LIFE FROSTDEFEND

Newsletter #2

April 2023

LIFE20 CCA/GR/001747

Rising risks of late-spring frosts

Climate Change can lead to altered patterns and increased incidences of extreme weather events which may cause large damage to ecosystems, threatening food security and the global economy. Among the weather risks, frost is responsible for severe crop losses.

The degree of crop frost damage depends on several factors such as the minimum temperature, the duration of the frost event and the developmental stage of plants, while frost risk also varies according to regional topographic, morphological and geographic features[1].

Thus, frost risk can be highly variable and difficult to predict[2].

The number of frost days in Europe has decreased since the 1980s, but with considerable year-to-year variability. This trend is set to continue in the future. Despite the overall decrease in frost days, the risk of frost damage faced by fruits and vegetable producers could increase in Europe and Asia because of an earlier start to the growing season[3].

Late-spring frost events (LSFs), frost events that occur after germination and budburst of herbaceous and woody plants, respectively, may have an important ecological and economic impact on agriculture.

A single LSF event across Europe in the spring of 2017 resulted in economic losses of €3.3 billion, with only 18% of the crops insured-but can also have further implications for food security, plant productivity and ecological interactions[3].

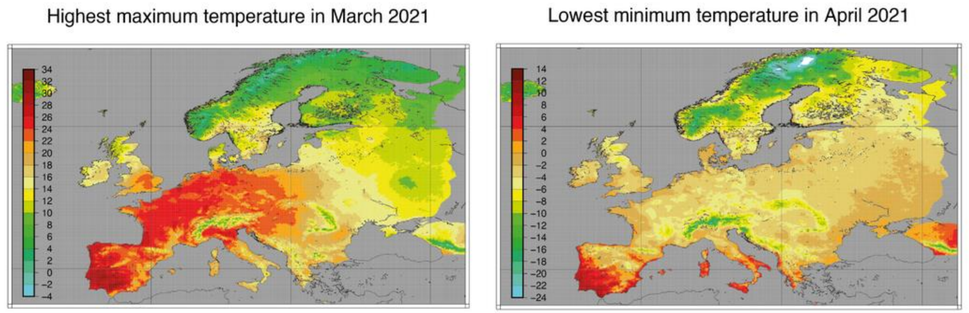
[1]Nat. Hazards Earth Syst. Sci., 14, 2375–2386, 2014
[2]Nature Climate Change, July 2021 , Vol 11, 554–555
[3]www.pnas.org/cgi/doi/10.1073/pnas.1920816117

Late spring frost events: April 2021

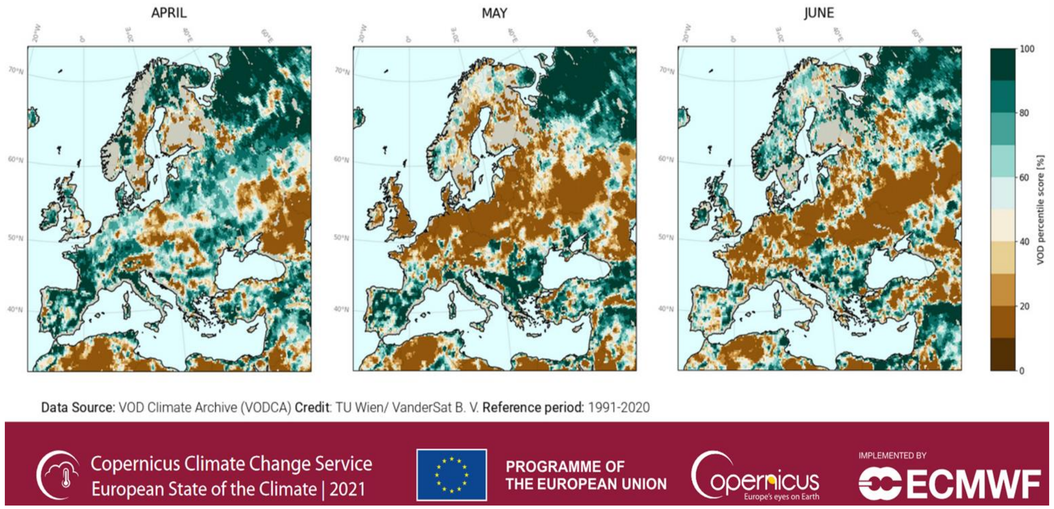
During the Spring of 2021[1], record-warm temperatures were observed across many parts of Europe (late March). The daily maximum temperature was at least 10 ºC for periods of more than ten days. These conditions triggered the onset of plant growth, meaning vegetation was at a developmental stage vulnerable to freezing.

Then, a week after the record-breaking high temperatures, the LSF in April caused severe damage to crops including vineyards and fruit trees across Europe.

In France, about 80% of the country's wine and fruit tree regions were affected, with the extent of the damage also substantial in Italy, in Greece and the UK[2].



