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Turning climate-related information into added value for traditional **MED**iterranean **G**rape, **OL**ive and **D**urum wheat food systems

Deliverable 2.4

Assessment of the added value for the decision-making process for the olives/ olive oil sector



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Executive summary

WP2 is about Co-designing climate services for the olive and olive oil sector and it consists of four main tasks:

Task 2.1: Appraising needs and critical decisions

Task 2.2: Developing the tool

Task 2.3: Testing the tool

Task 2.4: Assessing the added value of the pilot service to the user

Key decisions for the management of the olive crop and users' needs were identified via a workshop that was held in Spain in 2018 (task 2.1). Twenty agronomists from DCOOP attended as the potential users of climate information in olive sector to identify Olive sectors' key decisions and climate information needs (Del.2.2). Climate service tools were developed based on the users' needs assessment in task 2.2. Then, a second workshop was held to present the tools in May 2019 in Spain (Del 2.6). Task 2.3 aimed to test the tools through an online survey and a workshop which was conducted in May 2020.

In task 2.4 we engaged with the DCOOP agronomists to assess the added value of the Olivia platform and the MED-GOLD dashboard for the olive sector for their decision-making. An online survey and workshop have been used to assess the added value of using Olivia platform and dashboard accordingly. The survey and workshop were designed based on an adapted conceptual framework for the assessment of the added value of climate services. The framework has been described in section 6.2.1.

The result shows that participants believe that the Olivia platform has been designed for only one pest (Olive fly fruit) which is not harmful in all areas and it needs to consider other pests as well. Regarding the dashboard added value assessment, they discussed that this version of the Dashboard will be only useful for a minority of users in the olive sector as it is not intuitive enough for some users especially farmers. Therefore, they suggested simplifying the tool can increase its usability by different user profiles.



1. Objectives

With this deliverable, the project has contributed to the achievement of the following objectives (DOA, Part B Table1.1):

Table 1.1. project objectives

No.	Objective	Yes
1	To co-design, co-develop, test, and assess the added value of proof-of-concept climate services for olive, grape, and durum wheat	x
2	To refine, validate, and upscale the three pilot services with the wider European and global user communities for olive, grape, and durum wheat	x
3	To ensure replicability of MED-GOLD climate services in other crops/climates (e.g., coffee) and to establish links to policy making globally	
4	To implement a comprehensive communication and commercialization plan for MED-GOLD climate services to enhance market uptake	
5	To build better informed and connected end-user communities for the global olive oil, wine, and pasta food systems and related policy making	

2. Impact

This deliverable aims to assess the added value of Olivia platform and Dashboard as a MED-GOLD climate services in WP2' decision-making. This could help to identify obstacles and ensure sufficient engagement with end users in the development and dissemination of climate services.

Table 2.1. Expected impacts of the deliverable

No	Expected impact	Yes
1	Providing added-value for the decision-making process addressed by the project, in terms of effectiveness, value creation, optimised opportunities and minimised risk	x
2	Enhancing the potential for market uptake of climate services demonstrated by addressing the added value	
3	Ensuring the replicability of the methodological frameworks for value added climate services in potential end-user markets	
4	To implement a comprehensive communication and commercialization plan for MED-GOLD climate services to enhance market uptake	
5	To build better informed and connected end-user communities for the global olive oil, wine, and pasta food systems and related policy making	



3. Definitions

Concepts and terms used in this document and needing a definition are included in the following table:

Table 3.1. Definitions

Term	Definition
Climate service	Climate Services involve the (co-)production, transfer, and use of tailored climate information products to improve decision-making at different scales (Vaughan and Dessai, 2014).
Value	The word 'value' has been defined as the range of benefits (economic and/or non-economic) that can be gained from using climate information in decision-making (Bruno Soares et al., 2018).
Usability	Cash et al. (2003) have defined three main criteria for usability which are: credibility, saliency and legitimacy (Lemos 2008; McNie 2007, 2013; Lemos et al., 2012; Lemos et al., 2018; VanderMolen et al, 2020).

4. Acronyms

Acronyms used in this document are defined in table 4-1:

Table 4.1. Acronyms

Acronym	Definition
MED-GOLD	Referring to the project entitled "Turning climate-related information into added value for traditional MEDiterranean Grape, OLive and Durum wheat food systems"
WP	Work Package
RD	Reference documents

5. References

The following documents, although not part of this document, amplify or clarify its contents. Reference documents are those not applicable and referenced within this document. They are referenced in this document in the form [RD.x]:



Table 5.1. Reference Documents

Ref.	Title	Code	Version	Date
[RD.1]	Bruno Soares M, Alexander M, Dessai S .2018. Sectoral use of climate information in Europe: a synoptic overview. <i>Climate Service</i> 9:5–20.			2018
[RD.2]	Lemos MC .2008.What influences innovation adoption by water managers? <i>Climate information use in Brazil and the United States. JAWRA J Am Water Resour Assoc</i> 44(6):1388–1396.			2008
[RD.3]	Lemos, M. C., K. S. Wolske, L. V. Rasmussen, J. C. Arnott, M. Kalcic, and C. J. Kirchhoff, 2019: The Closer, the Better? Untangling Scientist–Practitioner Engagement, Interaction, and Knowledge Use. <i>Weather. Climate Society.</i> , 11, 535–548, https://doi.org/10.1175/WCAS-D-18-0075.1 .			2018
[RD.4]	McNie EC .2007. Reconciling the supply of scientific information with user demands: an analysis of the problem and review of the literature. <i>Environment Science Policy</i> 10(1):17–38. https://doi.org/10.1016/j.envsci.2006.10.004 .			2007
[RD.5]	Robinson J, Tansey J .2006.Co-production, emergent properties and strong interactive social research: the Georgia Basin Futures Project. <i>Sci Public Policy</i> , 33(2):151–160.			2006
[RD.6]	Tall, A. Coulibaly, J.Y. Diop, M. 2018. Do climate services make a difference? A review of evaluation methodologies and practices to assess the value of climate information services for farmers: Implications for Africa. <i>Climate Services</i> 11: 1–12. https://doi.org/10.1016/j.cliser.2018.06.001 .			2018
[RD.7]	Tall, A., and Njinga, J. 2013. Developing a methodology to evaluate climate services for farmers in Africa and South Asia workshop report. Copenhagen, Denmark: CGIAR Program on Climate Change, Agriculture and Food Security. Retrieved from www.ccafs.cgiar.org .			2013
[RD.8]	VanderMolen, K. Meadow, A.M. Horangic, A. Wall, T.U. 2020. Typologizing Stakeholder Information Use to Better Understand the Impacts of Collaborative Climate Science. <i>Environmental Management</i> 65:178–189 https://doi.org/10.1007/s00267-019-01237-9 .			2020
[RD.9]	Vincent, K., Daly, M., Scannell, C., Leathes, B., 2018. What can climate services learn from theory and practice of co-production? <i>Clim. Serv.</i> 12, 48–58.			2018
[RD.10]	Vincent, K., Conway, D., Dougill, A.J. Pardoe, J. Archer, E., Bhave, A.G., Henriksson, R., Mittal, N., Mkwambisi, D., Rouhaud, E., Nhleme, DT. Re-balancing climate services to inform climate-resilient planning – A conceptual framework and illustrations from sub-Saharan Africa. <i>Climate Risk Management</i> 29 (2020) 100242.			2020
[RD.11]	Vogel, J., Letson, D., Herrick, C. 2017. A framework for climate services evaluation and its application to the Caribbean Agrometeorological Initiative. <i>Climate Services</i> , 65–76.			2017



