CLIMED-FRUIT

Adaptation to climate change and mitigation for perennial crops in Mediterranean Area

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Deliverable 5.10_List of recommended practical solutions to be further tested in additional OGs

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R	Document, report (excluding the periodic and final reports	x
DEM	Demonstrator, pilot, prototype, plan designs,	
DEC	Websites, patents filing, press & media actions, videos, etc.	
OTHER	Software, technical diagram, etc.	
Dissemination Level		
PU	Public, fully open, e.g., web	x
SEN	Sensitive, limited under the conditions of the Grant Agreement	
CO	Confidential, restricted under conditions set our in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

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More information on the project can be found at project website.

Project summary

CLIMED-FRUIT aims to share knowledge ready for practice, collected from different Operational Groups (OG) across Europe, for a better adaptation to climate change and mitigation, in perennial crops in the Mediterranean Area (grape vine, olive, fruits). The project builds on the results of a core group of 9 OG coordinated by a multi-actor consortium members (advisors, farmer organisations, research and education institutes, standardisation organisation), covering several Mediterranean crops in 7 different countries (France, Spain, Portugal, Greece, Italy, Croatia, Serbia). Best practices collected and shared range from (i) soil conservation and carbon storage, (ii) improving resilience of crops facing climatic hazards (frost, hail), (iii) innovative practices for adapting water stress management, (iv) adaption of food chain processes to climate change and diversification, and (v) preserving biodiversity for a better resilience to climate change issues and pests. These groups will share their experience through a combination of innovative digital formats, cross-visits and interactive local dissemination events. In addition, new knowledge and practices will be gathered more widely by organising an open contest. Participants from other European projects, other EIP OGs or even international projects from the Mediterranean area will be invited to propose abstracts. The most applicable solutions will be selected and pitched in a broad online conference. Participants will be invited to rank the best presentations according to cost/benefit ratio, which will then be widely disseminated and shared. Social media channels, videos, podcasts, crowd writing contests will be used to spread the knowledge. Specific editorial partnerships will be established with most popular technical reviews. The network will host a forum to capitalise on existing OG experiences and aims to foster new OGs to spread and explore new practical knowledge in relation to adaptation to climate change.

Objective and executive summary

The objective of WP5 – Sharing Information - is to implement communication and dissemination activities to share the information and practical knowledge collected by CLIMED-FRUIT network. Ultimately, the network aims to be continued after the project's duration by inspiring the creation of new OGs related to resilience and adaptation to climate change in perennial crops in the Mediterranean area. Deliverable 5.10 is the product of the activities done in task 5.8, whose text is here entirely reported: ***Task 5.8. Impulse the creation of new OGs (Task Leader: IFV, Participants: all partners):*** *Within the project duration, CLIMED-FRUIT partners will contribute to propose up to 5 new Operational Groups according to the opportunities of calls in the different countries. These new OGs will contribute to extending the impact of CLIMED-FRUIT after the project's duration by testing and demonstrating techniques or practical solutions in different geographical areas affected by climate change. Indeed, some areas are recently affected by climate change and can be inspired by solutions already implemented elsewhere. Based on CLIMED-FRUIT activities, a set of practical solutions that could be easily tested by EIP Operational groups/CAP networks will be listed as recommendations for potential OG coordinators (D5.8).*

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Process for identifying priority themes and practices

The identification of themes and practices with potential for further exploration in future Operational Groups was the result of a gradual, iterative process carried out throughout the project The process initially drew on the technical expertise of Climed-Fruit partners and the exchanges facilitated within the consortium, particularly during the *digital cross visits*. These sessions provided opportunities to share feedback on practices tested in partners' Operational Groups, both from approaches that proved unsuccessful and from promising innovations worth further investigation.

