Sustainable production of local oats (*Avena sativa*) for the production of plant-based drinks (PROCIVADA)

Summary

LICUADOS VEGETALES was the first company to produce plant-based drinks in Spain. From the very beginning it specialised exclusively in producing and marketing plant-based drinks, mainly from soya, oat, rice and almond. According to the consultancy Nielsen, since 2017 in Spain, the volume of plant-based milk sales has increased steadily by around 8.3% to a total consumption in 2019 of 228,570 million litres; this growth has also been noted internationally. In addition, LIQUATS has noted growing consumer interest in the quality of these types of product and the fact that they are local products, i.e. both in terms of production as a plant-based drink and the origin of the raw material. These increasing demands are not only focused on organoleptic aspects such as colour, aroma and flavour, but also on the impact these types of plant-based drink can have on health and reducing the carbon footprint from obtaining the product.

Consequently, this study of oat production in Catalonia by GRANS de LLUÇANÈS was motivated by the interest in obtaining local raw materials, as oat milk one of the most nutritionally rich plant-based drinks, while oat production in the region is very low and the product is mainly used for animal feed. Thus, there is a need to study introducing oat farming in Catalonia to offer healthy products for human nutrition obtained from local products, with the aim of reducing the current carbon and water footprint.

Having both a plant-based drinks industry such as LIQUATS and a production and storage structure such as GRANS del LLUÇANÈS offers a great opportunity for the production sector to diversify its product. Furthermore, IRTA's participation as an expert in the knowledge, study and development of new varieties, as well as carbon and water footprint studies, will enable us to undertake the proposed studies in depth. Finally, the participation of the farmers' association ADV Sustainable Arable Crops will help disseminate information and conferences among its members, ensuring much more efficient dissemination and transfer.

Objectives

The main objective of this pilot project is to assess the viability of oat farming for the production of plant-based drinks in Catalonia, introducing new plant material and adapting agronomic practices to improve sustainability in production.

The following secondary objectives are proposed in order to achieve the general project objective:

- Assess and rate new varieties of oats (new plant material) both from the agronomic point of view and then their adaptation to the food industry for the production of plant-based drinks.
- Contribute to a more sustainable crop, assess more environmentally friendly forms of production and quantify the carbon and water footprint of oats produced in Catalonia.
- Assess the physical-chemical characteristics of oat grain and its yield to obtain plant-based drinks, determine the organoleptic characteristics of the liquefied product.
- Improve industrial processes while also testing new ways of obtaining plant-based drinks from oat grain.
- Transfer the results to the production sector.

Description of the actions planned in the project

Five actions will be carried out to achieve the objectives of the project:

- **Activity 1. Positioning of oats in relation to other crops, depending on the production area**
  The interest in oats among producers in a particular farming area is determined by its profitability and by its agronomic advantages compared to other potential crops. This first activity in the project will compare the productivity and profitability of oat, common wheat and barley over two seasons.

- **Activity 2. Assessment of the suitability of oat varieties for plant-based drink production**
  The second activity aims to assess and rate new varieties of oat, in both agronomic terms and in their adaptation to the food industry for plant-based drink production. Therefore, the physical-chemical characteristics of the oat grain and its yield will be determined in order to obtain plant-based drinks, determining the organoleptic characteristics of the liquefied product.

- **Activity 3. Study of the improvement in oat farming sustainability**
  This will involve studying the effect of oat farming on crop rotation in cereal farms, the water and carbon footprint of commercial oat production and the introduction of more sustainable farming practices.

- **Activity 4. Establishing pilot demonstration plots for producing oat for plant-based drinks**
  The fourth project activity will involve pilot oat farming to assess agronomic performance, determine the grain shelling yield and assess oat production costs in agronomic terms.

- **Activity 5. Transfer of results**
  Finally, throughout the project, results transfer activities will be carried out in the form of field trips and workshops. In addition, dissemination will be carried out via the project participants' social media and websites.

