

ACTIVITIES & OBJECTIVES

- ✓ Mapping farmers' needs and current frost-protection practices
- ✓ Designing and developing an intelligent Internet of Things (IoT) system to monitor selected atmospheric and agronomic parameters, forecast frost events, and provide early warnings of upcoming adverse conditions.
- ✓ Implementing sustainable, low-carbon-footprint techniques, ahead of frost events, to reduce epiphytic populations of ice-nucleation-active (INA) bacteria to levels that do not promote ice formation on crops.

DISSEMINATION & INFORMATION ACTIVITIES

- ⇒ Promoting the project and its outcomes across regions with diverse geographical and climatic characteristics.
- ⇒ Supporting the adoption of best agricultural practice to enhance crop resilience and minimize the impacts of frost events.
- ⇒ Fostering environmental awareness and encouraging responsible attitudes toward climate change mitigation and environmental protection.

THE CONSORTIUM

The LIFE-FROSTDEFEND project is implemented by the following institutions:

- National Centre for Scientific Research "Demokritos" (NCSR), Greece, Project coordinator
- Agricultural University of Athens (AUA), Greece
- Agricultural Cooperatives Union Aeghion SA (ACUA), Greece
- Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE), France
- mSensis SA, Greece



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Forecasting and protecting fruit crops from frost damage



LIFE FROSTDEFEND

THE CLIMATE IS CHANGING

Climate change (CC) is increasing climate instability, leading to more frequent and severe extreme weather events. It is widely recognized as one of the most pressing challenges facing modern society, highlighting the urgent need for effective adaptation measures. The impacts of CC are already evident across various sectors, particularly those that depend heavily on natural resources.

Agriculture is one of the sectors most vulnerable to weather variability and climate extremes. Crops are especially sensitive to frost during critical reproductive growth stages. As rising temperatures accelerate crop development, these vulnerable stages may occur earlier in the growing season, when frost risk remains high. As a result, frost damage and related yield losses may increase, despite the overall rise in average temperatures.



THE PROJECT

The LIFE FROSTDEFEND project aims to develop and demonstrate the benefits of an innovative tool that monitors orchard conditions and predicts frost risk, helping to reduce frost-related damage.

The project started in September 2021.

The total budget amounts to €1.94 million, with contributions as follows:

- €1.03 million from the European Union.
- €0.91 million from the project partners.



LIFE FROSTDEFEND



FROSTDEFEND INNOVATION

We are developing a smart Internet of Things (IoT) system to monitor critical meteorological and air-quality parameters in orchards in real time and accurately predict frost risk..

The system:

- Uses low-cost sensors to estimate the population of ice-nucleation-active bacteria on leaves, which increase frost risk.
- Integrates the tree's growth stage to improve prediction accuracy.
- Provides early alerts to support the timely implementation of protective measures and the prompt application of preventive copper-based treatments.

