

*Una manera de hacer Europa*



# **BUENAS PRÁCTICAS Actuaciones Cofinanciadas**

"Obtaining high-quality durum wheat varieties adapted to Castilla y León for the processing industry"

Castilla y León Agricultural Technology Institute

# **Programa Operativo de Castilla y León**

**Año 2019**

**Fondo Europeo de Desarrollo Regional**



**Good Practise presented by the Castilla y León Agricultural Technology Institute consisting in "Obtaining high-quality durum wheat varieties adapted to Castilla y León for the processing industry".**

The Castilla y León Agricultural Technology Institute, hereinafter ITACyL, co-finances the development of knowledge generation projects, carried out by researchers from ITACyL, related to strategic regional sectors, to improve the sustainable competitiveness of the regional agricultural and agri-food sector.

These projects include the project entitled "Obtaining high-quality durum wheat varieties adapted to Castilla y León for the processing industry".

Wheat, in its two most widespread cultivated species (flour wheat, *Triticum aestivum L.*, and durum wheat, *Triticum durum L.*), is the main food crop worldwide, and is considered a key crop for food security. In Castilla y León the surface area occupied by arable crops is around 2.5 million hectares; around 32% of this area is occupied by wheat crops.

90% of the total surface area of durum wheat grown in Castilla y León and in Spain is under dry conditions, where the scarcity and distribution of rainfall is the main limiting factor, and where yields vary greatly from one season to the next. Likewise, projections for 2060 indicate an increase in the frequency of drought episodes. To address these problems, there is a need for incorporating traits related to yield stability, water use efficiency and drought tolerance as a goal and to develop varieties for our specific conditions.

Likewise, obtaining grain with the quality required by the processing industry and consumers is an aspect that can and should also be addressed. At this point in time, the processing sector linked to durum wheat is demanding high quality varieties.

The project's total budget amounts to 372,787 euros, 50% of which is co-financed by ERDF, the aid in this case amounting to 186,393.50 euros.

The project is expected to have a direct impact on both the primary sector and the regional processing industry. The aim is to ensure that the surface area where durum wheat is being grown in Castilla y León is sufficient to supply the region's semolina industry with raw material, a sector that consumes some 82 000 tonnes a year, i.e. 15 000-16 000 hectares of durum wheat in the Autonomous Community.

This action is considered a good practise as it meets the following criteria:

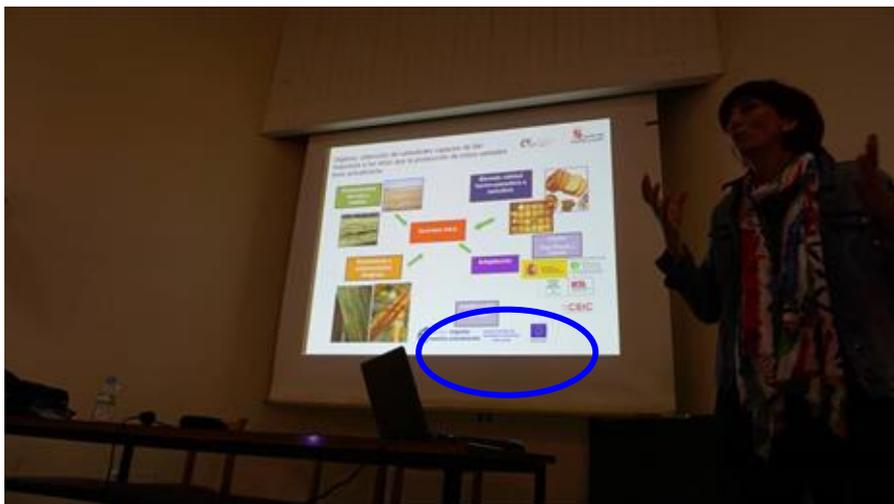
**1. The operation has been adequately disseminated to beneficiaries, potential beneficiaries and the general public.**

In addition to complying with the corresponding regulatory obligations, such as placing a plaque in the laboratory where the project is carried out and disseminating the project through a specific section within the ITACyL website, important dissemination actions have been developed for this project.

<http://www.itacyl.es/investigacion-e-innovacion/nuevo-modelo-de-investigacion-agraria-y-agroalimentaria-de-castilla-y-leon/financiacion-competitiva-europea>

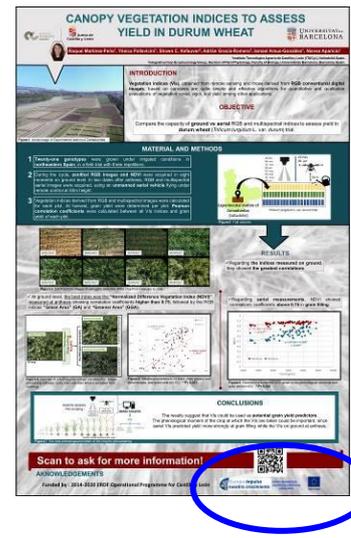


On the one hand, there have been conferences aimed at farmers and cooperatives and representatives of the processing sector.



Conferences aimed at the scientific community have also been developed, such as the First Spanish Symposium on Cereal Physiology and Breeding held in Zaragoza.

Martínez-Peña *et al.* *Canopy vegetation indices to assess yield in durum wheat*



There have also been workshops aimed at the general public, such as those aimed at students as part of the Castilla y León Science Week, with the workshop "GENETIC IMPROVEMENT OF DURUM WHEAT", held at various secondary high schools in Castilla y León, being particularly noteworthy.



This project has also disseminated its actions through ITACyL's social networks.

