

client

GRAP9461

Design Discipline Project
User Experience Design

Lecturer

Becky Lu

Assignment 2
High Fidelity Prototype

s3978746
Nguyen Ngoc Huyen

Book

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Persona

Everything starts with the persona

**Rice farmers in
Southern Vietnam**

Tuan



Age: 40
Sex: Male
Occupation: Vegetable farmer
Location: Southern Vietnam

Casual user

Biography

Nguyen Van Tuan is a skilled rice farmer operating in the fertile land of southern Vietnam. He has years of experience in the agricultural sector. However, due to the small-scale of his farming operations and the limited resources available, Tuan is hesitant to invest in advanced agricultural technologies.

Personality



Conditions & Resources



User story

“

As a farmer who is operating a small scale farm and struggling with pest control, I want to access to better and affordable pest management solutions and knowledge, so that I will not overuse pesticides and maximize the profit.

”

Goals

- **Optimize crop yield:** Tuân aims to maximize the yield of his vegetable crops to ensure a steady income for his family and sustain his farming operations.
- **Enhance efficiency:** He seeks ways to improve efficiency in farm management and production processes to reduce costs and increase profitability.

Task

- **Implement crop rotation:** Tuân plans to rotate crops strategically to break pest cycles and reduce the need for chemical pesticides, promoting soil health and biodiversity on his farm.
- **Participate in farmer networks:** He engages with local farmer networks and agricultural extension services to exchange knowledge, learn about sustainable farming practices, and access resources for pest management and crop protection.

Needs & Expectations

- **Effective pest management solutions:** He requires access to effective pest management solutions and guidance to control pests without resorting to excessive pesticide use, preserving crop health and environmental sustainability.
- **Traditional farming support:** He needs support and resources to optimize traditional farming methods and practices, enhancing crop management and productivity within the constraints of his farm scale.
- **Quality agricultural inputs:** Tuân seeks reliable sources of fertilizers and pesticides to ensure the health and productivity of his crops, emphasizing the importance of authenticity and quality assurance.

Frustrations & Concerns

- **Pest management challenges:** Tuân experiences frustration in managing pests effectively, leading him to resort to using pesticides excessively to protect his crops from damage.
- **Technological limitations:** He is frustrated by the limitations of technology adoption in small-scale farming, hindering his ability to modernize farm operations and improve productivity.

Anxieties

- **Concerns about pesticide efficacy:** Tuân worries about the effectiveness of pesticides and the risk of crop damage if pests are not adequately controlled, leading him to use more pesticides than instructed.
- **Enhance efficiency:** He feels frustrated by the difficulty of adopting advanced agricultural technologies in his small-scale farming operations, which limits his ability to improve efficiency and productivity.

Pain point

- **Pest Management Challenges:** He encounters difficulties in managing pests effectively, pests developing resistance to pesticides, making control efforts less effective.
- **Fake pesticides and fertilizers**

Motivations

- **Innovation within affordable methods:** Tuân is motivated to innovate within the constraints of affordable farming methods, seeking alternative approaches to improve crop management and productivity.
- **Desire for quality inputs:** He seeks reliable sources of fertilizers and pesticides to ensure the health and productivity of his crops, expressing concerns about the prevalence of fake or poor-quality inputs in the market.

Key Insights

**Rely heavily on chemicals
to protect the crops from
the resistant pests**

**Looking for alternative
approaches to manage
pest effectively**

Resistant pest

What are resistant pest?

Pests' drug resistance is their ability to withstand a larger amount of drug than the initial amount of drug used, because the drug is used frequently and repeatedly. The situation of drug-resistant pests greatly affects the crops, causing farmers to increasingly have to use a larger amount of pesticides, which is both costly and pollutes the environment as well as affects users' health. The increasingly diverse types of drug-resistant pests also make it very difficult for farmers to control pests in the fields, leading to great damage to crops.

How to treat them

- **Natural pesticides and scent:** From easily found ingredients - garlic, chillies, citronella, onion, ginger, ...
- **Sounds:** Bats, bee, raptor's cry, machinery noise, fast/slow music,...
- **Light:** Yellow, Blue, Purple
- **Vibration:** from 20 to 120kHz
- **Heat:** from 35 to 60°C



Hypothesis

Problem Statements

Tuan, is a rice farmer in southern Vietnam who needs an user-friendly platform with an alternative pest management solution because he wants to maximize the crop yield and increase profitability.

