



EU H2020
PROJECT
GA 862848

*Linking East and West African
farming systems experience into
a BELT of sustainable intensification*



EWA-BELT

*Linking East and West African farming systems
experience into a BELT of Sustainable Intensification*

***APPENDIX TO THE HANDBOOK –
PLANTHEAD MOBILE APP FOR SMARTPHONES
Version 1.0***



www.ewabelt.eu



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AUTHOR

Giovanni Zanoni*.

AUTHORS AFFILIATION

*OCCAM, Osservatorio sulla Comunicazione Culturale e Audiovisiva nel Mediterraneo e nel Mondo

CORRESPONDENCE

* Via Duccio da Boninsegni, 21, 20145, Milan, Italy. occam@occam.org





INTRODUCTION

This file has been conceived with the aim of creating an accessible guide for all users of the PlantHead mobile app for smartphones, which is an integral part of the PlantHead Platform of the EWA-BELT Project. PLANT HEALth Diagnostic (PLANTHEAD) aims to promote real-time diagnosis and environment-friendly crop protection approaches in resource-constrained environments lacking the organizational and/or the sociotechnical system resources to cope with food insecurity issues. The PLANTHEAD network will be based on the Internet of Things (IoT), wearable technologies, and mobile devices. The shared database will represent an extremely valuable tool for epidemiological studies as it generates interactive georeferenced maps, hence allowing real-time monitoring, modeling, and forecasting for the progression of a pathogen or any pest that may raise serious food security/ safety concerns.

This file contains an explanation of the PlantHead Mobile app functionalities, both for Online and Offline mode. In the detailed descriptive part of the functions, one photo will correspond to one number in brackets (i.e. [1], [2]) to provide visual support during reading and to be able to compare with what is displayed inside the platform.

For any other information concerning the PlantHead Platform functionalities, kindly refer to the document “*HANDBOOK PLANTHEAD PLATFORM Version 2.0*” available on the EWA-BELT website at the following link: [Handbook V 2.0](#).





1. PREMISES

The PlantHead mobile app for smartphones is specifically designed for field use by **Users** with the **Farmer** role or by Users in other roles who have enabled the ticket submission option.

The PlantHead mobile app for smartphones is built to support certain offline functionalities.

The PlantHead app for smartphones is available for both Android and iOS. Find below the QR codes to be scanned in order to download the desired version or visit the page <https://www.ewabelt.eu/plathead-platform>.



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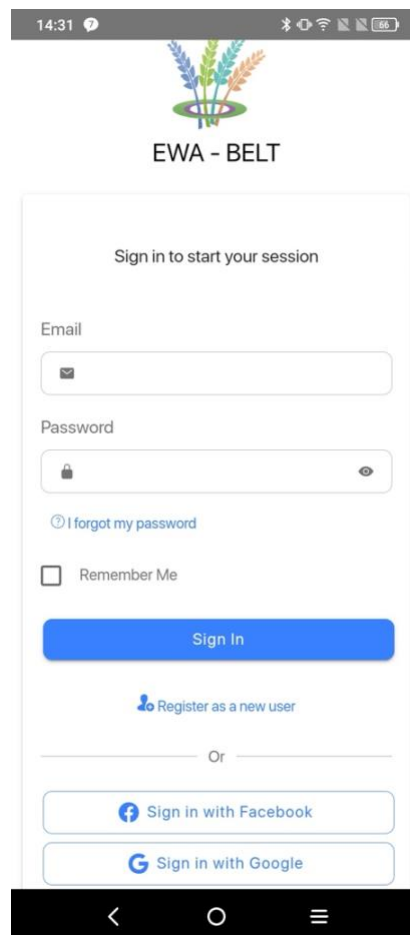




2. APP FUNCTIONALITIES

2.1 Online functionalities

1. The **login** area [1] allows Users to access the App either through an existing account or by registering a new one. New users must click on the option “*Register as a new user.*” Those who are already registered on the PlantHead Platform can just insert their credentials and click on **Sign in**.
In case the User has a Google email address (@gmail), he needs to log in by clicking on “*Sign in with Google*”
In case the User has a Facebook account, he can log in by clicking on “*Sign in with Facebook*”.
For the iOS version of the App, Users can log in by using their Apple ID.



1 - The login area of the App





2. **New User Registration:** when a new user clicks on *Register as a new user*, he must fill in the registration form with the requested information [2].

In case the User has a Google account (a @gmail email address), he can click on “*Register with Google:*” the registration form will be automatically filled in with some information, and the password will be the same as the Google account.

In case the User has a Facebook account, he can click on “*Register with Facebook:*” the registration form will be automatically filled in with some information, and the password will be the same as the Facebook account.

For the iOS version of the App, Users can register by using their Apple ID.

2 - The registration area of the App (1)

Important:

- **Role:** To select one of the roles [3], new users can choose from the menu displaying the icons of such roles, specifically: farmer, scholar, extensionist, and others. When *Other* is selected, the new user is asked to specify his role.





IMPORTANT: Although the functionalities of the PlantHead App can only be used by Users with the “FARMER” role, Users with a different role can use the App to register for the PlantHead Platform Network and can use the functionalities of the web platform.

In case a User does not have the possibility to send a ticket, kindly contact the support at occam@occam.org, cc giovanni.zanoni@occam.org.

- **Partner**

In this section, new users need to specify which institution of the EWA-BELT Project are associated with, from the drop-down menu [3].

- New users will have all the current partners as selectable options,
- or they can select “Other” instead, specifying the name of the partner in the free-text-compilation voice “Institution name” that will appear.

3. To **complete** the registration process [3], new users must share the location so that the system can assign the respective node for each user; afterward, new users will have to tick the checkbox “I have read and accept the Privacy Policy Statement” and lastly click the “Register” button.

14:32

Password

Select your role

Farmer Scholar

Partner

Select a partner

To use the platform's features, it is necessary to share your location. The location will be used exclusively for research purposes.

Share my location

I have read and accepted the Privacy Policy Statement

Register

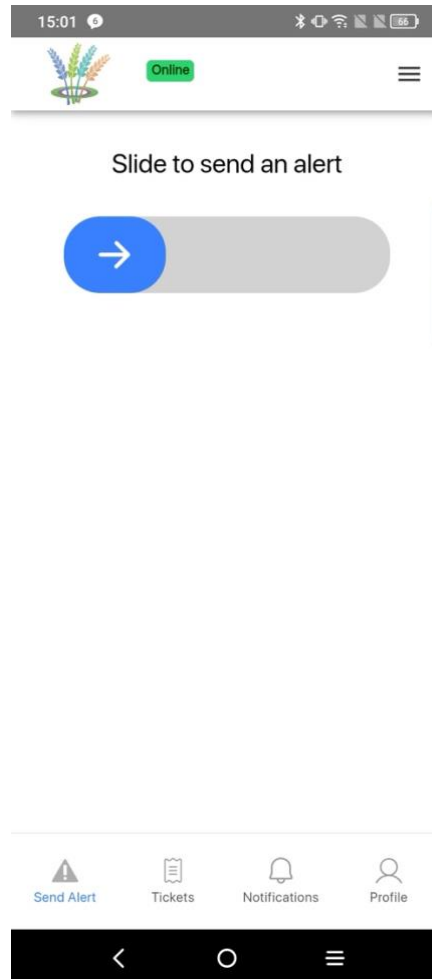
[I am already registered](#)

3 - The registration page of the App (2)





4. Once logged in, the homepage of the app [4] will display a top menu with the connection indicator on the top left and a collapsed menu in the top-right corner. At the bottom, a **menu** allows Users to navigate the various sections of the App: *Send Alert*, *Tickets*, *Notifications*, and *Profile*.