6. Detailed report

6.1. Co-developing a climate service for the Olive and olive oil sector

Work Package 2 (WP2) aim was to co-develop a climate service(s) in the Olive and Olive sector through the direct engagement with DCOOP, the biggest olive and olive oil cooperative in Andalusia, Spain. This WP had four main tasks as follows:

Task 1 - Assessing the needs/decisions of the Olive and olive oil sector (DCOOP)

In order to assess climate information needs and key decisions in DCOOP, a participatory workshop was held in June 2018. Participants were 20 agronomists from Field Technical Department (FTD) of DCOOP. The workshop result showed that:

- DCOOP participants were more interested in seasonal forecasts of bioclimatic indices than in long-term climate projections, indicating that they were interested in the short term than the long-term;
- The participants commented that they were more interested in quantitative data than maps or graphics;
- The graphics presented during the focus group were difficult for them understand and they mentioned that farmers and technicians wouldn't be able to use them to prepare the phytosanitary treatment.

More information on this task and outputs can be found in Deliverable 2.1

Task 2 – Developing the tools

Following the initial findings from task 1, three tools were designed, developed and improved in accordance to the needs and the continuous feedbacks received from DCOOP users, including:

- **Olivia platform** - a web platform, available to the member farmers, which includes a predictive pest management support system based on artificial intelligence. The tool was presented at the MED-GOLD workshops in April 2019 [RD.1] and May 2020 [RD.2] to obtain feedback from DCOOP technicians and users.
- **Dashboard** - a horizontal tool to be utilized across all three crops studied in the MED-GOLD project. of the dashboard contains various indices relevant to the olive and oil sector , such as the number of days with temperature above 32°C (Spr32), Mean spring maximum temperature (Sprtx), Summer heat days threshold: 36 °C (Su36), Number of summer heat days, threshold: 40 °C (Su40), Total winter precipitation (WINRR).

It is worth mentioning that the dashboard tool has been entirely developed in the framework of the MED-GOLD project, whereas the Olivia platform is a tool developed by a private service provider that has adapted it to also use seasonal predictions within MED-GOLD.



- The physiologically based demographic model (**PBDM**) – a model that predicts the geographical distribution and relative abundance of the olive fruit fly pest across time and space. The added value of PBDM generally accrues in terms of regional recommendations for crop management as opposed to precise prediction at field level. As a result, this tool was not assessed in terms of its value and benefits to the DCOOP users.

More information on this task and outputs can be found in Deliverables 2.2

Task 3 – Testing the tools

Two workshops were held to test the Dashboard in Spain. The first workshop was held in May 2019 and the second one in May 2020. The users’ feedback has been summarised in table 6.1.

Table 6.1. DCOOP users’ feedback on the first version of the Dashboard

DCOOP users’ feedback		final version’s result
1	Errors in loading information and showing it on the map	Fixed
2	The JPEG picture with the map of SprR as downloaded includes no legend	Fixed
3	JPEG map is difficult to interpret, and it was suggested to include the boundaries of Andalusian province, which might help interpretation.	Not fixed
4	Participants could not handle GeoJSON and NetCDF file formats and would prefer Excel format	Fixed (export data in CSV that Excel can open)
5	Participants are interested in getting the results of each year in a spreadsheet format"	Fixed (bar chart can be exported to CSV)
6	Participant suggested making the downloaded JPEG more attractive by applying a colour legend to bars of bar chart	Fixed
7	Exported JPEG map needs more information about e.g., the type of data or climatic variable selected	Fixed
8	The participants suggested that the dashboard should include the option to create a report collecting all the information navigated by the user up to that point	Not fixed
9	The participants asked if the historical climate data would be updated regularly year after year.	Fixed
10	They asked the dashboard provides the source of data in Historical Climate Panel.	Fixed
11	Accessing the raw data for historical climate maps as spreadsheets, for example, in Excel format	Fixed (available in the dashboard through export map data as CSV);
12	The participants asked if the indices suggested in the 2019 focus group meeting has been computed and whether they would be shown in the final version of the dashboard.	Many of the indices have been included in the current version
13	They suggested new bioclimatic indices of interest, specifically related to olive fruit ripening.	Not fixed



14	Regarding the olive fruit fly attack, the participants suggested that the number of hot days in summer (temperature above 40 °C) should be added to the dashboard.	Fixed??
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More information on this task and outputs can be found in Deliverable 2.7

Task 4 – Assessing the value of the tools

In task 4, the added value and benefits of the final version of the Olivia platform and the Dashboard in the olive and olive oil sector were assessed. The methods used to pursue this assessment are explained in section 6.2 below followed by the results in section 6.3.

6.2. Methodology used to assess the value of the Olivia platform and the Dashboard

The assessment of the added value and benefits of the tools developed was based on a conceptual framework developed for that purpose which is explained in the next section (6.3.1) and implemented through an online-survey and workshop.

