

ACTIONS E: Project Management

Deliverable E2.1. After-life communication plan



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1 EXECUTIVE SUMMARY

Deliverable E2.1. After-life communication plan summarises the strategy to ensure the dissemination and knowledge transfer after the end of the PERFECT Life project. In the present document, we set all the activities to keep increasing the project's scope and disseminating the benefits obtained during its implementation.

This After-Life plan contemplates, on the one hand, the continuity of the dissemination, raising awareness and education campaigns, and, on the other hand, the broadcasting of the project's technical results, as well as the technologies and tools used and developed in the frame of the project, to reduce the environmental contamination of pesticides and their metabolites in the air in two of the most important 3D crops in the Mediterranean basin, citrus and vineyards.

2 INTRODUCTION TO THE PROJECT

The PERFECT LIFE (Pesticide Reduction using Friendly and Environmentally Controlled Technologies) demonstrated the reduction of environmental contamination due to the presence of pesticides and their metabolites in the air using a group of technologies and techniques to encourage farmers and stakeholders towards sustainable agricultural practices, from the environmental point of view, because they lead to a decrease of the pesticide risk for fauna, flora, and humans, and from the economical and social points of view, because they also reduce the cost of crop protection labours (Figure 1).

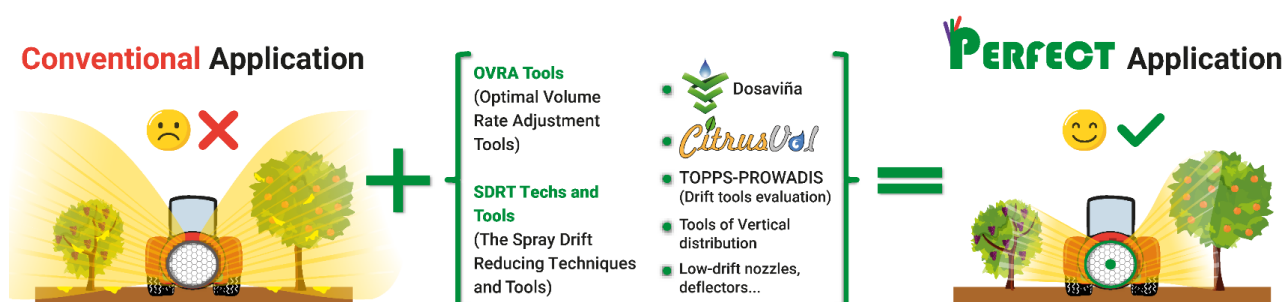


Figure 1. Infographic created to show the benefits of the tools and techs used in the PERFECT Life project.

The current deliverable (E2.1) summarises the After-Life Plan created in order to ensure proper exploitation of the results and to set out the planning for the continuous dissemination and communication of the project results, as well as the technologies and tools used and developed in the frame of the project.

3 GENERAL INFO

- **PROJECT TITLE:** Pesticide Reduction using Friendly and Environmentally Controlled Technologies (LIFE 17 ENV/ES/000205)
- **DURATION:** 1st September 2018 – 31st August 2023
- **TOTAL BUDGET:** 2,017,669 € (EU contribution 1,194,287 €)
- **SECTOR:** Environment and Health
- **PARTNERS:** CEAM (Coordinator), IVIA, FISABIO, UMA-UPC, CACV, DISAFA, IFV and FIT

4 OBJECTIVES OF THE PROJECT

The main goal of the PERFECT project is to reduce pesticides and their metabolite contamination by adopting easy-to-use tools and technologies during spray application in citrus and vineyards,

without affecting the effectiveness of the treatments. These easy-to-use tools and technologies are classified into two groups:

- OVRA TOOLS (Optimal Volume Rate Adjustment Tools): Including DOSAVIÑA®, developed for vineyards, and CITRUSVOL, developed for citrus.
- SDRT TECHS AND TOOLS (The Spray Drift Reducing Techniques and Tools): Including tools for evaluation of drift risk and of vertical spray distribution, , low drift nozzles, air deflectors, etc.

The project implementation has proven a decrease in the pesticide risk for fauna, flora, and people. Furthermore, a new, sensitive, and time-resolved technology for the analysis of pesticides has been developed to assess the application of pesticides from a health standpoint, in real agricultural conditions.

Besides, the project has achieved the following specific objectives:

- To demonstrate the efficacy of OVRA tools and SDR tech and tools.
- To establish a holistic procedure for PPP spray applications with low emissions and impacts.
- To promote the sustainable use of PPP.
- To improve the knowledge of farmers and users.
- To evaluate human health threats with risk assessments and identify human biomarkers.
- To identify chemicals and secondary pollutants.
- To develop a new tool to measure pesticides under field conditions.