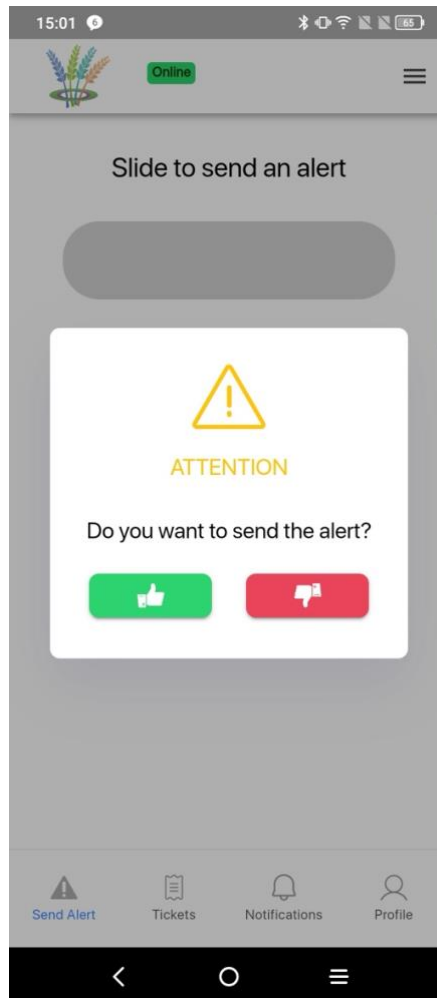
4 - The homepage of the App

5. The connection indicator at the top displays the real-time status of the Internet connection:
- The green label “*Online*” indicates that the connection is active and the app is connected to the Internet.
 - The red label “*Offline*” indicates that the connection is not active and the app is not connected to the Internet. For the offline functionalities, please visit point 2.2, “Offline functionalities”
6. The default page displayed is the **Send Alert** section, through which Users can send an Alert Ticket. Specifically, a blue arrow will appear, and the Farmer will be able to send a ticket by sliding the blue arrow to the right.





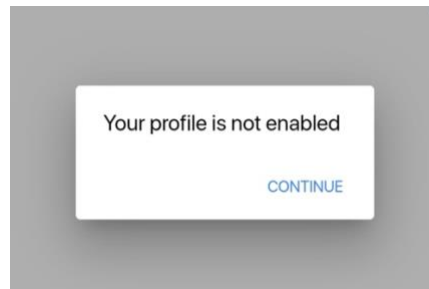
By sliding the blue arrow to the right, the alert will be sent. After submitting the alert, a pop-up [5] will ask you to confirm the request.



5 - The pop-up to send the Alert

IMPORTANT: If Users have selected the role “scholar, extensionist, or others” when trying to send a ticket, the pop-up “Your profile is not enabled” will appear. [6].



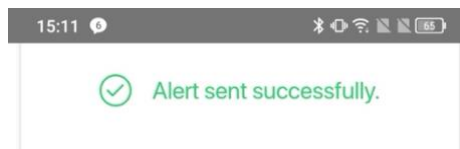


6 - The banner "Your profile is not enabled"

7. Once the alert is confirmed, the **update page of the Alert** will be shown [8]. At the top, the banner “Alert sent successfully” will appear [7]. In this section, Users can integrate the Ticket with further information:

- Take a picture of the affected crop: when taking a picture, a watermark of a leaf will appear in order to help the user to better frame the leaf: Users can select different types of leaf watermarks, or deselect it.
- Register a voice note explaining the issue, if necessary.
- Insert the Name of the Crop.
- Insert the Problem that is affecting the Crop, if known.
- Insert a brief description to provide more details.
- Share location coordinates.
- Fill in the “Diagnostic Form” with further technical details, if known.

Once finished, Users can submit the ticket with the updated information by clicking on the “Send Alert” button.



7 - Ticket successfully sent



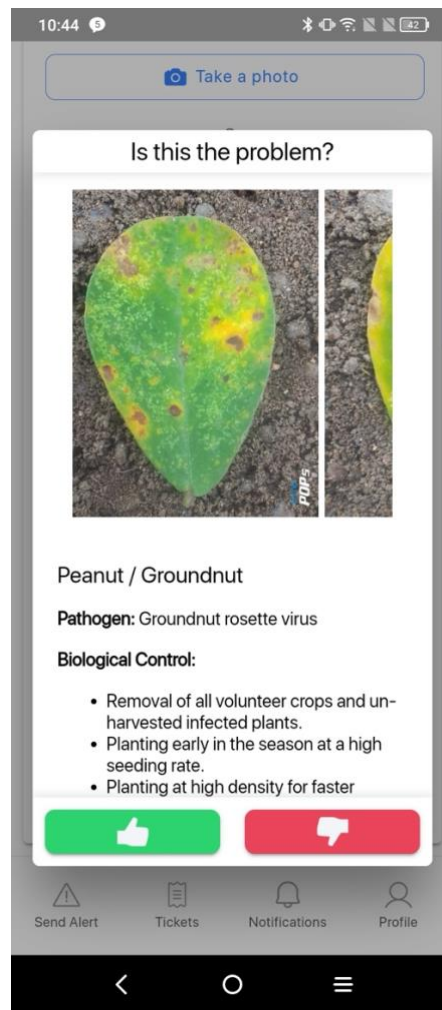


The screenshot shows a mobile application interface for updating an alert. At the top, the status bar displays the time 13:59 and various system icons. The main content area includes a 'Take a photo' button with a camera icon, followed by an 'Or' separator and a 'Record audio' button with a microphone icon. Below these are input fields for 'Crop' (containing 'peanut') and 'Problem' (containing 'yellow leaf'). A 'Description' field is present but empty. A toggle switch for 'Share coordinates' is turned on. At the bottom of the form area are two buttons: 'Fill in the form' and a large blue 'Send Alert' button. A navigation bar at the very bottom contains icons for 'Send Alert', 'Tickets', 'Notifications', and 'Profile'.

8 - The page to update the Alert

8. In case the Crop and Problem inserted by Users is already stored in the platform database when clicking on “Send Alert” a pop-up “Is this the problem?” will appear [9], displaying a series of leaf photos associated with a crop disease.

