

# eOrchard Pistachio

Cutting Costs and Improving  
Production of Pistachios

## Consortium



## Sector

AGRICULTURE

## Duration

**10**  
MONTHS

## Challenge

The dry areas with mellow hills in Toledo, Castilla la Mancha region, are home to the orchards of Spain's largest vendor of the pistachio crop, Pistachos del Sol. Since the area of more than 110 hectares of land stretches from the hilltop down to the flatland in the proximity of a creek, the diverse land and different depth of the phreatic zone resulted in different growth of the pistachio trees in different areas. It also caused some local issues like mildews in certain areas, despite being managed as best as possible with the given knowledge about the area. Enabling smarter management of the plants both in the field and at the organizational level can help to greatly cut costs and improve outputs.

## DIATOMIC Support

The bootcamp and meetings with the other DIATOMIC experiments were very valuable for the exchange of ideas and viewpoints regarding technology in Agriculture. Having a number of consortia present at the common event, whose members work in the agriculture technology industry and focus on a limited number of domains, was definitely very useful within DIATOMIC. Besides that, we were able to take part in some interesting webinars where we could learn about new practicalities. Finally, the mentors supported us throughout the entire process with guidance, advice and suggestions, which only made us better.

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### Timeline

During the Design phase, we had to identify with the end-user the most pressing issues they needed to be addressed, and then based on that we focused on designing the solution itself. A decent amount of time went into understanding the agronomic aspects of the problem as well. A plan was also developed for the deployment of the Advanced Microelectronics in the orchards, based on the orchard characteristics.

During the Development phase, most of what was planned during the Design phase was executed with plenty of hard work by everyone involved. Several visits to the fields allowed us to learn more about the area, and we even repositioned some of the installed sensors. Multiple iterations of testing and improvement of the software features were performed, and we learned that this will be an ongoing process that will need to be tailored for each installation. We even secured our first beta customer during the development stage. In the Market stage, we focused on disseminating the results through different materials, including a case study, as well as participation in several agricultural fairs. We are currently working further on acquiring new customers.

### Stakeholders

Different personnel from the companies Elmibit (eOrchard developer company), Genetic-AI (a Spanish R&D company with smart agriculture as one of its focus areas, taking care of several development, as well as deployment, aspects), as well as Pistachos del Sol (the pistachio vendor with pistachio orchards).

### End Users

Mainly larger producers of pistachios (with at least 20 hectares of orchard area), as well as other crops that can benefit from precise irrigation and management.

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### Key Results

The product transitioned from a TRL-5 to a TRL-9 commercialization level, and use of the product by the initial users picked up during the season. The evaluation of “Value” and “Ease of use” parameters of the installed system was 4.54 and 4.93 out of 5 respectively, indicating that the system is valuable and not getting in the way of the end-users in their everyday operations. In an area of the orchard that has shown to be over-irrigated earlier, an estimate of 20% irrigation reduction across the whole season is indicated based on the results from the part of the season in which the experiment was conducted. Furthermore, in the areas that require more “manual activity” by the farmers to start and run the irrigation, an estimated 1 or 2 irrigation cycles can be reduced, stripping the high cost (including labour, gasoline and vehicle usage) by 3-5%. Moreover, regarding the administrative activities, time spent was also cut with the help of integration information management.

### Impact

Currently, besides Pistachos del Sol, the system is already installed in the orchards of another customer in the United States, while a third customer has been onboarded. The experiment resulted in plenty of new experience in irrigation management and implementation of Cloud-based tools in farming, which was fostered through field visits by technical personnel and provided by the farmers of Pistachos del Sol. This new experience is invaluable, because even though we had prior experience with different countries and different crops, we now learned about the specifics and functioning of the pistachios market. This has helped us identify some new potentials for improvement of the solution, as well as the originally envisioned offering for the market in the future.

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## Testimonials

“ *The system helps us understand when to irrigate, in what quantity to irrigate, when to stop, as well as the evapotranspiration we need to take into consideration.*

– Luis Ortega, end-user

“ *The solution has helped us a lot, because in one side of the orchard, there is a high phreatic water level, and it helps us understand the lack of necessity to irrigate there.*

– Luis Ortega, end-user

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