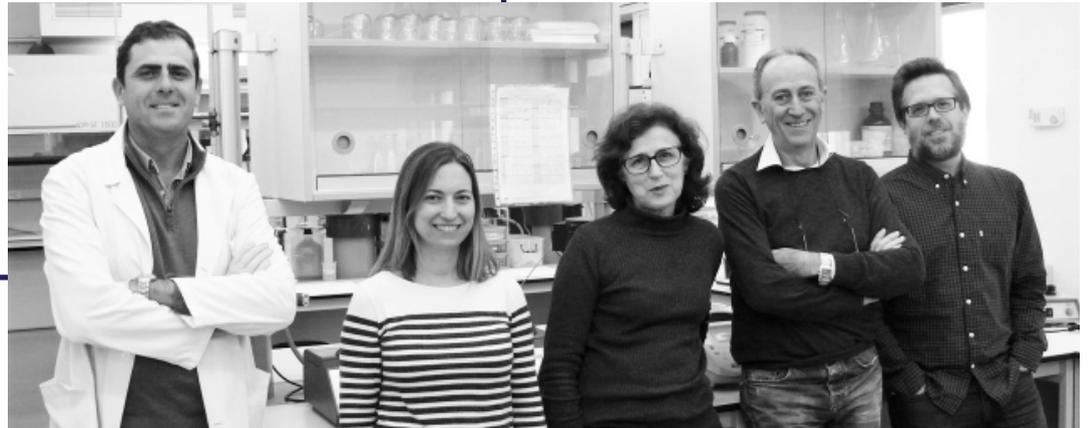


PROJECT CODE: H2020-MSCA-IF-2018-844431
CALL: H2020-MSCA-IF-2018
PERIOD: 24 MONTHS
BUDGET: 160,932.48 €
PRINCIPAL INVESTIGATOR: JUAN GIL LIGERO



According to the FAO, food production needs to increase by 70% by the year 2050 in order to satisfy world demand and guarantee food security. The ability to feed the world in the future will depend on the development of new methods and technologies for growing crops that can sustainably increase production and performance. What is more, we will need crops that can adapt to changing climate conditions, without losing sight of the fact that they must also be profitable for the agricultural sector.

One of the main features that defines crop adaptation to different climate conditions is flowering time. Increasing temperatures can cause damage to the development of flowers and pods. Moreover, a lack of cold can cause flowering to occur gradually or not even to occur at all, significantly influencing its productivity. Therefore, the aim is to procure varieties with flowering cycles that are adapted to these conditions.

This is the context in which Project FORCE was born, the project taking on the task of studying which garbanzo bean genes control flowering time. This project is part of the genetic improvement program for garbanzo beans at the University of Cordoba and is coordinated by the AGR-114 "Genetic Plant Improvement" group, led by Professor Juan Gil since its establishment in 1995. Professor Gil has vast experience in the field of grain legume plant breeding, mainly broad beans and garbanzo beans. Besides, this group has a lot of data, over many years, made up of a large number of garbanzo bean varieties that have a wide

range of flowering times and that are essential for this project.

The University of Cordoba team is made up of José Vicente Die (project leader), Professor Juan Gil (project supervisor) and researchers Teresa Millán, Patricia Castro and Rocío Carmona (Carmona is in training). Also working with the team are researchers Cristina Caballo and Josefa Rubio from the Andalusian Institute of Agricultural and Fisheries Research and Training (IFAPA) of the Andalusian Regional Government.

Project FORCE aims to identify the genes that control garbanzo bean flowering in order to choose the best adapted material to certain climate conditions

The first stage of Project FORCE is devoted to studying the different kinds of garbanzo beans in growth chambers, where the team controls parameters such as day and night temperatures. During this stage, data will be gathered on all aspects that could

be relevant. "The plants in this study have different flowering times, meaning that there are early and late flowering plants. In addition, the different kinds of plants make us think that the set of genes controlling flowering time could be different", says researcher José Vicente Die.

In the second stage, the research team will obtain part of the genome sequence using the latest mass sequencing technology, which will allow for performing big data analyses and quickly obtaining precise genetic maps. By means of this process, the gene regions associated with flowering times will be attempted to be located.

Finally, in the last stage, these regions will be studied in detail in order to understand what the differences in flowering times are due to. "At this stage we will develop genetic markers that will allow us to choose the material from improvement programs in a much more effective way in terms of its flowering times", reveals the researcher.

Broadening our understanding of what genomic regions control flowering time in garbanzo beans will allow us to develop new strategies for improving this crop. It will be possible to identify and choose the best "parents" to cross for certain climate conditions, saving time and money for professionals in the agricultural sector.