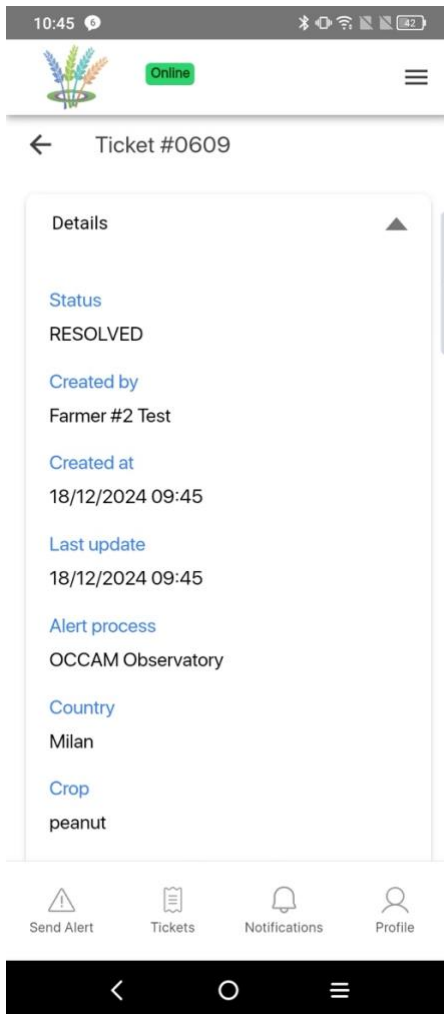




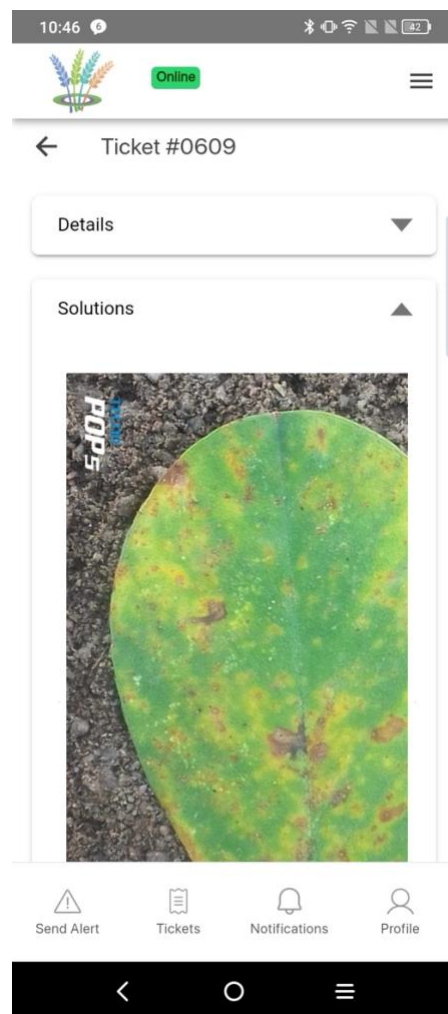
9 - The pop-up "Is this the problem?"

9. If Users recognize the problem affecting their crop, they can click on the green button to select the suggestion, and the ticket will be marked as solved. A new page will open [10], displaying the ticket solved and the possibility of checking the solution assigned to the request. The solution contains the suggested control measures to be adopted in order to treat the affected Crop (please read points 14 – 16 for further information) [11].





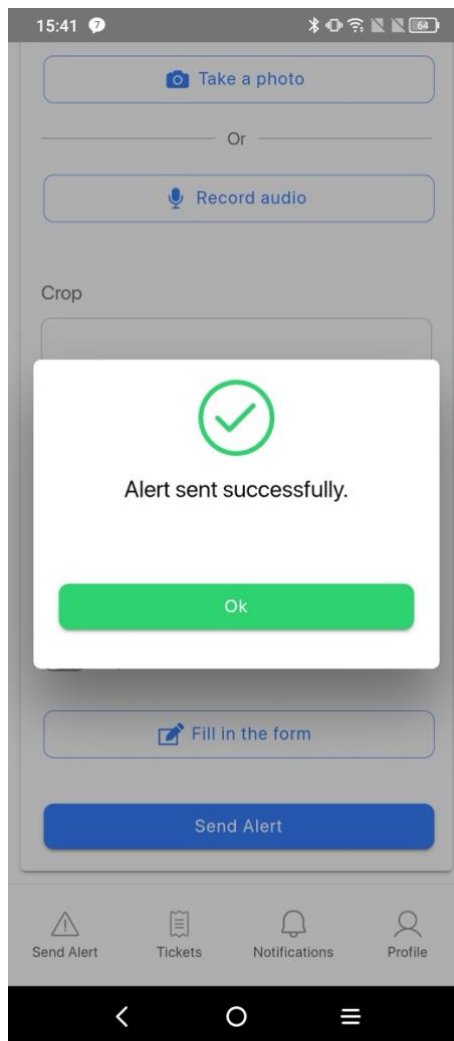
10 - The ticket solved



11 - The solution associated with the ticket solved

10. In case the Crop and the Problem inserted by the User are not stored in the platform database yet, or in case the User does not recognize his problem, the ticket will be sent and marked as in progress, and the local node will take care of it [12].

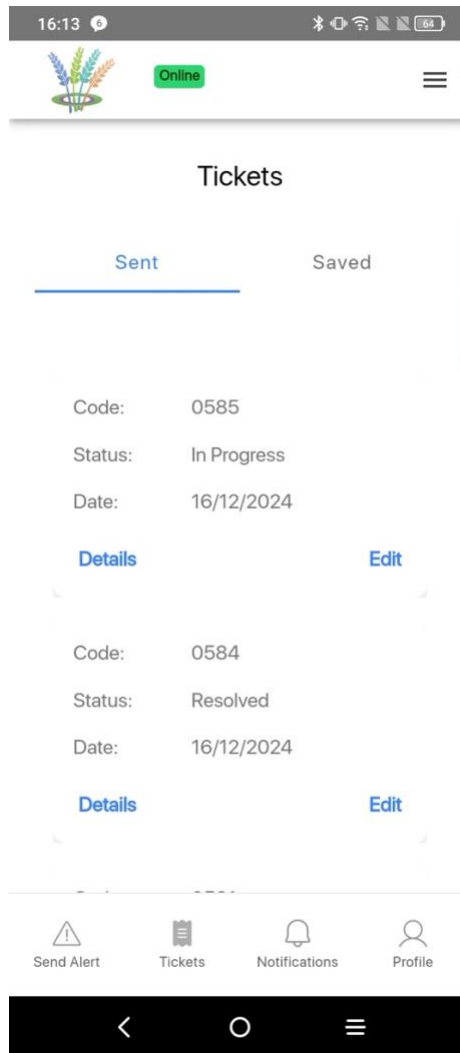




12 - Ticket successfully sent

11. By clicking on the **Tickets** button on the menu, the page will show two sections, “*Sent*” and “*Saved*” [13]:
- The first section (**SENT**) will display the cards of the tickets created and sent by the User, both IN PROGRESS and SOLVED. Specifically, the information on Code, Status, and Date will be shown.
 - The second section (**SAVED**) will show the cards of tickets created by the User while in offline mode: please note that as soon as the app is back online, the tickets contained in the SAVED section will be automatically sent, and they will be displayed in the SENT section. (For the offline functionalities, please visit Section 2.2 “Offline functionalities”)





13 - The ticket page of the app

12. For tickets in the SENT section, by clicking on the left button “*Details*,” Users can open the ticket card [14] and view all the details related to the ticket (Code, Status, User code/Name, date of creation, and date of update, Node where it has been assigned, Country, Crop, Problem, Description). By clicking on the Location button, Users can view the GPS location from where the alert has been sent.