- Online survey to assess the added value of the Olivia platform;
- Online workshop to assess the added value of the Dashboard.

The assessment helped understand how usable and practical the tools are in supporting and informing the users activities and decisions in the olive and olive oil sector.

6.2.1 Conceptual framework for assessing the value of the tools

Although some studies consider accessibility and understandability as a way to define useful climate services (Tall and Njinga, 2013; Tall et al., 2018) this in itself has often not translated into use of climate information in decision-making (Lemos et al., 2012; Vincent et al., 2018). This means data availability is only a requirement for using data in decision-making and usability goes well-beyond availability (Vincent et al., 2020). Cash et al. (2003) have classified all usability factors into three main criteria that make information to be usable in decision-making which are credibility, saliency and legitimacy (Lemos 2008; McNie 2007, 2013; Lemos et al., 2012; Lemos et al., 2018; VanderMolen et al, 2020).

Saliency refers to factors such as timeliness of the climate information, spatial scale, appropriate selection of variables, and understandable presentation format (visualisation). This factor means the information needs to be relevant to a decision maker’s problem (Gettelman, Rood, 2016). Credibility refers to the quality of scientific information as judged by the standards of the scientific community. It relates to aspects of accuracy, reliability and quality of the data (VanderMolen et al., 2020). Legitimacy is derived from the process used to produce the information, which must be free from any bias and perceived to be transparent by



stakeholders (Cash et al. 2006; Lemos 2008; McNie 2007, 2013). A two-way engagement between users and providers of information, can help building legitimacy and transparency (Robinson and Tansey, 2006; Vincent et al., 2018; Vincent et al., 2020).

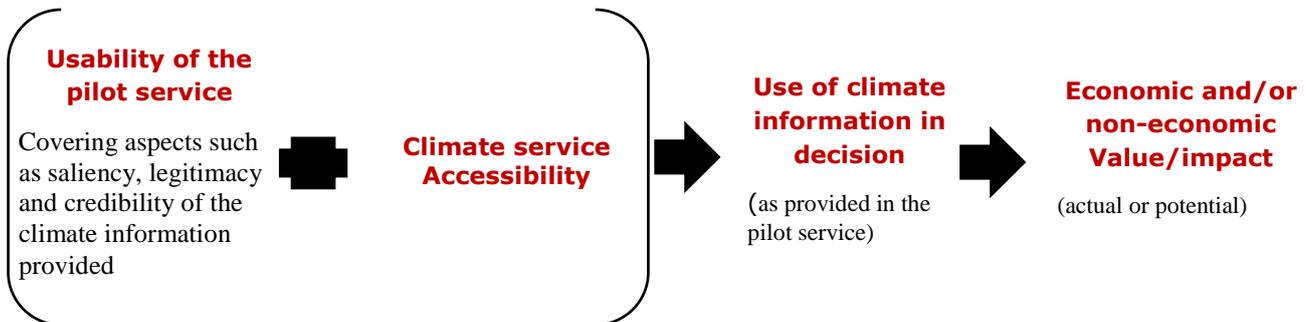


Figure 6.1 Adapted conceptual framework to assess the usability of the MED-GOLD pilot services

6.2.2 Survey to assess the value of the Olivia platform

In order to assess the usability of the Olivia platform in the Olive and olive oil sector, the conceptual framework was translated into questions that fit an online survey structure (Annex 1). The survey was then translated into Spanish and implemented online using the software Survey Monkey. The online survey was disseminated in August 2020 to DCOOP technicians and EC2CE Agronomists to assess the platform usability in their decision-making. However, due to low responses from DCOOP users and EC2CE Agronomists, the Andalusian government was asked to help disseminate the survey to other users operating in the olive and olive oil sector.

6.2.3 Workshop to assess the value of the dashboard

The MED-GOLD project organised an online workshop in June 2021 in order to:

1. Showcase the final version of the dashboard to the Olive sector' users, and;
2. Assess the possible added value of the tool to the sector.

The online workshop was held using Microsoft Teams and 6 members of DCOOP, who mostly have been directly involved in the co-development process, attended the workshop (Table 6-2). Participants were from different DCOOP departments such as Field Technician Department, Olive Oil Logistics, Olive Oil Laboratory and Table Olive Department.

The workshop was planned and structured by the University of Leeds and run by DCOOP, BSC and GMV partners in Spanish. The workshop agenda was divided into two sessions (table 6.2.):



- The first session of workshop was aimed to introduce the final version of the tool. Hence, it started with an introduction of Dashboard using a video of the tool, explaining different use cases on the application of the tool to user-relevant decisions made at various time scales (<https://www.youtube.com/watch?v=2Y5xgdXnPI8>) and the tool's online version.
- The second session was set to assess the tool's added value for decisions in the Olive sector. Hence, during this session the users were asked to provide examples of key decisions in their area of expertise that are influenced by climate conditions throughout the year and how the Dashboard could help them to make their decision. This session was also useful to identify limitations of the tools (or, and further changes need to consider to it more usable for the users.

Table 6.2. Workshop agenda to assess the added value of the dashboard

Dashboard demonstration	
11:00 – 11:10	Welcome and introduction to the MED-GOLD project and workshop
11:10 – 11:15	Dashboard video
11:15 – 11:45	Dashboard demonstration through its online version and Q&A
11:45 – 12:00	Break
Dashboard Assessment	
12:00- 12:20	Assessment on: <ul style="list-style-type: none"> • The Dashboard usability • The tool added value on the Olive sector's decisions • Further changes to make the tool more usable

6.3 Results

6.3.1 Results from the Olivia platform survey

As mentioned in the methodology section, the survey regarding the Olivia platform was sent to DCOOP and EC2CE agronomists in August 2020. However, only 3 agronomists from DCOOP responded to the survey.

Given the limited number of responses, WP2 partners were asked to follow up with DCOOP agronomists and users who were involved in the development process.

EC2CE sent a list with 19 DCOOP agronomists who had registered as users on the Olivia platform in September 2020. However, as only 3 technicians had filled the survey, DCOOP enquired the technicians in the list and asked the reasons why they had not responded to the survey. A number of reasons were provided by all DCOOP registered users as to why they did not use and then respond to the survey which are summarised in figure 6.2.