Expected results and practical recommendations

- ACTIVITY 1. Information will be obtained on the adaptation to and interest in oat farming in various production areas based on its yield, agronomic advantages and profitability compared to other crops such as barley and soft wheat.
- ACTIVITY 2. The interest in new commercial oat varieties in agronomic terms and for the production of plant-based drinks will be discussed. In addition, the results of characterising the grain produced and resulting plant-based drinks will be obtained for each batch, from the laboratory and pilot plant.
- ACTIVITY 3. The effect of crop rotations including oat as a precedent, as well as the results of the water and carbon footprint and the most sustainable practices for oat farming, will be established.
- ACTIVITY 4. The pilot plots will provide information on the yield, agronomic problems, cost and profitability of oat farming on producers' farms.
- ACTIVITY 5. Effective dissemination of the most innovative results for both the sector and for scientific study, through communications at conferences, seminars, etc.

Leader of the Operational Group

ORGANISATION: LIQUATS VEGETALS, SA

Coordinator of the Operational Group

ORGANISATION: LIQUATS VEGETALS, SA

Other members of the Operational Group (grant recipients)

ORGANISATION: GRANS DEL LLUÇANÈS, SL

Other members of the Operational Group (not recipients of the grant)

ORGANISATION: IRTA - Institute of Agrifood Research and Technology

ORGANISATION: ADV CONREUS HERBACIS SOSTENIBLES

Subject area(s) of application

☒	Agricultural production system
☒	Agricultural practice
☐	Agricultural equipment and machinery
☐	Livestock farming and animal welfare
☒	Vegetable production and horticulture
☐	Landscape / Territorial management
☐	Pest and disease control
☐	Fertilisation and nutrient management
☒	Soil management
☐	Genetic resources
☐	Forestry
☒	Water management
☐	Climate and Climate Change
☐	Energy management
☐	Waste and by-product management
☐	Biodiversity and environmental management
☒	Food quality/processing and nutrition
☐	Supply chain, marketing and consumption
☐	Competitiveness and agricultural and forestry diversification
☐	General

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Tarragona	Alt Camp
Girona	Alt Empordà
Barcelona	Alt Penedès
Lleida	Alt Urgell
Lleida	Alta Ribagorça
Barcelona	Anoia
Barcelona	Bages
Tarragona	Baix Camp
Tarragona	Baix Ebre
Girona	Baix Empordà
Barcelona	Baix Llobregat
Tarragona	Baix Penedès

Barcelona	Barcelonès
Barcelona	Berguedà
Lleida	Cerdanya
Tarragona	Conca de Barberà
Barcelona	Garraf
Lleida	Garrigues
Girona	Garrotxa
Girona	Gironès
Barcelona	Maresme
Tarragona	Montsià
Lleida	Noguera
Barcelona	Osona
Lleida	Pallars Jussà
Girona	Pla de l'Estany
Lleida	Pla d'Urgell
Tarragona	Priorat
Tarragona	Ribera d'Ebre
Girona	Ripollès
Lleida	Segarra
Lleida	Segrià
Girona	Selva
Lleida	Solsonès
Tarragona	Tarragonès
Tarragona	Terra Alta
Lleida	Urgell
Barcelona	Vallès Occidental
Barcelona	Vallès Oriental

Dissemination of the project (publications, conferences, multimedia, etc.)

The following transfer activities are planned for disseminating the project:

1. Field trip on oat farming for extensive crop producers. A conference is planned for April-May 2024.
2. Oat farming workshop for extensive crop producers. This is scheduled for September-October 2023.
3. Dissemination on social media (LinkedIn, Instagram, Twitter) and the project participants' websites.

It is worth mentioning the involvement of the farmers' association ADV de Conreus Herbacis Sostenibles in the consortium, as they will provide information and publicise the planned conferences among their members, thus providing much more efficient dissemination and transfer.

Project website

More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	**Total budget:** €246,506.88
	DACC funding: €113,997.81
Current status: Under way	**EU funding:** €85,998.34

	Own funding: €46,510.73

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Order ARP/113/2021 of 20 May, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ACC/1660/2021, of 27 May, announcing the call for the grant.

Generalitat de Catalunya
Departament d'Acció Climàtica, Alimentació i Agenda Rural

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