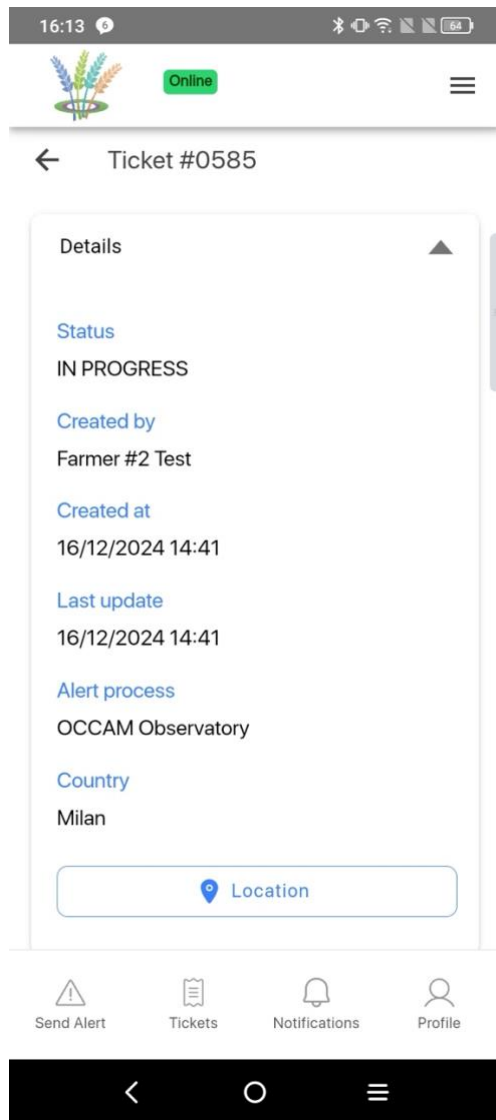
By scrolling down, more sections can be viewed [15]:

- a. The **Attachment** section shows the photos taken by the User (please note in case no photos have been taken, the section will not appear);
- b. The **Audios** section contains the audio recorded by the User (please note in case no audio has been recorded, the section will not appear);
- c. The **Form** section contains the data inserted by the User in the Diagnostic Form (please note in case no data have been inserted in the form, the section will not appear);

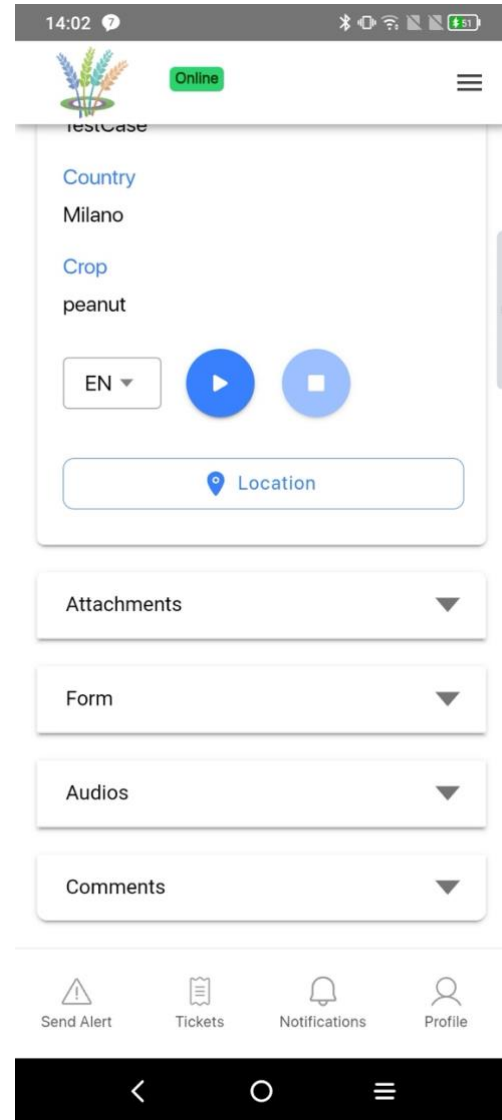




- d. Finally, the **Comments** section displays the comment added to the ticket. From this section, the User can add a comment and/or reply to one.



14 – The Details section of the ticket



15 - The other sections of the ticket

13. By clicking on the right button “*Edit*,” Users can edit the ticket details. After editing, the User must click on “Update Ticket” to save the changes made.
14. When the ticket status shifts from “In progress” to “Resolved,” the User will receive a notification on the app [16]. The **solution** assigned to the ticket is displayed under the section “**Solutions**,” and Users can view the solution card by clicking on the section [17]: a series of photos showing the crop’s leaves





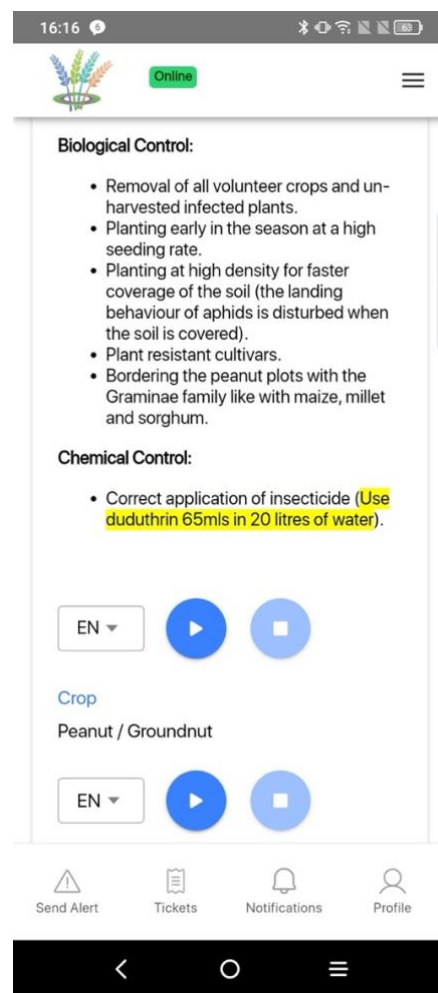
affected by the disease will be displayed, together with the related Suggested control measures, which can be Agronomic, Biological, and Chemical [18].