Hypothesis Statements

If Tuan uses a remote farm assistant device using a hyper-spectral sensor, paired with a pest detection and control application, to monitor his farm and control pest daily then Tuan can maximize the crop yield and increase profitability.

What

An assistant device paired with an app to monitor the farm and give daily reports. It can move around on its own and rotate 360 degrees then notify the farmers about the real-time pest and disease. It provides solutions to help farmers control timely and remotely the pest situation.

Who

Rice farmers in Southern Vietnam who encounter problems in managing the pest effectively. They increase the dosage to combat resistant pests and rely heavily on chemicals. They are seeking for alternative pest management approaches so that they will not resort to excessive uses of pesticides.

How

The device comes in the form of a ladybug, a natural predators to the harmful insects. It's equipped with a hyper-spectral sensor to detect insects. It also allows farmer to have urgent treatments right within the device. It can spray natural pesticides and scents, light up, vibrate its wings, heat itself up and emitting sounds to chase away the insects, eradicate and protect the crops.

Why

This device helps the farmers to use different methods to treat the insects (spray, scent, light, vibration, sound, heat) rather than excessively uses the chemicals pesticides. It also to help farmer to remotely monitor the crops and pest quality, take timely actions to protect the crops and maximize the crop yield.

When

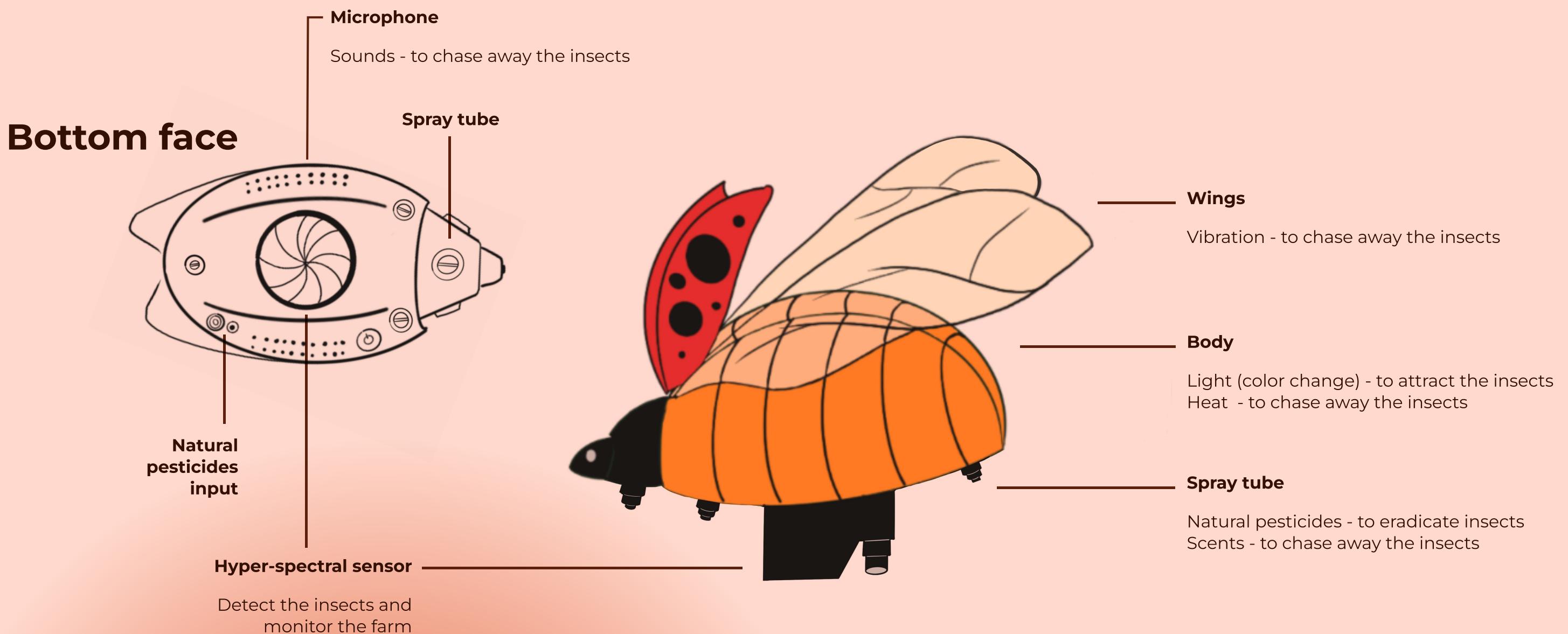
- **Device:** monitors daily, with or without the insects, ideally in the early morning when it's not too sunny. For insects treatment, it can be used anytime: right after detecting or scheduled tasks, for example: in the night to use Light to attract the insects and make them leave the crops.
- **App:** Anytime to see daily reports, and right after receiving alerts.