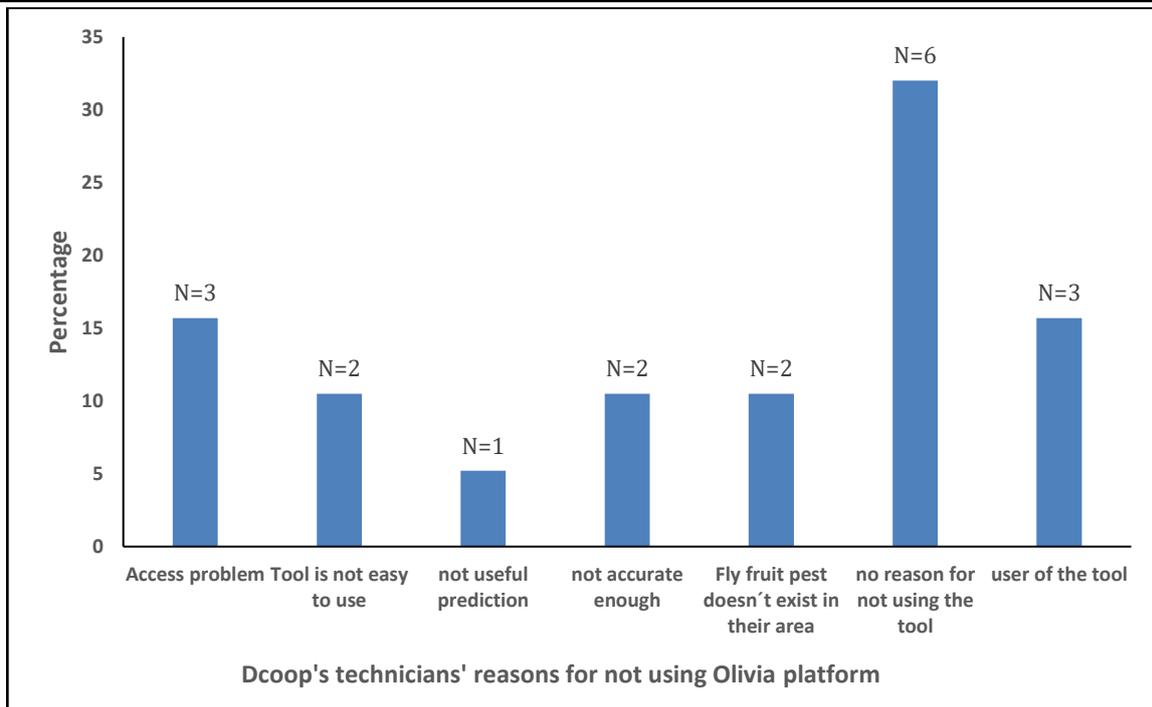


Figure 6.2: DCOOP technicians' reasons for not using Olivia platform

Figure 6.2. above shows the reasons why DCOOP technicians did not responded to the survey which included:

1. Three technicians did intended to test the Olivia platform but could not access it.
2. Two technicians confirmed that this tool did not seem to be useful for all areas of Andalusia because olive fly fruit simply does not exist or it is not harmful in some areas. Therefore, the Olivia platform was not useful for them and instead they used the data from their monitoring control farms.
3. One technician claimed the tool generated the prediction based on the weekly information provided by the technicians of ¹API. Therefore, the tool did not provide new and useful predictions for the olive farms that did not already exist in the API system.
4. Two technicians considered Olivia platform's predictions for 1 week in advance accurate but the tool seemed less useful for the 2, 3, and 4 weeks in advance. The prediction of olive fruit fly pest for 1 week in advance made by Olivia Platform was not very useful for them because their data from monitoring control farms already covered this timescale (1 week in advance).
5. Two technicians who had used the tool in 2019, stated that they did not use it as the tool was not easy to use.

¹ APIs are the Integrated Olive Production Associations in Spain that provide weekly information on the status of the pest and the crop in their member farms.



For the three DCOOP technicians who used the Olivia platform and responded to the online survey the main findings included:

Use of information in decision-making

Only 1 out of 3 survey participants confirmed that they applied the information in their decision-making and they stated that the tool helped them to find the suitable time for pest treatment. However, the 2 other survey participants could not use the Olivia platform due to following reasons:

1. They could not find their farm in the platform,
2. The data provided by the Olivia platform is not reliable enough to use.

Accessibility: Three participants responded to the question and all claimed that the tool is easy to access.

Understandability: Only one out of 3 confirmed that the tool and data was easy to understand. One of them was not sure about the understandability of the tool, and one claimed it is not easy to interpret at all.

Timescale and variables: Three respondents confirmed that the Olivia platform provides information at the right lead time they need for fly fruit pest.

Data reliability: Three technicians responded to this question and 2 of them confirmed that data provided by the Olivia platform is reliable enough to be used in their decision-making. The third technician confirmed that he did not use the platform because even though the prediction for 1 week is accurate, data seems less accurate 2, 3, and 4 weeks in advance.

6.3.2. Additional survey results from the Andalusian government

Due to lack of enough feedback from DCOOP technicians, the MED-GOLD team asked the Andalusian government to disseminate the survey to other potential users of the Olivia platform in the region. Eleven participants responded to this round of dissemination and the results are summarised below:

• **The Olivia platform Usability**

To explore the usability aspects of the tool, participants were questioned about the tool's accessibility, understandability, climate variables and right lead time. Regarding to the tools' accessibility, as Figure 6.3 shows, nine participants responded to this question and six of them agreed or strongly agreed that the tool is easy to access.