16 - The notification received when the ticket is solved



17 - The solution section of the ticket (1)

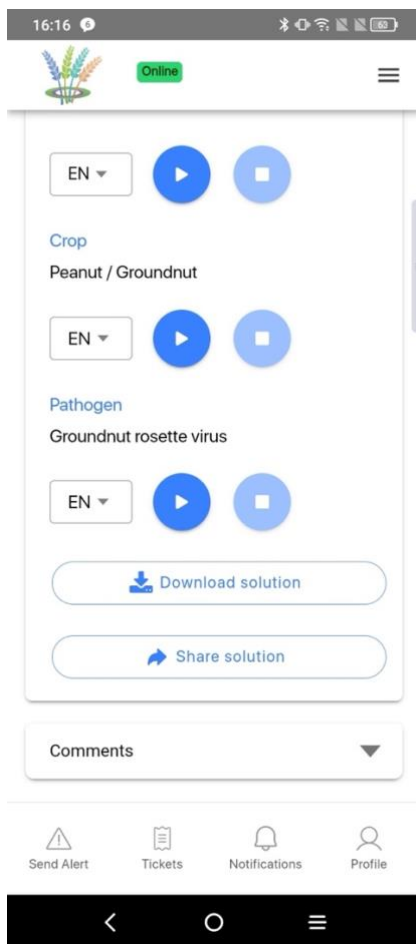


18 - The solution section of the ticket (2)

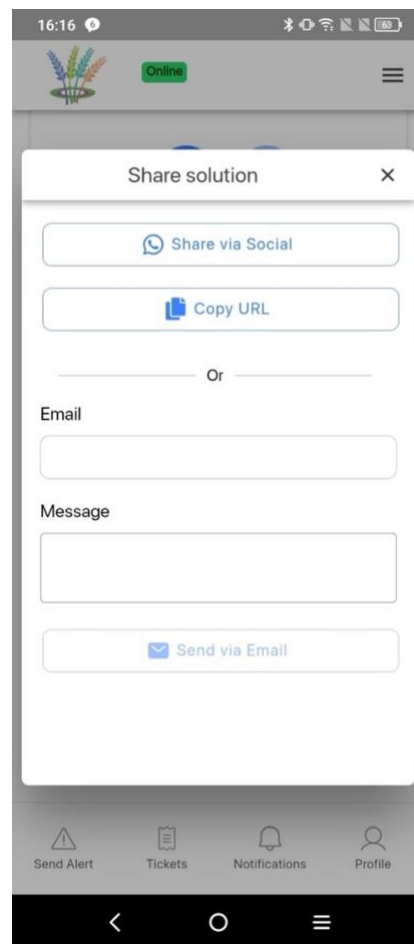




15. Users will be able to listen to the text of the solution by clicking on the Play button. The text can be played in three languages: English, Italian, and French.
16. Furthermore, Users can Download the solution table in .pdf as well as share it [19, 20]:
 - a. Via Social (using the social options available on his smartphone);
 - b. By copying the public URL of the solution;
 - c. Via email thanks to the dedicated box and clicking on “Share via Email”



19 - The solution section (3)



20 - The pop-up to share the solution



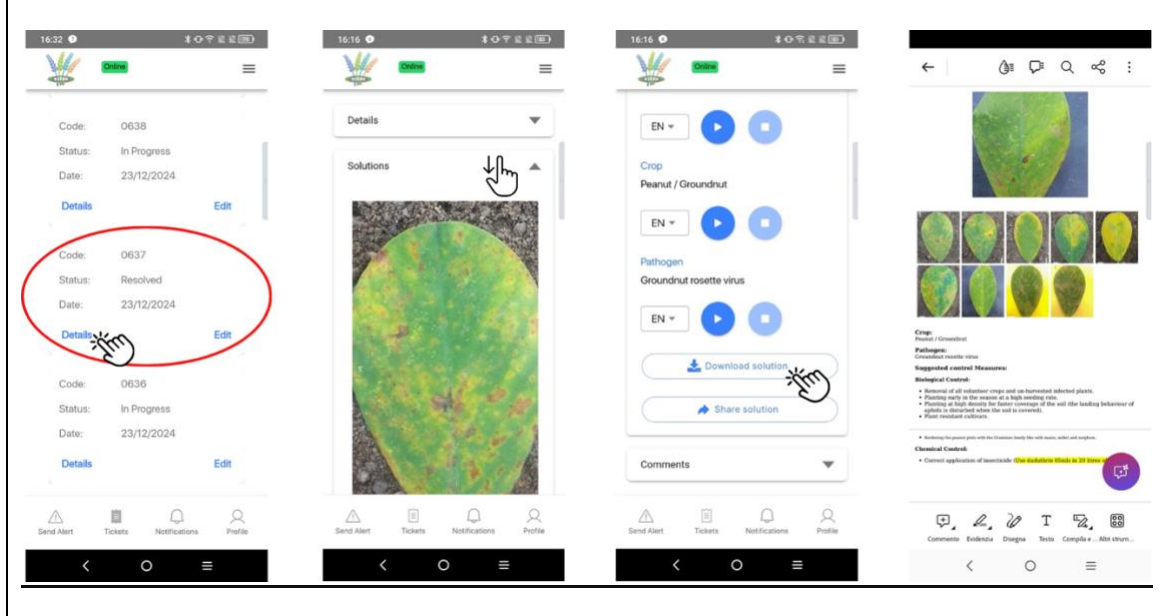


IMPORTANT: To ensure the solution is accessible when the app is offline, Users must download the PDF version of the solution to their smartphone by executing the steps below:

1. Open the solved ticket.
2. Navigate to the Solution section.
3. Click on “Download the solution”

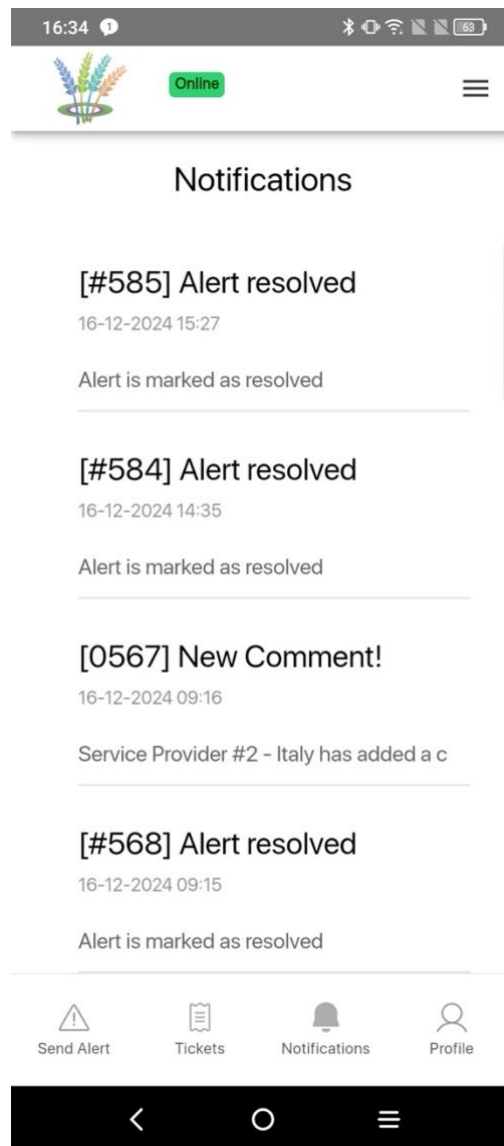
Depending on Users’ smartphones, the process of saving the solution file on the local download storage might be different: Users may need to confirm the location where to save the solution and/or give permissions to complete the download.