<https://www.facebook.com/itacastillayleon/>

<https://www.linkedin.com/company/itacyl>

<https://twitter.com/itacyl>



## **2. The actions incorporate innovative elements.**

The final purpose of these actions is to obtain a new variety, which is in itself an innovation.

Throughout its development, material is generated that provides a real differential value to what is on the market up then. In order to be registered and marketed, a new variety must meet three characteristics: it must be new, stable and homogeneous. A new plant variety should be defined by the expression of the characteristics resulting from a certain genotype or combination of genotypes and should be different to any other existing until then.

The subsequent transfer of these new varieties to farmers, to help them increase the added value of their products, is a substantially new development at sectoral level.

Another innovation of this operation is the application of digital photography and the Normalised Difference Vegetation Index (NDVI), which is an index that is used to estimate the amount, quality and development of vegetation, as selection tools for drought resistance related characters. These innovative methodologies will help to identify genotypes, better adapted to our environments, and to implement methodologies to increase their efficiency.

## **3. Adaptation of the results obtained to the established objectives.**

"Obtaining high-quality durum wheat varieties adapted to Castilla y León for the processing industry" is allowing to develop a programme to improve durum wheat, aimed at making available to Castilla y León's primary sector durum wheat varieties capable of responding to the current challenges of this crop: high productivity and adaptation to the expected environmental changes in a climate change scenario, with the capacity to respond to the quality demands of the processing sector and incorporating disease resistance; allowing its production to be environmentally-friendly and within the framework of sustainable agriculture.

The final transfer to farmers of the new varieties obtained through the aforementioned programme is expected to help them increase the added value of their products and improve the profitability of their farms.

## **4. Contribution to the resolution of a problem or weakness detected in the territorial scope of implementation.**

Unlike what happens in other countries such as Italy, here, both at national level and in our Autonomous Community, the problem lies in that there has been very little genetic improvement in durum wheat, based on its cultivation on imported varieties. The varieties planted by farmers have been achieved by foreign companies, which introduce varieties obtained in other countries, and are therefore not developed to cope with the specific agroclimatic conditions of Spain and even less so those of Castilla y León.

It seems obvious that in order to reduce this reliance on foreign varieties there should be a specific improvement programme, capable of producing quality varieties adapted to the areas where they are to be grown, as it has been understood by the most agriculturally advanced countries.

In the current circumstances, a good durum wheat improvement programme could be very profitable for Castilla y León. For all the above reasons, the Castilla y León Agricultural Technology Institute has launched the operation that is being presented as good practise "Obtaining high-quality durum wheat varieties adapted to Castilla y León for the processing industry".

**5. High coverage of the target population.**

Transfer actions have great importance in the project, and these have a varied target audience: farmers, semolina companies and processing industries; consumers; the Castilla y León society in general and specific groups (scientific - students) in particular.

The implementation and development of this project will lead to achieving essential scientific-technical progress both for the primary sector, agriculture, and for the agri-food industry, thanks to the research and development of new lines and varieties of seeds.

This will also benefit society, since it will have products, pasta, with better nutritional characteristics.

**6. Consideration of the cross-cutting equal opportunities and non-discrimination criteria, in addition to social responsibility and environmental sustainability.**

The project is coordinated by a female researcher and the five-member team includes three women and two men.

From an impact's point of view, it does not produce any discriminatory effect since men and women will benefit equally from its results.

The activities to be developed throughout the project are framed within the context of a sustainable agri-food system, which promotes the use of technology and agricultural practises to maintain or increase productivity without depleting or damaging natural resources. This involves great commitment in terms of environmental responsibility, relying on a sustainable and environmentally friendly production.

Developing wheat varieties with the characteristics defined in the above sections will mean that the farmer will obtain greater stability in production; a more sustainable agriculture will be achieved and there will be a lower environmental impact from agriculture, as there will be no need for so many phytosanitary treatments.

If an increase in the production of durum wheat is achieved in Castilla y León, the semolina industry will have a more stable and sustainable supply, as the raw material is close to the final consumer industry and will not rely on imported products. This will also lead to significantly reducing costs, since durum wheat is a product that does not travel well due to its large volume and weight and has a low price, which means reducing a large part of the logistical cost because it can be purchased in nearby markets. The proximity between the production of durum wheat and the semolina industry will not only reduce transport costs but also improve the carbon footprint of the final product.

**7. Synergies with other policies or public intervention instruments**

This project is linked to regional strategic sectors, identified in the Castilla y León 2014-2020 Smart Specialisation Strategy, to improve the sustainable competitiveness in the regional agricultural and agri-food sector.

Furthermore, this project contributes to reinforcing the different actions carried out by the Regional Ministry of Agriculture, Livestock and Rural Development aimed at increasing the profitability of this crop in our Autonomous Community. Due to the agricultural sector's relevance at regional level, it was decided to implement actions to enhance its improvement within the 2014-2020 Rural Development Programme, designed by the Regional Government of Castilla y León, which identified seven strategic sectors, including the high value-added arable crops sector (quality and

high strength wheat, rapeseed, high oleic sunflower and protein peas). In this context, the cultivation of quality durum wheat, which is the goal of this action, was also included.

On the other hand, developing new crops is a response to the guidelines given by the CAP in relation to greening, thus favouring the sector's adaptation. In particular, the increase in number of crops in the proposed crop rotation and crop diversification is a desirable environmental measure, as it balances the agro-ecosystem by reducing the impact of weeds and diseases.

However, until a few years ago, due to the lack of regulation on wheat quality, farmers were not interested in producing quality varieties. However, with the approval in 2010 of the Quality Standard for wheat, the regional and national semolina processing industry is increasingly demanding quality wheat and farmers are facing the great challenge of meeting this demand for which they require varieties with such quality.

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