5 Lessons learned from project implementation and the need for follow-up

PERFECT LIFE project has developed a holistic approach to applying plant protection products in an optimised way in vineyards and citrus orchards. We demonstrated that the use of Optimal Volume Rate Adjustment Tools (OVRA) and Spray Drift Reducing Techniques and Tools (SDRT) can reduce very significantly the drift of pesticides and consequently decrease the risk of pesticide exposure for human health and the environment (Figure 2).

All the outcomes of the project can be extrapolated and replicated in any other arboreal crops reducing the pesticide exposure of farmers and bystanders. The PERFECT LIFE project has been implemented at a local level in Spain, France, and Italy, providing a good experimentation basis, and showing the benefits of using easy-to-use techs and tools to reduce the drift and exposure problem of pesticide applications.

Based on all the field trials and experimentation carried out in the frame of the project we can verify the following environmental and socio-economic benefits of using the easy-to-use tools and technologies of the project compared with conventional applications mostly performed by farmers and operators:

➤ **Cost savings**

Citrus:

- Fuel saving: 46-804 l / 100 ha
- Time saving: 5 – 97 h / 100 ha
- Plant Protection Products saving: 12 – 74 %

Vineyards:

- Fuel saving: 83 – 1063 l / 100 ha
- Time saving: 3 - 19 h / 100 ha
- Plant Protection Products saving: 30 – 35 %

➤ **Environmental: air pollution**

Citrus:

- Reduction of pesticide losses: 12 – 74 %
- Reduction of CO2 emissions: 119 – 2099 kg / 100 ha

Vineyards:

- Reduction of pesticide losses: 72 %
- Reduction of CO2 emissions: 217 – 2775 kg / 100 ha

➤ **Health: Risk assessment (Reduction of human exposure)**






Citrus:

- Inhalation: 84%
- Dermal: Adult bystanders (82%), Child bystanders (82%), Operators (92%)
- Metabolites in urine: Adult bystanders (59%), Operators (78%)

Vineyards:

- Inhalation: 65%
- Dermal: Adult bystanders (64%), Child bystanders (64%), Operators (56%)
- Metabolites in urine: : Adult bystanders (59%), Operators (69%)

✓ Specific outcomes

- Economical benefits:  Fuel saving (46-804 l/100 ha)  Time saving (operator+tractor) (5-97 h/100 ha)  Pesticide saving (12-74%)
- Environmental benefits:  Reduction of pesticide emissions (12-74%)  Reduction of CO₂ emissions (119-2099 kg/100 ha)

✓ General outcomes

- The implementation of the easy-to-use tools and technologies used in the PERFECT project will lead to **cleaner environments for people and agro-ecosystems**.
- Conventional **pesticide treatments** led always to greater losses and higher risks than **optimised treatments**.
- **Knowledge and dissemination** are the **keys** to reach our goal.

Figure 2. Picture summarizing the main benefits of the PERFECT Life Project.

The biggest challenge faced during the project implementation was to disseminate and prove to farmers and operators the benefits of adopting our tools and techs in their regular pest management practices. For this reason, we designed a broad plan of dissemination and communication while the project was still being implemented to guarantee visibility and transferability at the EU level, allowing the public and private sectors to be aware of the project's results and promoting the use of such results in the field of EU policy and legislation.

However, we will continue with the dissemination, raising awareness and education campaigns to keep showing farmers, operators, and the rest of the stakeholders the benefits of the project to increase its reach. This is a hard task and needs to rely on a programmed strategy. Hence the need for the present After-Life plan.

6 ACTIONS AFTER LIFE

The actions planned for the 5 years of the After-LIFE period (Sept 2023-Sept 2028) are set out below, with the aim of increasing the scope and giving continuity to the benefits obtained by the project.

This plan contemplates, on the one hand, the continuity of the dissemination, focussing the efforts mainly on farmers and operators, but also on the general public and other stakeholders like policymakers, companies, PPP manufacturers, etc.

On the other hand, this plan aims to ensure the maintenance of the techs and tools used in the frame of the project, to reduce the environmental contamination of pesticides and their metabolites in the air in two of the most important 3D crops in the Mediterranean basin, citrus and vineyards.

6.1 Dissemination, raising awareness and education

One of our biggest challenges during the project implementation has been to disseminate and convince farmers and operators about the benefits of adopting our tools and techs. For this reason, we planned a road map to disseminate and communicate the benefits of the project during and after its implementation, to guarantee visibility and transferability, allowing the public and private sectors to be aware of the project's results and promoting our outcomes.

