

Improving the agronomic feasibility of alfalfa (*Medicago sativa* L.) production for fodder in Catalonia (AlfalsCAT)

Summary

Alfalfa is the most important fodder crop in Catalonia. According to statistics from the Ministry of Agriculture, Livestock, Fisheries and Food, in 2020 it accounted for 23% of the total volume of arable crop production in Catalonia with 1,365,400 t of production and occupying a total of 33,292 ha of cultivation. In Catalonia, 65% of production is concentrated in the Segrià, Pla d'Urgell and Noguera regions, with 46% of the area dedicated to this crop in Catalonia. Alfalfa is also the mainstay of a powerful processing industry in Catalonia. This industry dehydrates a large part of the alfalfa produced in Catalonia (85% AEFA 2020) and has shown a great capacity to export and open up new markets.

The importance of alfalfa from a strategic point of view for Catalan agriculture is clear, it is a very important source of vegetable protein for animal feed, it is a crop that contributes to a more sustainable agriculture creating a positive synergistic effect with other crops in the rotation, providing nutrients and improving soil structure, reducing erosion, fixing atmospheric nitrogen and helping to reduce the excess of this element in the soil and nitrate pollution. It is also a crop that, compared to other crops, requires less use of phytosanitary products.

Currently there are several agronomic problems in alfalfa cultivation, which in recent years are increasing in importance and incidence, compromising the economic viability of the crop. Some of these problems, such as the persistence of the crop, the stagnation of yields, the low seed production of current varieties, the lack of varietal purity of the seeds or the lack of control of some of the main pests, will be dealt with in the project.

Objectives

The main objective of the project will be to improve alfalfa production and yields in Catalonia without compromising environmental sustainability, with the following secondary objectives:

1. Evaluate and assess new varieties of alfalfa or varieties that are not already established in our territory, both from an agronomic point of view and from the point of view of forage quality. Diagnosis of the causes affecting the decrease in crop persistence. Objective study of different management techniques that can contribute to increasing crop persistence.
2. Objective study of different management techniques that can contribute to increasing seed production under our conditions. Study of the feasibility of implementing a system to identify the varietal purity of certified seed lots using molecular techniques.
3. Study the effectiveness of alternative (non-chemical) control methods for the control of the black leaf beetle (*Colaspidema atrum* Latr.) in alfalfa.
4. Transfer to the sector the actions and results carried out and achieved within the framework of this project.

Description of the actions planned in the project

The following actions will be carried out in order to achieve the aforementioned objectives:

Activity 1. Diagnosis and control of factors affecting the crop persistence. Evaluate and assess new varieties of alfalfa or varieties that are not already established in our territory, both from an agronomic point of view and from the point of view of forage quality. Diagnosis of the causes affecting the decrease in crop persistence. Objective study of different management techniques that can contribute to increasing crop persistence.

Activity 2. Improve the viability of seed production and varietal identification. Objective study of different management techniques that can contribute to increasing seed production under our conditions. Study of the feasibility of implementing a system to identify the varietal purity of certified seed lots using molecular techniques.

Activity 3. Effective pest control with currently available tools. Study the effectiveness of alternative (non-chemical) control methods for the control of the black leaf beetle (*Colaspidea atrum* Latr.) in alfalfa.

Activity 4. Transfer of the results. Transfer to the sector the actions and results carried out and achieved within the framework of this project.

Expected results and practical recommendations

The project will generate valuable information to improve the viability of the crop, in order to obtain higher yields and better quality production, with environmentally friendly strategies. At the technical level, a large volume of data will be generated that will reveal the best way to tackle the different problems currently facing the crop.

Plant material: information will be obtained on the adaptation of new varieties to our conditions compared to the ecotypes currently cultivated. At present, cultivation is limited to the Empordà, Aragó ecotypes and some derived varieties, unchanged in the last 30-40 years.

Crop persistence: the study of the factors that affect the crop persistence in Catalonia will help identify using objective data the main factors that affect this crop issue depending on the type of management.

Improving the viability of seed production: information will be obtained on the best management techniques that can contribute to increasing seed production under our conditions.

Varietal identification: feasibility of implementing a system to identify the varietal purity of certified seed lots using molecular techniques.

Pest control: effectiveness of alternative (non-chemical) control methods for the control of the black leaf beetle (*Colaspidea atrum* Latr.) in alfalfa.

Leader of the Operational Group

ORGANISATION: DESHIDRATADORA DOLCET, SLU

Coordinator of the Operational Group

ORGANISATION: IRTA - Institute of Agrifood Research and Technology

Other members of the Operational Group (grant recipients)

ORGANISATION: AL DAHRA EUROPE SRL BRANCH IN SPAIN

ORGANISATION: SEMILLAS BATLLÉ, SA

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

ORGANISATION: AGROTECNIO

ORGANISATION: SPANISH ASSOCIATION OF DEHYDRATED ALFALFA MANUFACTURERS

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

<input checked="" type="checkbox"/>	Pest and disease control
<input type="checkbox"/>	Fertilisation and nutrient management
<input type="checkbox"/>	Soil management
<input checked="" type="checkbox"/>	Genetic resources
<input type="checkbox"/>	Forestry
<input type="checkbox"/>	Water management
<input type="checkbox"/>	Climate and Climate Change
<input type="checkbox"/>	Energy management
<input type="checkbox"/>	Waste and by-product management
<input type="checkbox"/>	Biodiversity and environmental management
<input type="checkbox"/>	Food quality/processing and nutrition
<input type="checkbox"/>	Supply chain, marketing and consumption
<input type="checkbox"/>	Competitiveness and agricultural and forestry diversification
<input type="checkbox"/>	General

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Catalonia	

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

There are plans to present the innovative elements and results of the project at trade fairs, conventions and specific seminars, and also through the media used by each of the companies (personalised emails sent to customers, conventions, catalogues, commercial documents, newsletters, etc.) in order to increase and multiply the scope of communication.

In addition, the results of this project will be published. The IRTA subcontracted research centre will be actively involved in the dissemination of the results through the centre and through the scientific and technological platforms on which it participates. In fact, it will be the coordinator.

AEFA as a partner in the project will help to provide much wider and more effective coverage and dissemination of the results.

Furthermore, and in accordance with 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, the results will be disseminated through the EAI and the public will be informed of the grant obtained from the European Agricultural Fund for Rural Development during the implementation of the project as follows:

- The award of the grant will be published on the website of the companies participating in the project, along with a brief description of the operation, the objectives and results of the project and with a reference to the grant obtained from the European Union.

- In addition, information on the project will be published on the research centre's website, in line with the participating companies.

Project website

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More information on the project

PROJECT DATES	TOTAL BUDGET
Starting date: July 2021	Total budget: €246,132.00
	DACC funding: €113,824.44
Current status: Under way	EU funding: €85,867.56
	Own funding: €46,440.00

With funding from:

Project funded through Operation 16.01.01 (Cooperation for Innovation) through the Catalan Rural Development Programme 2014-2022.

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.