Where

- **Device:** monitor in the farm
- **App:** can be used anywhere, for example their home, so that the farmers can take pest control actions from anywhere, anytime.

Solution in 5W-H

Device breakdown



Why hyper-spectral?

Hyper-spectral camera are used in most of the existing biomimicry drones to detect pests. It captures the light from the infrared and ultraviolet spectrum to detect subtle differences in the way plants reflect light, from which it can indicate stress or damage caused by pests. For example, plants infested with certain insects might show changes in their chlorophyll content, which a hyper-spectral camera can pick up. It will analyzed captured datas and create high-quality RGB images of the crop field then notify the farmer.

This is really useful for resistant pest management, especially leaf rollers, a common harmful insects for rice field. They eat the flesh of the leaves, leaving only the epidermis, causing the rice leaves to reduce the area for photosynthesis and lose chlorophyll.



Scenarios

Before

Tuan encounters challenges in resistant pests and managing pest effectively. He finds it difficult to control crop damage because of resistant pest, leading to significant drop in crop yield. Therefore, he often exceeds recommended levels, increases dosage and relies heavily on chemicals to combat these resistant pests. The resistant pests are eventually's not affected by drugs or chemicals anymore even with a mixture of 2-3 drugs. It usually happens in the winter-spring crop, because in this season the weather is sunny so that the caterpillar's skin is thick, which makes it difficult to eradicate.

Furthermore, he also unknowingly purchases fakes through retailer. While fake pesticides and fertilizers may not directly cause pest resistance, their uses can indirectly contribute to resistance issues. To compete with this, he's seeking for affordable alternative approaches to improve crop management and productivity without resorting to excessive uses of chemical pesticides.

After

Tuan uses an assistant buddy called 'Ladybug' paired with an app to monitor the farm, control timely and remotely the pest situation. It comes in a form of a ladybug with a hyper-spectral sensor detecting real-time insects or any movements. The data of the sensor will be analyzed to RGB images to show the crop quality.

Everyday, early in the morning, he turns it on, connects with Ladybug's wifi so that it can connect with the app. It can moves around the farm on its own and rotates 360 degrees, then gives daily reports on crop quality and pest situation. It can automatically avoid the obstacles and adjust the hyper-spectral camera to go in/out of the body. He can remotely control the way it moves on the app. After analyzing the affected areas, Ladybug will go closer and capture the pest.

At his house, Tuan gets a notification about the insects attack on his phone. He then has remote access to all the information about the detected insects within the real-time images screen. He can also switch view to see the top-view high-quality RGB images. To have urgent treatments, first, Tuan quickly selects the parcel and treatment options within the ladybug's body, adjusts the quantity output. He can choose the suggested one based on the detected insects, crops and environmental conditions. To save time and effort, he can choose Auto-treatment or reapply the previous treatments. After activating, the Ladybug at the farm works hard to protect the crops. It sprays natural insecticides and scents to chase away the insects or light up (in the dark) to attract them. Meanwhile, he can see the treatment range and process within real-time flight map remotely. If the insects are not fully treated, he is either recommended to use Auto-treatment or schedule to ensure complete eradication. When the crop's protected, he saves the datas for further insects analysis.

Tuan



A skilled rice farmer at Southern Vietnam. He's seeking for alternative approaches to improve crop and pest management and productivity.

Goal Improve pest management to maximize the crop yield and increase profitability.