Based on what we have learned during the project, the practical and face-to-face actions such as the demo- and training- days have been the more effective activities. We are going to keep active and online all the dissemination material developed during the implementation of the project such as the webpage, the guides for the sustainable application of pesticides, the online course, as well as the rest of the items named below. We are going also keep working with farmers and operators, sharing with them all the results in the regular training activities performed by all the partners, where the developed guides will continue to be distributed, as well as the training on the use of the tools developed during the project.

Hereafter we enumerate all the points, in terms of dissemination and raising awareness, that will be active during the 5 years of the After-Life plan:

- **Maintenance and update of the Project website:** Reports, deliverables and links to the more important information generated during the project execution and the tools and technologies used and generated during the project can be found on our webpage: <https://perfectlifeproject.eu/>
- **Social Media:** All the network profiles created at the beginning of the project (Twitter, Facebook, Instagram and YouTube) will maintain their function of providing immediate information about the development of the project and information related to sustainable use of pesticides for at least the next 5 years.
- **Tutorial videos and YouTube channel:** The channel on YouTube with all the audiovisual material will remain active: <https://www.youtube.com/@perfectlifechannel7618>
- **Guides for sustainable application of pesticides in citrus and vineyards:** Two guidelines were developed, one for citrus producers and another for wine growers. Both can be found on the website of the project:
 - <https://perfectlifeproject.eu/wp-content/uploads/2023/04/Guia-para-VINEDO-ULTIMA-VERSION.pdf>
 - <https://perfectlifeproject.eu/wp-content/uploads/2023/04/Guia-Final-para-CITRICOS.pdf>

The results acquired during the LIFE PERFECT project will also be partially used in the construction of practical sheets for French winegrowers about drift reduction techniques, for a release planned in the beginning of 2024.

- **Online training course:** This course was not foreseen in the project proposal but due to the COVID-19 lockdown and all the restrictions we considered that having an electronic course can solve partially the impossibility of performing courses in presential mode. This course is hosted on the Cooperatives website and will be there until the end of the After- Life period: <http://www.cooperativesagroalimentariescv.com/perfect-life/>
- **Leaflets, roll-ups, informative panels, and merchandising:** All the dissemination material generated during the project is available to both the project coordinator and the other partners. They can use it in all the meetings, seminars, and/or workshops they attend, disseminating the objectives and results of the project.
- **Promotional video:** We produced a video in all the languages used in the project (English, Spanish, French and Italian) to facilitate the broadcasting of the project. The video has also two versions, an extended version of around 8 minutes which explains in detail the project and also a short version of one minute where the basics of the project are shown. All the videos can be watch on the Project's YouTube channel: <https://www.youtube.com/@perfectlifechannel7618>
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6.2 Maintenance of the techs and tools

During the project implementation, thanks to the funds provided by the Life programme and the participating partners, different electronic tools and/or Apps have been updated, developed, or adapted to different EU scenarios and languages.

All those tools are described below and will continue available and updated by the project partners.

- **Dosaviña:** Dosaviña® is a tool to determine the optimal application volume in pesticide spray applications in vineyard based on training system (goblet, pergola, or trellis), canopy size (height and width), leaf density (four levels of density) and the sprayer used (different type of sprayers according to the specific training system). Allows to determine the suitable parameters for a correct spray application: forward speed, working pressure, type, and number of nozzles. It can also be used for the calibration and adjustment of equipment in other tree/bush crops. At the end of the process, an easy-to-share report is produced. Dosaviña® APP is available for IOS and Android smartphones and for webpages (<https://dosavina.upc.edu/>). Dosaviña® has been developed by the Agricultural Mechanization Unit of the Universitat Politècnica de Catalunya.
- **Citrusvol:** This App offers a calculator to recommend the optimal spray application volume (l/ha) to be used for PPP treatments with an air-blast sprayer in adult citrus plantations, considering the following information: the size of the trees, the planting frame, the leaf density, the level of pruning, the pest or disease and the PPP (<https://citrusvol.com>). Furthermore, this App has two tools to help users to calibrate their air-blast sprayer. One of them helps users to select the nozzles. For that, calculates the average flow rate of the nozzles needed to apply the spray volume rate decided by the user at a certain forward

and orchard row spacing chosen by the user (<https://citrusvol.com/caudal-de-boquillas/>). The other calibration tool allows users to calculate the spray volume rate that is applied by the sprayer with a given nozzle configuration, forward speed and orchard row spacing (<https://citrusvol.com/calculo-de-volumenes/>). This App has been developed by the Valencian Institute of Agricultural Research (IVIA) and it is based on a scientific basis.