This preliminary list was subsequently refined and expanded through inputs gathered during the project's key dissemination and networking events. The *crowd writing contest* offered a broad overview of emerging, market-relevant innovations, while the web conference helped prioritise topics through the analysis of submitted abstracts and real-time audience voting. The final project conference, hosted by CIHEAM Bari (Italy), represented a final milestone in this process. On that occasion, the audience was directly invited to respond to the question: "For you, which practical solutions should be further explored through future Operational Groups?". This provided targeted recommendations with a strong territorial anchoring, ensuring that the selected practices are well adapted to the specific conditions of the Mediterranean region (Figure 1).

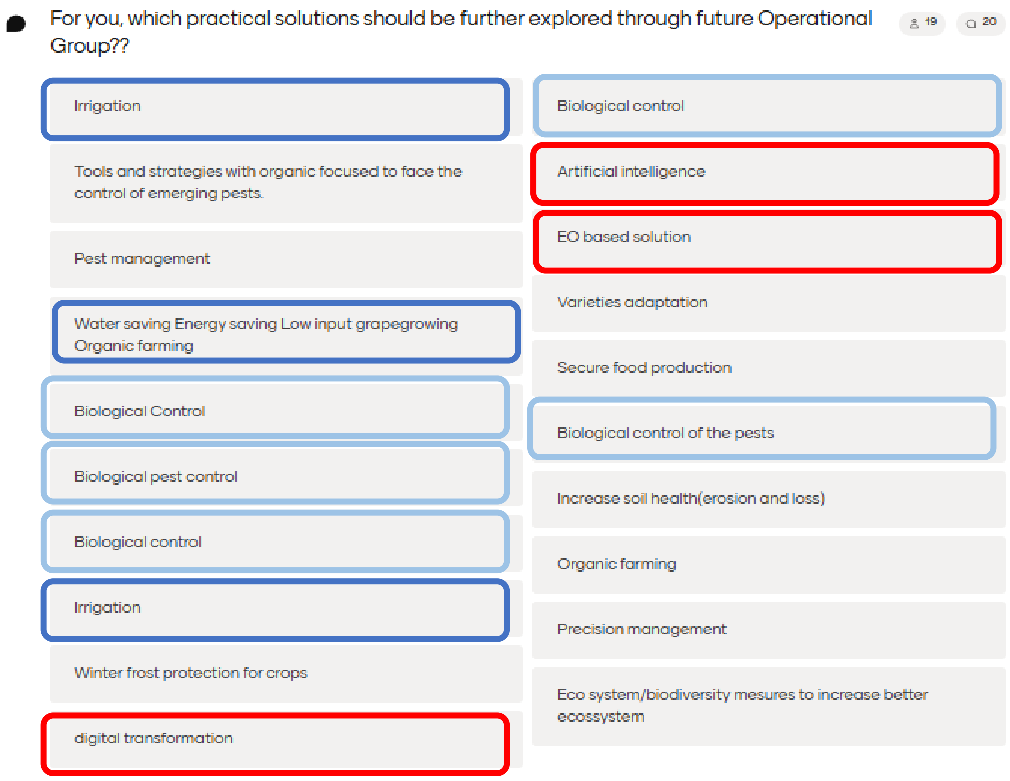

Figure 1: "Which practical solutions should be further explored through future Operational Group" - responses from participants at the final project conference in Bari in June 2025

The following section presents the set of practices identified through this process, which combine proven technical relevance with strong adaptation potential to the Mediterranean context.

Priority axes and practices

- **Biological pest control**
  → Strengthen the use of biological solutions to manage pests, especially in response to the emergence of new species, further optimising the integration of biocontrol measures within treatment strategies. Promising research and innovation pathways include the use of olfactory compounds to disrupt pest behaviour or attract them into on-field traps, the investigation of pest adaptations to biological control strategies, and the sustainable establishment of beneficial organisms within production systems.

- **Water-saving and low-input irrigation strategies**
  → Develop technical solutions and knowledge to enhance the resilience of rainfed agriculture to drought (e.g. shading, mulches, hydrogels), by integrating a focus on the sustainability and cost of the materials used (natural fibres, waste valorisation, short supply chains…).