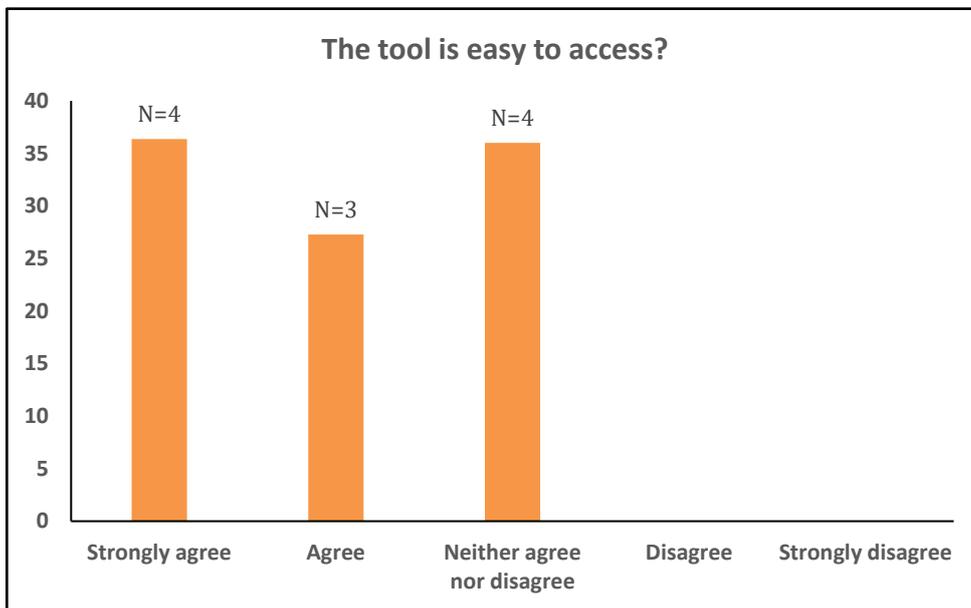


Figure 6.3 Participants responses to the tool accessibility

The Olivia platform map and data format are easy to understand. We also asked them whether the information provided by the tool is easy to interpret or understand. Eleven participants answered to the question and only 5 of them agreed or strongly agreed that the tool is easy to understand (Figure 6.4).

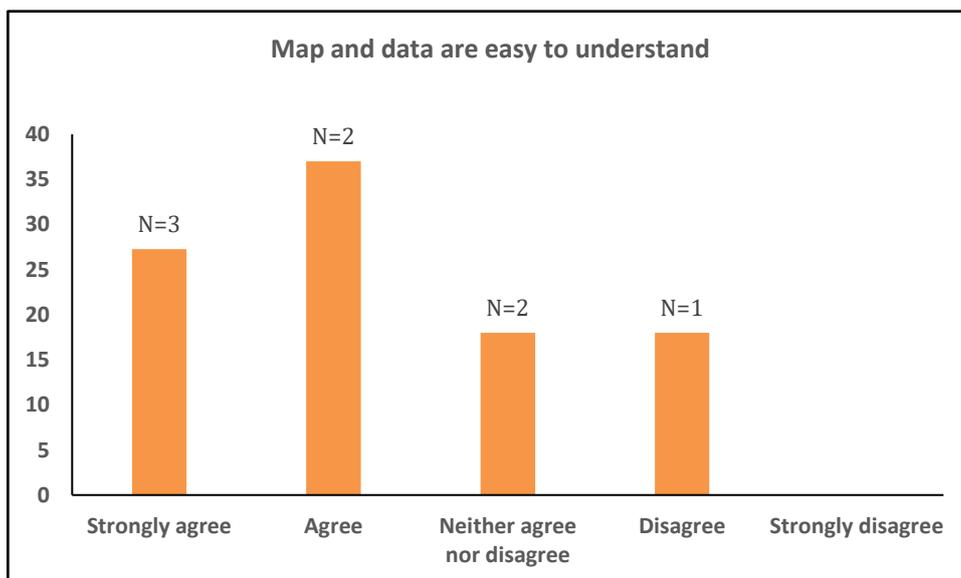


Figure 6.4 Participants responses to the tool's understandability



We asked participants whether the Olivia platform provides the information at the right time to inform their activities and decisions (e.g. 7 days in advance for pest treatment, one month in advance for members). Seven out of ten agreed that the tool provides the right lead time that they need in their role (Figure 6.5).

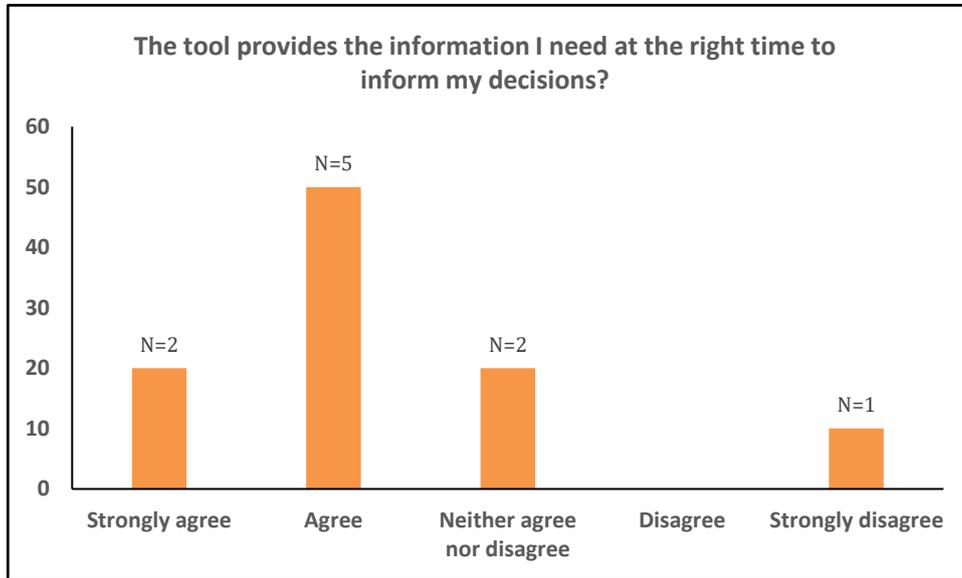


Figure 6.5 Participants responses to the tool' providing the information at the right lead time

They were questioned whether the tool provides the weather and climate variables that they need to make decisions in the Olive sector. Ten participants responded to this question and six out of ten agreed that the tool provides the variables that they need to make decisions in their roles (Figure 6.6).