When the User will be offline, the solution will be accessible on the local storage of the smartphone.



17. The **Notifications** section [21] warns Users of every update concerning their Alert tickets. Therefore, the User will receive a push notification on his smartphone every time an action has been taken on their Alert Tickets (ticket resolved, response to a comment, etc.)
18. When the User receives a push notification, they can open it to access the app. Once the app opens, the User can click on the **Notifications** button and select the corresponding notification to view the related ticket.

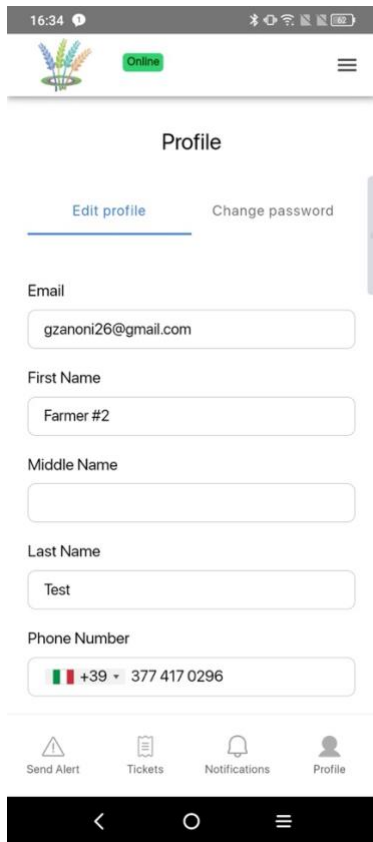




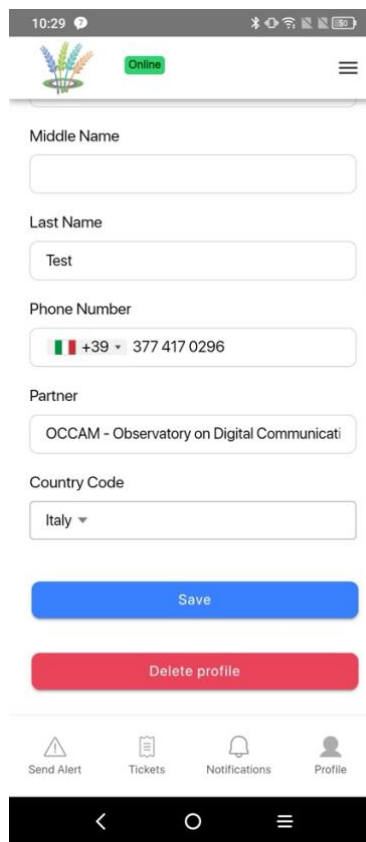
21 - The notification section

19. The **Profile** button [22, 23, 24] displays all Users' information and allows them to edit the password, add the phone number, and edit other personal information. Furthermore, the User will be able to delete his account by clicking on the red button "Delete profile".

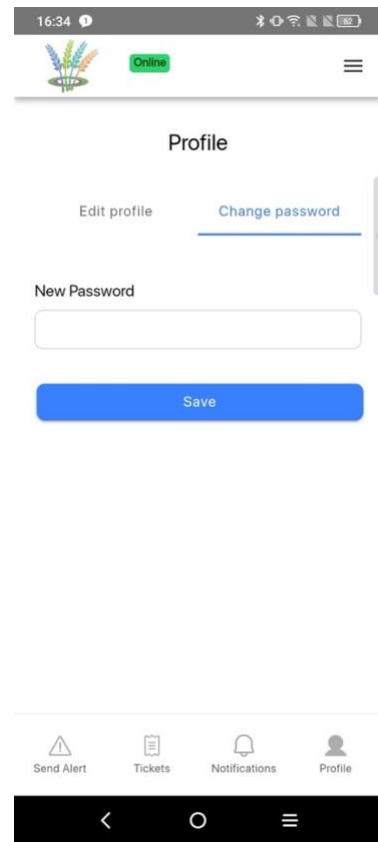




22 - The profile section (1)



23 - The profile section (2)

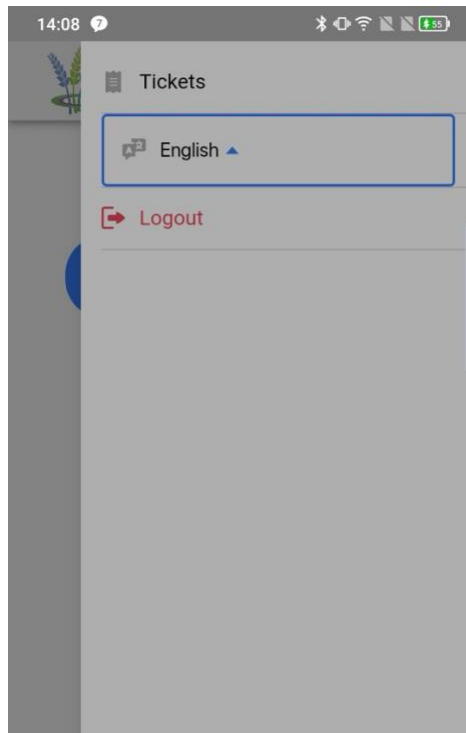


24 - The profile section (3)

20. By clicking on the top right menu, a column with the following actions will open [25]:

- a. The **Tickets** button, which allows Users to open the tickets page;
- b. The **Translation** button allows Users to instantly translate the app into three different languages: English, French, and Italian;
- c. The **“Logout”** button to quit the app.