Monthly ranking of Vegetation Optical Depth for April, May and June 2021[2]



[1]Nature Climate Change, July 2021 , Vol 11, 554–555
[2]https://climate.copernicus.eu/esotc/2021/late-spring-frost

January 2022 frost in Greece

A severe frost event occurred in January 2022 in the citrus-producing areas of Argolis, Laconia and Aeghialeia in Greece. In Argolis, temperatures dropped to – 7 °C for several hours. Damage to trees and fruits was aggravated because of power failures and the resulting inability to operate wind mixers to mitigate frost damage. Orange crop was severely damaged and fruits were sold for a significantly reduced price to orange juice plants. The Hellenic government subsidized farmers for crop losses with several million euros.

Meetings with stakeholders in Greece and in France

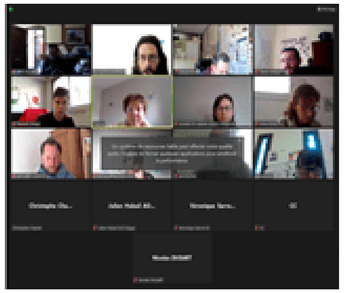
During the first year of the LIFE-FROSTDEFEND project, five meetings with stakeholders from Greece (Achaia, Argolis and Laconia) and France (Champagne, Auvergne Rhone Alpes, Provence Alpes Cote d'Azur) were organized (i.e. in total, 83 farmers participated in these meetings), aiming to:

- Identify the key stakeholders' needs and expectations (mapping of needs)
- Map the efficiency and effectiveness of the existing local agricultural practices for frost damage protection
- Discuss practical recommendations that will further support the efficient implementation of the project actions
- Inform the participants about the key objectives, the expected outcomes and the foreseen dissemination and replication activities of LIFE-FROSTDEFEND project