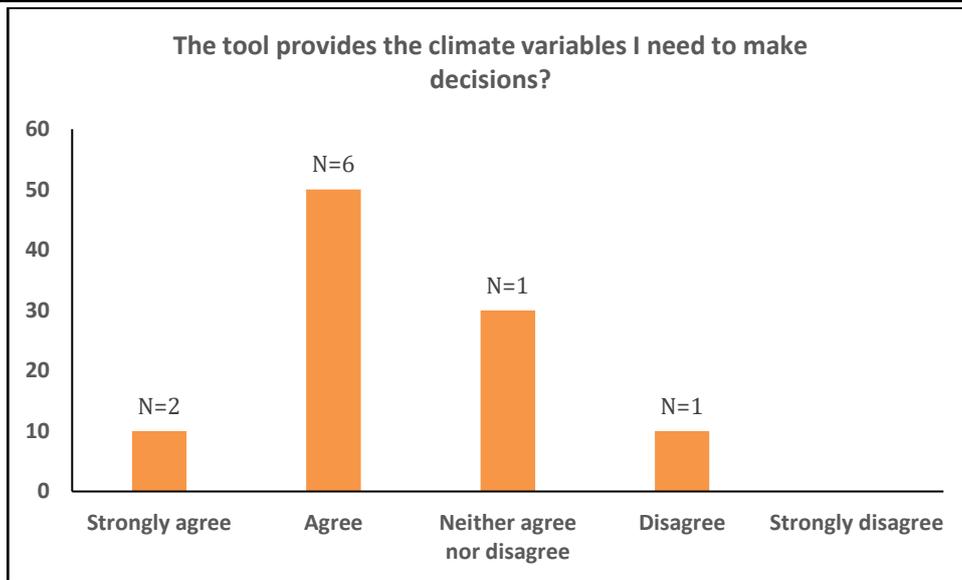


Figure 6.6 Participants responses to the tool' climate variables

More importantly, we asked them about the reliability (i.e. the information is trustworthy) of the information provided by the Oliva platform. Ten users answered this question and only three of them were pretty sure that data seems reliable (Figure 6.7).

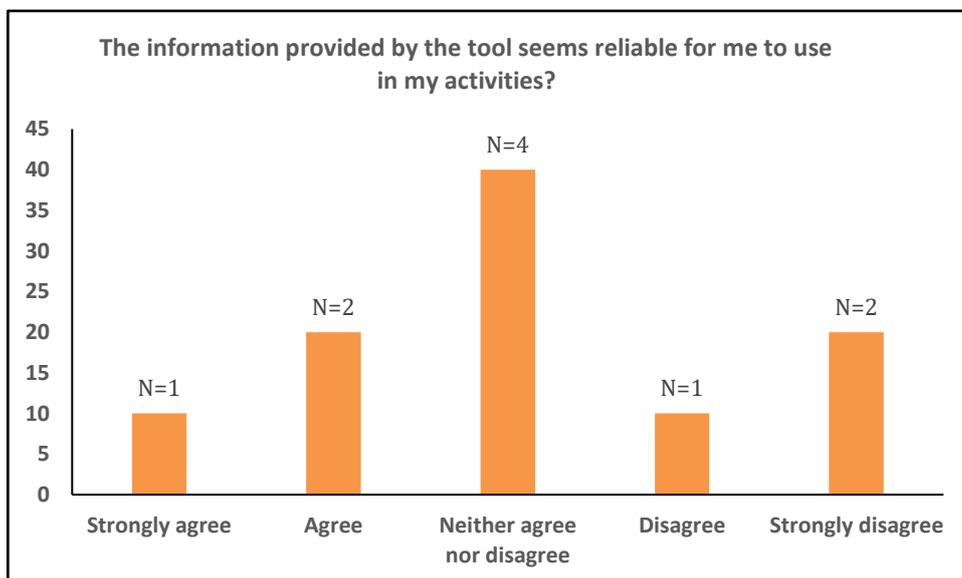


Figure 6.7 Participants responses to the tool's data reliability

- The use of Oliva platform in decision-making**



Participants were then asked if they could use the Olivia platform to support their activities and decisions in the next weeks. Ten participants responded to this question and only 3 of them used the tool.

The users were further questioned about the reasons for not using the information provided by the Olivia platform in their decisions. Seven users responded to this question and their reasons are (figure 6.8):

- a) Olivia platform provides temperature (min, max, mean) and precipitation, but I need more variables such as humidity in my activities.
- b) The data on the Olivia platform is not reliable enough to use (Data reliability has been of the main barriers of using the tool in their activities).

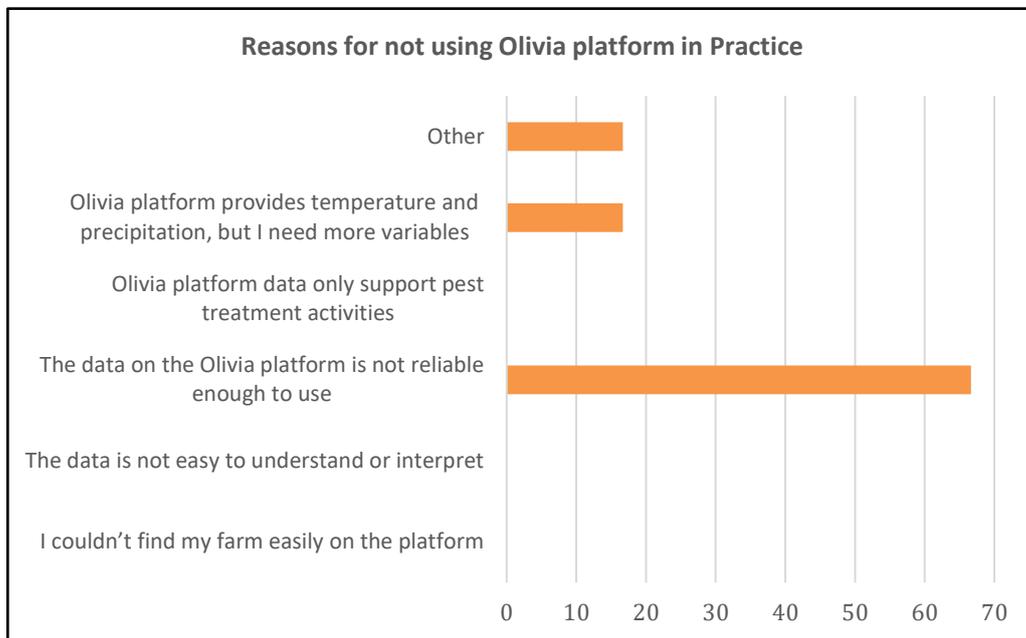


Figure 6.8 Participants reasons for not using the Dashboard in their decision-making

They were asked whether the tool could be easily understood and used by other users such as farmers in the region. Only 4 participants answered the question:

- *Yes, if they don't ignore the recommendations of the API technicians,*
- *No, data only can be interpreted by a technician,*
- *The farmers in my region are not familiar with these types of technologies,*
- *Yes*
- **Recommendations to improve the tool usability**



Then in order to enhance the usability of the tool, the users were asked what changes they would make to the tool. Only one participant responded to this question and suggested:

“ I need to have access to all the parcels of my municipal area, not only those that appear in my database”.