English

Italiano

Français

Cancel



25 - The translation menu of the app



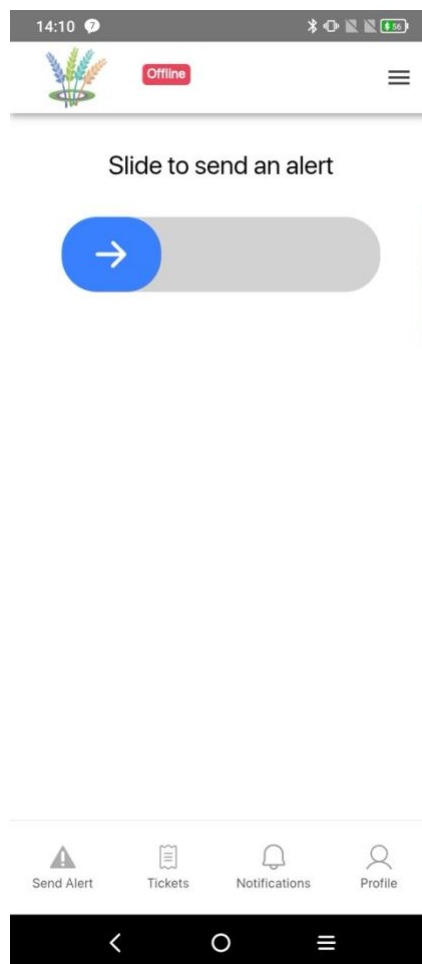


2.2 Offline functionalities

IMPORTANT: To use the offline features of the PlantHead mobile app, Users must complete the registration process while online. New registrations cannot be completed when the app is offline.

For already registered Users, it is essential to select the “Remember me” option when logging in. This ensures access to the app’s offline functionalities.

1. When accessing the PlantHead mobile app offline, the homepage of the app [26] will display a top menu with the connection indicator in red “Offline” on the top left and a collapsed menu in the top-right corner. At the bottom, the **menu** will display all the four sections of the app. However, when offline, Users will be able to navigate the sections *Send Alert* and *Tickets*.

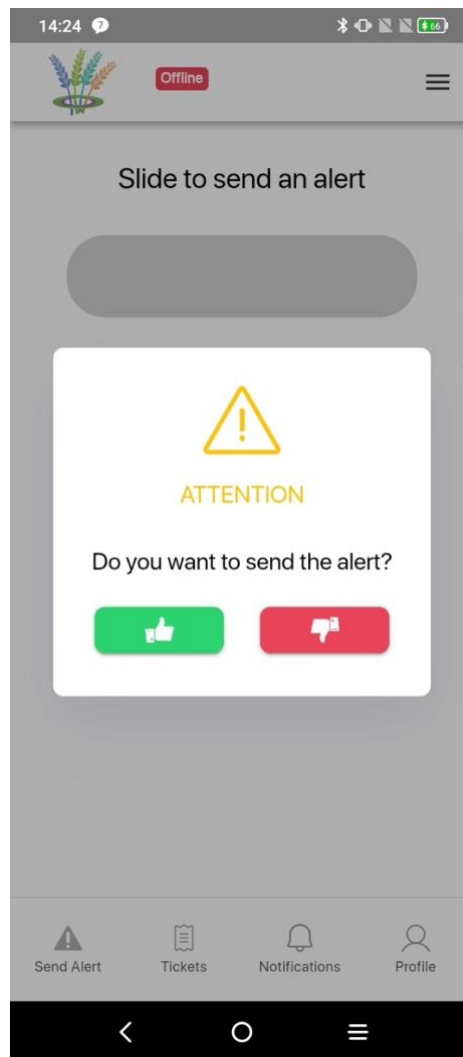


26 - The homepage of the app in offline mode





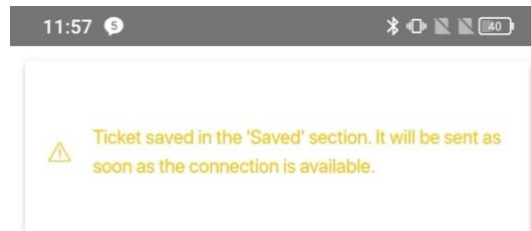
2. The default page displayed is the **Send Alert** section, through which Users can create an Alert Ticket that will be automatically saved in the app. Specifically, a blue arrow will appear, and the Farmer will be able to send a ticket by sliding the blue arrow to the right. By sliding the blue arrow to the right, the alert will be sent. After submitting the alert, a pop-up [27] will ask you to confirm the request.



27 - The pop-up to confirm the alert in offline mode

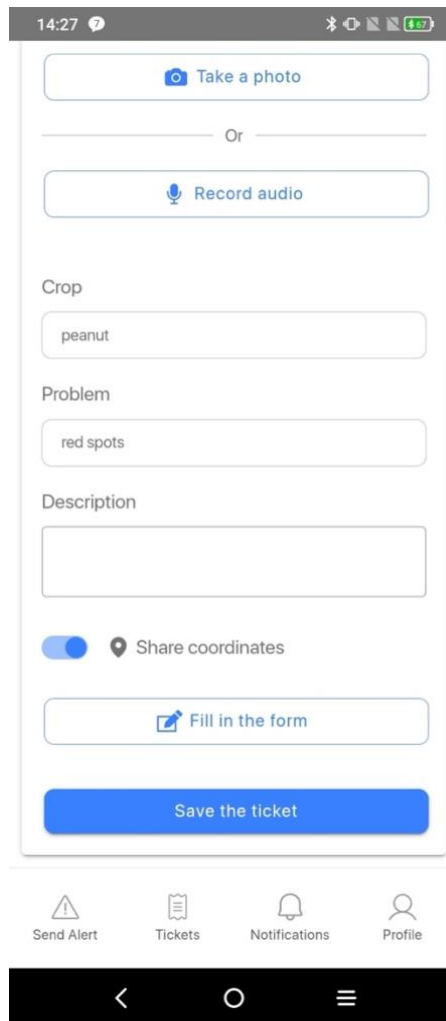
3. Once the alert is confirmed, the **update page of the Alert** will be shown. At the top, a yellow banner will appear with the following message: “Ticket saved in the ‘Saved’ section. It will be sent as soon as the connection is available”[28].





28 - The banner confirming the ticket has been saved

- In the update page of the Alert section, Users can integrate the Ticket with further information (please refer to Section 2.1 “Online functionalities, point 7). Once finished, Users can save the ticket with the updated information by clicking on the “Save the ticket” button at the bottom [29].

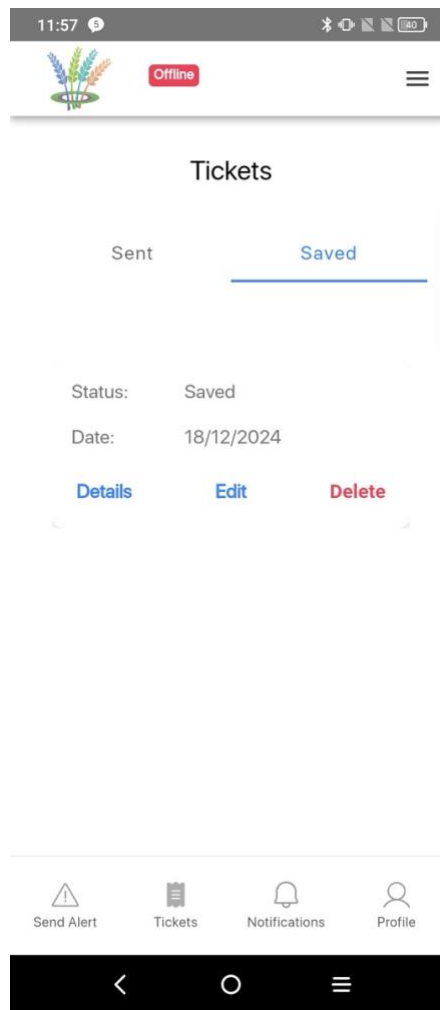


29 - The update page of the alert to save the ticket





5. By clicking on the **Tickets** button on the menu, the page will show two sections, “*Sent*” and “*Saved*” [30]:
- In offline mode, the section **SENT** will not display any ticket cards;
 - The section **SAVED** will display the cards of tickets created by the User while in offline mode.

