infection in the coming years".**

**The NRN** is the hub connecting all of the people and entities related to the rural environment with the aim of raising awareness of Rural Development Programmes and providing access to them. At the same time, its purpose is to make the population aware of the importance of the rural environment for our present and our future.

The unit responsible for the NRN is the Subdirectorate General for Rural Revitalization within the Directorate General of Rural Development, Innovation and Agrifood Training of the Ministry of Agriculture, Fisheries and Food.

*# EsRuralEsVital*



# BREEDING IN AGRICULTURE



**Unión Europea**

Fondo Europeo Agrícola  
de Desarrollo Rural

*Europa invierte en las zonas rurales*



**RRN** RED  
RURAL  
NACIONAL