We have also asked them whether they would pay to use the tool, and 10 users answered to this question and they all will not pay for the tool. One participant has also given the following comment on the Olivia tool:

“ I do not properly understand that the purpose of government/administration was to make money or make other enterprises earn money at the expense of those technicians who are carrying out the pest control labours and generate data without any help/grant from the Government, taking into account that our work produces all the information in which this application relies on”.

6.3.4 Results of the workshop to assess the value of the Dashboard

As explained in the methodology section, an online workshop was held to assess the usability of the latest version of the Dashboard in June 2021. The tool was demonstrated to the workshop participants and then second session started to discuss the following themes (Table 6.3):

Table 6.3. Themes and sub themes discussed in the workshop

Theme	Sub-theme
The Dashboard usability	<ol style="list-style-type: none"> 1. Access to Dashboard 2. Maps and the available data are easy to understand. 3. The dashboard provides the time scales (Historical climate, Season forecast and long-term climate change projections) I need in my decision-making. 4. The dashboard provides the variables I need in my activities: 5. In general, the information I find in the Dashboard seems reliable and useful in making decisions. 6. I would use the Dashboard in the future
The Dashboard' added Values on the Olive sector's decisions	<ol style="list-style-type: none"> 7. Type of decisions that they believe the Dashboard could assist with, 8. about the potential benefits of using the dashboard in their activities
Further changes to make the Dashboard more usable	<ol style="list-style-type: none"> 9. Further improvements in order to increase the potential usability of the dashboard

To create a meaningful engagement the following questions were designed by Mentimeter Software so that the participants could score the questions, provide comments and aid discussion and further comments by the participants .



6.3.4.1 The Dashboard usability

A number of statements were shown to participants and they were asked to vote on a scale of 0 to 10 each of the statements presented (with 0 not agreeing at all and 10 being in total agreement with the statement). The result has been summarised in table 6.4.

Table 6.4 Number of voted received on the dashboard usability sub-themes

Sub theme	Score (out of 10)	Users comment
Access to Dashboard seems easy.	8.6	
Maps and the available data are easy to understand.	7.2	Two participants scored it 6 due to the language barrier as the tool was designed in English and it limited the access to olive sector by Spanish farmers. They also commented that the current version of the dashboard is only usable for technical users and it is too technical for farmers and non-technical users.
The dashboard provides the time scales I need in my decision-making.	8.8	
The dashboard provides the variables I need in my activities:	7.8	The variables seem useful but the way of visualizing them is not clear enough.
In general, the information I find in the Dashboard seems reliable and useful in making decisions.	7.6	This point depends on the type of users. Dashboard should have several profiles of users and in each of them the visualization will have more or less technical level.
I would use the Dashboard in the future	7.6	To use the Dashboard in the future, the dashboard should be an operational tool with updated climate data automatically every month/year according to the type of information (historical, seasonal or long-term climate change projections).

6.3.4.2 Added value of the MED-GOLD Dashboard

Participants were then asked about the type of decisions that they believe the Dashboard could assist them with in their activities and decisions. Received votes and discussion showed that the tool can be helpful for decisions such as pest control, harvest planning and production prediction (Table 6.5)

Table 6.5 Number of voted received on the usability of the dashboard for various decisions

Decision	Score	Users comment
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Pest control	4	Here, it was discussed that information at the sub-seasonal scale (next 2-3 weeks) was useful only for the olive fly, but that information for the next weeks and months is useful for other pests.
Pruning	1	-
Fertilization	2	-
Irrigation	2	-
Harvesting planning	4	-
Production forecast	4	-
Other decisions	1	One participant suggested the tool could be helpful for soil management.

Another point that the participants here highlighted was the format in which data could be exported. Although, CSV allows the users to handle the information, this requires to have some basic knowledge of Excel to be able to open it (which is not usual in the agriculture sector). Whereas the participants appreciate the data can be downloaded in CSV and see it as a positive change towards the agriculture sector, the current CSV format doesn't seem easy to use for this type of user. They suggest that data could be downloaded in Excel where different variables and their value can be organised by columns to make it easier for the agricultural users to understand.

- 1) Do you think that the climate information provided by the dashboard can be beneficial for your activities and decision-making?

Users commented that benefit of the dashboard in decision-making will depend for example on the type of users and type of decisions:

- Seasonal forecast: for predicting the olive oil production for next season (WINRR)
- Long term prediction: for modernization of olive farms, change the system of crop (super intensive, intensive, traditional), turn olive farms into other crops.

- 2) Benefits of using the Dashboard in the olives and olive oil sector

Participants were asked to think about the potential benefits of using the dashboard in their activities and score the following items in Table 6.6.

Table 6. 6 Benefits of using the dashboard in the Olive sector

Decision	Score	Users comment
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Optimization of the fertilization for the season	1	
Improve pests control	1	For this benefit, participants emphasised that as long as the Dashboard's seasonal forecast is reliable, its information can be useful for decisions related to pest control, however it should be assessed in real conditions. -
Assisting commercial distributors with the planning on volume of product and treatments for the next season	0	
Other decisions	1	The precipitation information could be used to predict the volume of olive oil for the next season which is a key information in the olive sector.