  → Test water-efficient irrigation techniques suited to perennial crops and requiring minimal energy inputs. In the case of irrigation, beyond the adoption of smart systems and sensor technologies, sustainable water management also depends on improving farmers' understanding of soil characteristics and ensuring the regular maintenance of irrigation systems, in order to optimise water use and safeguard the resource.

  → Conduct trials on wastewater reuse as well as on collective, territory-scale solutions.

- **Digital and Data-Driven Solutions for Smart Crop Management**
  → Develop precision tools to reduce inputs and target interventions more effectively. Examples include remote sensing and multispectral imaging to detect water stress or pest outbreaks at an early stage; automated pest monitoring traps equipped with sensors or image recognition; and variable-rate application systems for fertilisers / plant protection products and water, allowing site-specific management and minimising environmental impact.

  → Integrate artificial intelligence and Earth observation technologies to monitor crops and anticipate risks. Examples include remote sensing and multispectral imaging to detect water stress or pest outbreaks at an early stage; decision-support systems integrating weather forecasts to optimise treatment timing; automated pest monitoring traps equipped with sensors or image recognition...

- **Soil health improvement practices**
  → Strengthen the knowledge base on cover crop management in Mediterranean conditions, with a specific focus on species selection, and on agronomic practices aimed at improving functional soil biodiversity.

- **Adaptation of varieties to climate change**
  → Continue the identification and testing of crop varieties (exploring underutilised or local genetic resources, foreign varieties…) better adapted to drought, heat stress, or newly emerging production areas, taking into account the specific characteristics of pedoclimatic contexts

- **Hail and frost protection systems**
  → Test and evaluate more sustainable, energy-efficient, and low-emission solutions for frost

and hail protection (e.g. hybrid frost towers, biomass- or plant-based wax candles, anti-UV treated nets, natural technical fibres…)

- **Ecosystem-based biodiversity enhancement measures**
  → Test mixtures of perennial and annual species adapted to Mediterranean seasonality (staggered flowering, drought tolerance) and measure their effect on beneficial insects, pollinators, and earthworms.

  → Further study how green infrastructures and organic amendments foster functional soil biodiversity (microbiome, mycorrhizae, earthworms) and translate into functional gains (water retention, soil structure, C/N cycling).

  → Define quick-to-use indicator sets (bioacoustics, camera traps, soil indices) for operational monitoring by advisers and farmers and integrate these data into decision-support platforms.

The newly established Operational Groups within the project effectively mirror the priority themes that emerged over its course: **7 new Operational Groups have been established in 4 different countries** since the launch of the project, partly as a result of the activities undertaken within Climed-Fruit. Their creation was stimulated by the project's exchanges on OG working methodologies, its recommendations for effective implementation and result-oriented approaches, as well as the thematic focus and practices identified within the project. These elements contributed to a better understanding of the specific needs and expectations of farmers across the Mediterranean region, thereby supporting the development of relevant and targeted OG initiatives:

- ✓ **ADAPTATIVE** (2024-2027): Adaptation techniques to climate change and operational protocols for viticulture in Emila Romagna. OG coordinated by VINIDEA in Italy.
- ✓ **RECYCL'EAU VIGNES** (2024-2027): Reuse of water in wineries and vineyards. OG coordinated by IFV in France.
- ✓ **HYDROSE** (2024-2027): Impact of hydric stress on quality of rosé wine. OG coordinated by IFV in France.
- ✓ **CEPOCLIM** (2024-2027): Vine plant material adapted to climate change. OG coordinated by IFV in France.
- ✓ **GO DRONSAFE** (2023-2027): Safe drone application of plant protection products, OG coordinated by AVA-ASAJA in Spain.
- ✓ **GO SUPERFOOD** (2024-2027): Restoring soil fertility and enhancing crop nutritional value for sustainable agriculture, OG coordinated by AVA-ASAJA in Spain.
- ✓ **GO "+DRONE"** (application deadline 8 July 2025): Efficient and safe use of drones to optimize agricultural production and reduce environmental impact, future OG (if approved) coordinated by APPITAD in Portugal.