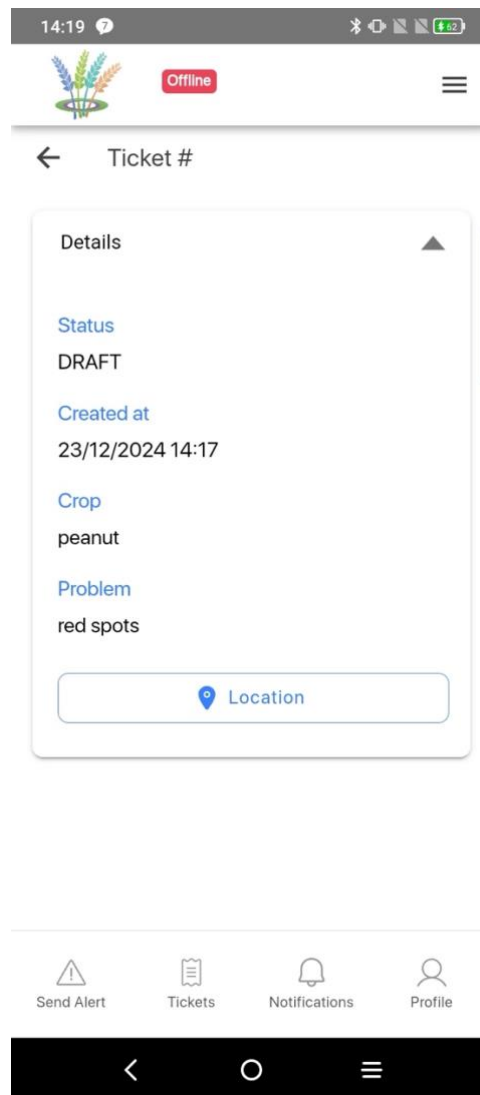


30 - The Saved section of the ticket menu

6. For tickets in the **SAVED** section, by clicking on the left button “*Details*,” Users can open the ticket card [31] and view all the details related to the ticket (Status, User code/Name, date of creation, Crop, Problem, Description). By scrolling down, more sections can be viewed (please refer to Section 2.1 “Online functionalities, point 12, items a-c).

Please note that the Comments section will not be displayed while offline.





31 - The details of a saved ticket

7. By clicking on the central button “*Edit*,” Users can edit the ticket details. After editing, the User must click on “Update Ticket” to save the changes made.
8. By clicking on the left button “*Delete*” Users can delete the ticket they created in offline mode. **Please note that it is not possible to delete a ticket when the latter has been sent.**





IMPORTANT: For tickets created in offline mode to be automatically sent when the Internet connection is restored and the app is back online, Users should either:

- ***Keep the app open on their smartphones, or***
- ***Keep the app in background***

If the User closes the app while offline, he/she must reopen it once the Internet connection is available in order for the tickets to be sent automatically.

9. Once the app is in online mode, the ticket will be automatically sent and marked as “in progress”, and the local node will take care of it.





3. FAQ

1. Who can use the app?

The app can be used by Service Users with the role Farmer or by users with other roles (Scholar, Extension Service, Other) who have requested and activated the possibility to submit tickets.

2. On which devices is the app available?

The app is available on all Android and iOS devices.

3. Who are Service Users?

Service Users are the farmers in the Farmer Field Research Units.

4. Who are Service Providers?

The partners of the Project will be Service Providers, who will precisely carry out the diagnosis on the farmers' requests.

5. What do I have to do to start using the app?

To use the app, download it from the Google Play Store (Android) or App Store (iOS), register as a new user, and wait for approval by an Admin. If you are already registered, log in. Once in the app, slide the arrow to send an alert.

6. Can I save a ticket and complete it later?

Users can always edit a ticket even after it has been submitted. When the app is online (there is an internet connection), the alert is sent immediately.

7. What happens if I do not have an Internet connection when I create a ticket?

When the app is offline, the ticket is temporarily saved as a draft and automatically sent as soon as the connection is available again.

How are tickets saved offline sent?

Tickets saved offline are sent automatically when:

- The app remains open and the internet connection returns;
- The app remains in the background and the internet connection returns.

8. What happens if I close the app before tickets are sent?

If you close the app before the tickets are submitted, when the internet connection returns you need to reopen it for the ticket to be submitted automatically. The ticket will not be lost but will remain in the 'SAVED' section of the tickets menu.

9. How do I receive the diagnosis and solution?

As soon as the experts have identified a diagnosis and solution to the problem, the ticket will be marked as resolved. The user will receive a notification on the phone and can view the solution attached to the solved ticket.

10. I sent the Alert, but I did not receive an answer. What can I do?

First, you should check if the alert is present on the ticket menu page. If you sent the alert and it is correctly shown in the register as "in progress," you should wait for an answer from the Node. The high number of requests requires a double-check by the nodes, and for this reason, it could take up to a few





hours to receive a response. However, the diagnosis is made in real-time, while additional time is needed to process an adequate response.

11. Can I see the solution to my ticket even when I am offline?

Yes, in order for the user to view the solution offline, the solution must be downloaded to the phone as soon as it is assigned to the ticket. To do this, simply open the solved ticket, scroll down and open the solution section, click on ‘Download solution’ and confirm the saving on your smartphone.

12. Can I ask for further clarification after receiving a diagnosis?

Yes. The user can use the Comments section of the ticket to request further information from the experts.

13. What can I do if the app does not work properly?

If you experience problems with the app's operation, please contact OCCAM at the following e-mail addresses: occam@occam.org; giovanni.zanoni@occam.org; info@ewabelt.eu. We will be at your disposal to solve your problem.

14. How can I delete my account?

You can delete your account by accessing the ‘Profile’ section, scrolling down and clicking on the red ‘Delete Profile’ button.

15. Are there tutorials or resources to learn how to use the app and the platform?

OCCAM provides a dedicated weekly support service, every Wednesday on Zoom, from 2 to 3 p.m. (CET), at the following link:
<https://us06web.zoom.us/j/84004582748?pwd=c5nz380Ros1cnAtJPyXBaB5EWvHy1n.1>.

In addition, OCCAM organizes ad hoc bilateral training sessions. To organize a session, simply send an e-mail to occam@occam.org, indicating: first name, last name, e-mail, and partner institution for each of the participants and giving an approximate date and time.