AGRICULTURAL COOPERATIVES' UNION – AEGHION S.A., 28/01/2022

ΑΝΥΦΙΟΝ A.E. Organic Agricultural Center, 25/02/2022

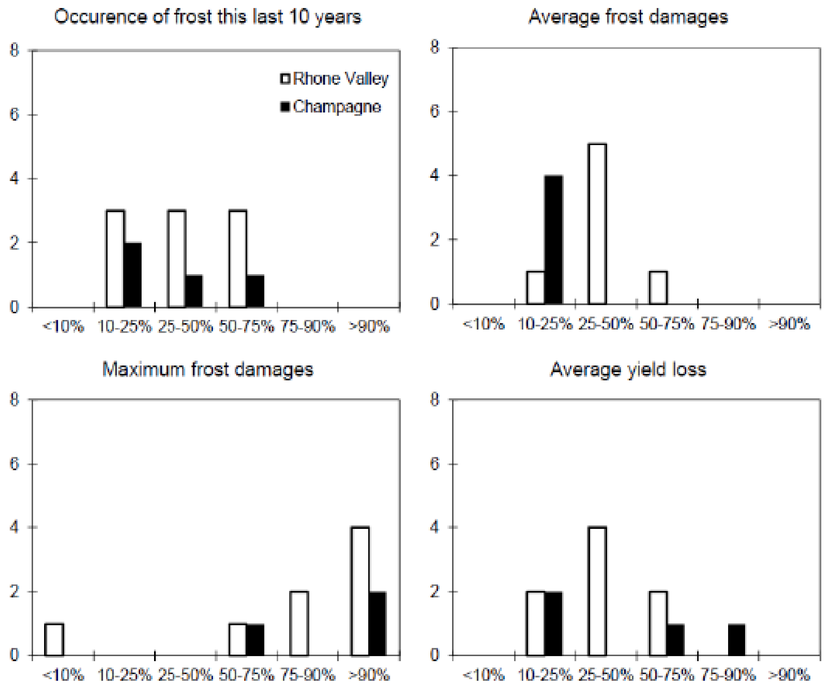
SPARTA VALLEY FRUITS S.A., 13/05/2022

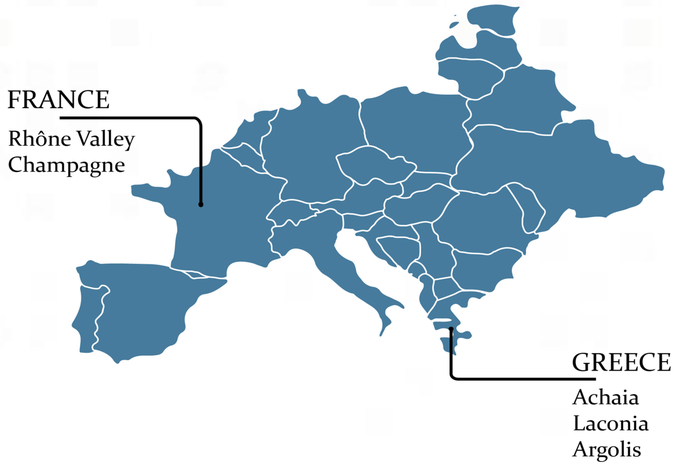


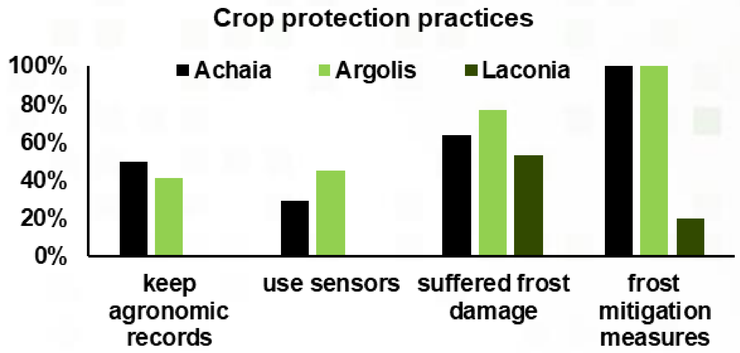
Virtual meetings in France with stakeholders from the Champagne and the Auvergne Rhone Alpes and Provence Alpes Cote d'Azur regions, 8 & 22/02/ 022

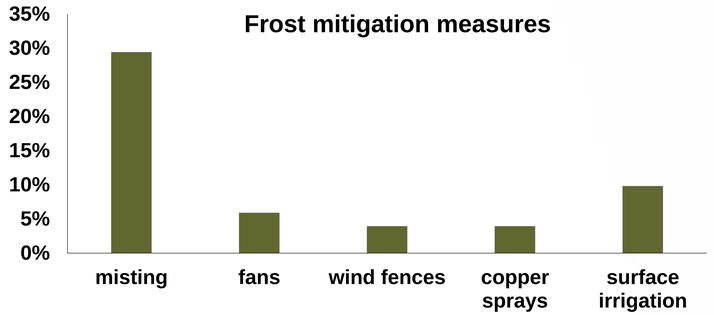
Analysis of the questionnaire responses

At the end of the meetings, the LIFE-FROSTDEFEND team presented and distributed questionnaires to the stakeholders to capture their feedback





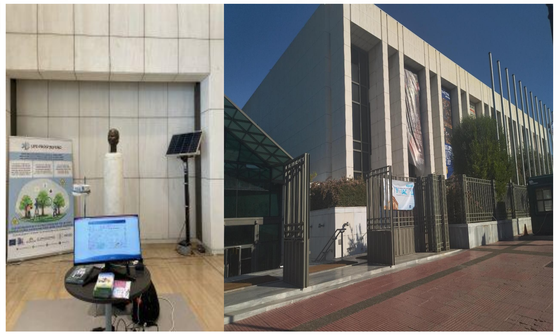




Dissemination actions of the LIFE-FROSTDEFEND

LIFE-FROSTDEFEND in the International Aerosol Conference 2022

The International Aerosol Conference 2022 took place at the Athens Concert Hall, from September 4th to 9th (https://iac2022.gr/). The conference was attended by more than 1000 delegates from Greece and 45 countries. mSensis (associate beneficiary of the LIFE-FROSTDEFEND project) participated as an exhibitor in the event.



LIFE-FROSTDEFEND in Beyond Expo 2022

LIFE-FROSTDEFEND was presented in the Beyond Expo 2022 (1st International Innovation Platform Beyond, https://www.beyond-expo.gr/), where mSensis participated as an exhibitor. The event took place from September 29th to October 1st in the International Exhibition Center of Thessaloniki.

Dissemination actions of the LIFE-FROSTDEFEND

LIFE-FROSTDEFEND in the 20th Hellenic Phytopathological Conference

LIFE-FROSTDEFEND presented its first preliminary results at the 20th Phytopathology Congress, https://20.phytopath.gr/ (3-6, October 2022, Thessaloniki, Greece). Our results attracted the great interest of all conference's attendees that included phytopathologists, agronomists, agronomy students and other scientists from all over the country.

LIFE-FROSTDEFEND in the workshop “Solutions to cope with frost, one of the climatic hazards difficult to neutralize with RLV (Riom Limagne Volcan)”

LIFE-FROSTDEFEND project was presented to local farmers in the workshop “Solutions to cope with frost, one of the climatic hazards difficult to neutralize with RLV (Riom Limagne Volcan)”organized by Vegepolys Valley (https://www.vegepolys-valley.eu/) on 25 November 2022.

LIFE FROSTDEFEND

Contact

NCSR Demokritos
Institute of Nuclear and Radiological Science & Technology, Energy & Safety
E-mail: frostdefend@ipta.demokritos.gr
Phone: +30 210 650 3008

More information on the website https://frostdefend.eu/en/

Life-FrostDefend

Life_FrostDefend

Life-FrostDefend

The project has received funding from the LIFE Programme of the European Union under GA number LIFE20 CCA/GR/001747. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

NATIONAL CENTRE FOR SCIENTIFIC RESEARCH "DEMOKRITOS"

ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
AGRICULTURAL UNIVERSITY OF ATHENS

INRAE
la science pour la vie, l'humain, la terre

AGRICULTURAL COOPERATIVES' UNION AEGHION S.A.

msensis