- **TOOPS-Prowadis drift evaluation tool:** The tool evaluates the risk of PPP spray application in orchards and vineyards according to climatic and operative and management conditions. It helps farmers and technicians to understand the factors influencing spray drift during PPP applications and indicates how mitigation measures can be used to reduce it (www.TOPPS-drift.org). It was developed within the European TOPPS-PROWADIS project with the collaboration of experts and scientists from seven countries.
- **CITRUS TOOPS tool:** TOPPS-PROWADIS Drift Evaluation Tool for Citrus. The tool evaluates the risk of PPP spray application in citrus where climatic and operative and management conditions are different to orchards and vineyards (<https://citrus.topps-drift.org/>). The citrus evaluation tool was developed as an extension of the European TOPPS project (www.TOPPS-drift.org) within the framework of the PERFECT Life project by IVIA and DISAFA with the collaboration and support of the European Crop Protection Association (ECPA).
- **VINEYARDS VERTICAL SPRAY PATTERN (VESPA) tool:** This tool forecasts the vertical spray distribution pattern of air-blast sprayers according to the sprayer settings and to vineyard characteristics and helps vineyards farmers and technicians how to adjust the spray cloud to improve the efficiency of the application and reduce PPP losses (<https://www.laboratorio-cpt.to.it/diagramma-atomizzatori-v-2/?lang=en>). This tool was developed by DiSAFA.
- **CITRUS VERTICAL SPRAY PATTERN (VESPA) tool:** This tool predicts the vertical spray profiles of the most common air-blast sprayers and their settings employed in citrus orchards. According to sprayer type, nozzle type, number of active nozzles and setting of the fan airflow rate, it is proposed a probable vertical spray profile generated based on experimental tests carried out using ad hoc test benches. This tool helps citrus operators in selecting the sprayer configuration to adopt on their own machine to achieve the intended spray profile and to reduce spray losses out of the target (<https://www.laboratorio-cpt.to.it/citrus-vertical-spray-pattern/?lang=en>). The tool was developed within the PERFECT project by IVIA and DiSAFA.

6.3 Face-to-face meetings and courses

As mentioned above, the biggest challenge we faced during the implementation of the project was to disseminate and convince farmers and operators about the benefits of adapting our tools and technologies. The most effective actions have always been the face-to-face meetings and the demonstration workshops where the audience can see in person the benefits of our tools and techs. Therefore, we need to continue with this type of activity such as participation in conferences, fairs, and other events.

Hereunder we enumerate some of the activities planned to keep active after the project ends in terms of meetings, dissemination, and knowledge transferability:

- **Presentations** of the project results in national and international meetings and conferences. All partners have included in their work routine the presentations of their results in meetings or conferences, so the PERFECT Life project will continue to be presented in this type of actions such as: *International Agricultural and Gardening Machinery Exhibition* (EIMA) taking place in Bologna (Italy) every two years, *Feria Internacional de Maquinaria Agrícola* (FIMA) taking place in Zaragoza (Spain) every two years, and *International Exhibition of Technologies and Solutions for Efficient and Sustainable Agriculture* (SIMA) taking place in Paris every two years, as well as scientific meetings such as the biannual conference on *Pesticide Behaviour in Soils, Water and Air* York/Piacenza Pesticide Conference, Biannual Workshop on *Spray Application and Precision Technology in Fruit Growing* (SuproFruit), Biannual conference on *International Advances in Pesticide Application* (IAPA), etc. Presentation of results are already submitted to SuproFruit 2023 and IAPA 2024.
- CACV has integrated the objectives and results of the project in their annual courses they offer to farmers to obtain their compulsory **pesticide handler licence** . CACV certifies the pesticide handler courses, qualified level, in the Valencian Region to obtain the licence compulsory to carry out pesticide treatments.
- IFV will continue to promote results of the LIFE PERFECT project in their courses for winegrowers, students and advisors. The next training sessions are already scheduled for November 7 and 8, 2023, and others will follow in the coming years as needed.
- **Networking:** The PERFECT Life project has been very active in many national and international meetings, and also in events specifically meant to networking with other EU projects such as Life but also, Horizon Europe and others, so the partners will continue this activities because those meetings are a great opportunity to meet other researchers and technicians working in projects with similar scope. A demonstration about Spray Drift Reducing Techniques and Tools will be held as part of the next Suprofruit workshop, scheduled for Montpellier in September 2023.