6.3.4.3 What changes do you suggest in order to increase the potential usability of the dashboard?

Participants suggested further improvements in order to increase the potential usability of the dashboard:

- Simplifying the dashboard as this version was considered too technical for farmers;
- When checking the olive sector information, the dashboard should centre the map on the centre of Andalusia;
- Providing Spanish version of the Dashboard otherwise, it won't be used by Spanish farmers;
- Turning the name of climatic variables and bioclimatic indicators into their definition. For example, change the WINRR to precipitation from October to May;
- Regarding seasonal forecast, adding the numeric data could help understand the baseline of the forecasts. Participants suggested that changing the values that appear in the ordinate axis (currently from 0 to 33%, from 33 to 66% and 66 to 100%) into a numeric value and its units (e.g. °C for temperature, and mm for precipitation). Furthermore, adding the value of the mean of the parameter would allow users to understand which is "normal", "above normal", and "below normal". Users don't necessarily know what is the normal temperature from April to May over all olive areas in Andalusia or where DCOOP has olive farms.

Regarding the future use of the tool, participants said they would not be potential users of this tool due to three main reasons:

- a) After the end of the project the Dashboard will not be updated;
- b) The tool should be simpler to understand and use;
- c) Users need a high level of knowledge to use the current version of the Dashboard.





6.4. Conclusions

Regarding the Olivia platform value assessment, it seems the tool is not salient enough to use by the users. Some technicians could not access the Olivia platform, and some said it was not easy to use, and others explained that the tool has only been designed for one pest (Olive fly fruit) which is not harmful in all areas. They also mentioned that the tool does not generate any new data and the data was taken from APIs. In terms of the timescale, it was pointed that the tool' forecasts of olive fruit fly pest for 1 week in advance made by Olivia Platform is not very useful for users as their own data from monitoring control farms covers this timescale (1 week in advance).

Regarding the dashboard added value assessment, participants acknowledged the great progress of the tool comparing to the previous version. Regarding the data saliency, they all agreed the dashboard provides the timescales and variables they need in their decision-making. They also discussed that the tool could help them with some critical decisions such as pest control, harvest planning and estimation of production. In terms of data reliability, they all believed the data are reliable enough to use it in their role. However, they were of the opinion that this version of the Dashboard will be only useful for a minority of users in the olive sector as it is not intuitive enough for some users like farmers due to language barrier as the tool has been designed in English language. Hence, they suggested the Spanish version of the tool could be more usable for Spanish users. They also suggested simplifying the tool can increase the usability of the tool e.g., making some changes such as the name of climatic variables and bioclimatic indicators into their definition(e.g. change the WINRR to precipitation from October to May). They acknowledged that the current version of the Dashboard won't be useful if the data is not updated automatically after the project. Therefore, according to the assessment results and users' feedback some simple changes on the dashboard could improve its usability among Olive sector' users.



ANNEX 1: ONLINE SURVEY QUESTIONS

A. Olivia Platform' accessibility

1. I could access the Olivia platform easily.

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?

2. The navigation through the Olivia platform was easy and fast.

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?

3. I could easily identify my farm(s) in the Olivia platform.

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?

4. The Olivia platform map and data format are easy to understand.

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?



5. The explanatory text provided by the Olivia platform was helpful to understand how to use the platform and interpret the results.
- Strongly agree
 - Agree
 - Neither agree nor disagree
 - Disagree
 - Strongly disagree

Any additional comment?

B. Climate information provided by the Oliva platform

6. The Olivia platform provides the information I need at the right time to inform different activities and decisions (e.g. 7 days in advance for pest treatment, one month in advance for fertilizing).
- Strongly agree
 - Agree
 - Neither agree nor disagree
 - Disagree
 - Strongly disagree

Any additional comment?

7. The Olivia platform provides information at the right lead time regarding the evolution of olive fly (e.g. one week ahead of time, 2 weeks ahead of time, etc)
- Strongly agree
 - Agree
 - Neither agree nor disagree
 - Disagree
 - Strongly disagree

Any additional comment?

8. The information on Olivia platform provides useful past weather data (e.g. temperature, anomalies for precipitation) to inform my activities and decisions.
- Strongly agree
 - Agree
 - Neither agree nor disagree
 - Disagree





e) Strongly disagree

Any additional comment?

9. Would it be useful to also have information on weather forecasts (e.g. prediction of temperature and precipitation for the next month, 3 months, 6 months)?

- Yes
- No

10. Overall, the information provided by Olivia platform is reliable (i.e. the information is trustworthy) for me to use it in my decisions.

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?

C. Using the climate information to support the decisions in the Olive sector

11. Have you used the information provided by the OLIVIA platform to inform/support your activities and decisions in the last weeks?

- Yes
- No

If yes, could you answer the following questions 13-16

If no, go to Q16

12. Did you use the information provided regarding the prediction of pest evolution? If so, could you please describe how you used this information in your activities?

13. Have you used additional information (i.e. besides the pest recommendations) provided by the Olivia platform in your activities? If so, please describe the activities and how you used it.

14. Overall, how useful was the information provided by the Olivia platform?

15. Have you been involved in the development of the OLIVIA platform?

- Yes



- No

If the answer was "yes", how were you involved?

16. Could you please describe why haven't you used the information provided by the Olivia platform? (You can choose more than one option)

- c) I couldn't find my farm easily on the platform
- d) The data is not easy to understand or interpret
- e) The data on the Olivia platform is not reliable enough to use
- f) Olivia platform data only support pest treatment activities
- g) Olivia platform provides past weather data, but I also need weather forecasts (e.g. prediction of temperature and precipitation)
- h) Olivia platform provides temperature (min, max, mean) and precipitation, but I need more variables such as humidity in my activities.

Any additional comment?

D. Using the tool in the future

17. I would use the Olivia platform in the future.

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?

18. In your opinion, do you think the Olivia Platform will be easily understood and used by others (e.g. farmers in your region)?

- Yes
- No

If the answer was "No", why?

19. I would recommend the OLIVIA platform to others (e.g. technicians, farmers) as it helps inform/support my activities and decision-making (e.g. pest treatment and fertilization).

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree





- d) Disagree
- e) Strongly disagree

Any additional comment?

20. What would you change to make the OLIVIA platform more usable to you?

21. Would you pay to use the Olivia platform?

- a) Strongly agree
- b) Agree
- c) Neither agree nor disagree
- d) Disagree
- e) Strongly disagree

Any additional comment?

22. Overall, how would you rate the Olivia platform?

- a) Excellent
- b) Above average
- c) Average
- d) Below average
- e) Poor

23. Any other comments?





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