Scenario Tuan faces challenges in managing pests effectively. Pests develop resistance to pesticides, making it very challenging for him to control crop damage. Therefore, he uses an assistant buddy that moves around on its own to help him monitor the farm, give daily reports and detects insects or any problems with a hyperspectral camera. It's paired with an app to let him take remote and timely actions to control the pest situation.

Legend

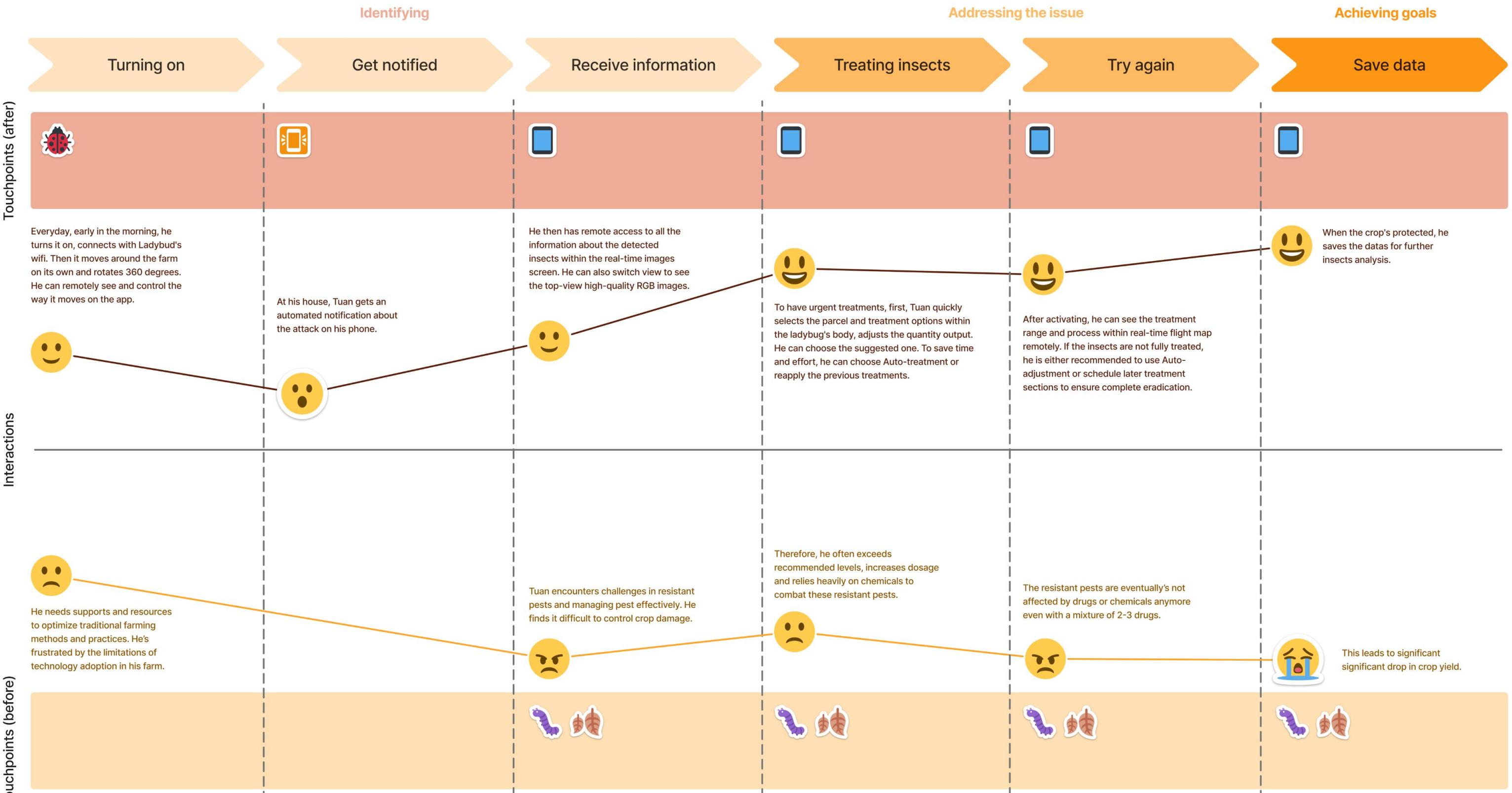
Tuan's journey



Emotions (before)



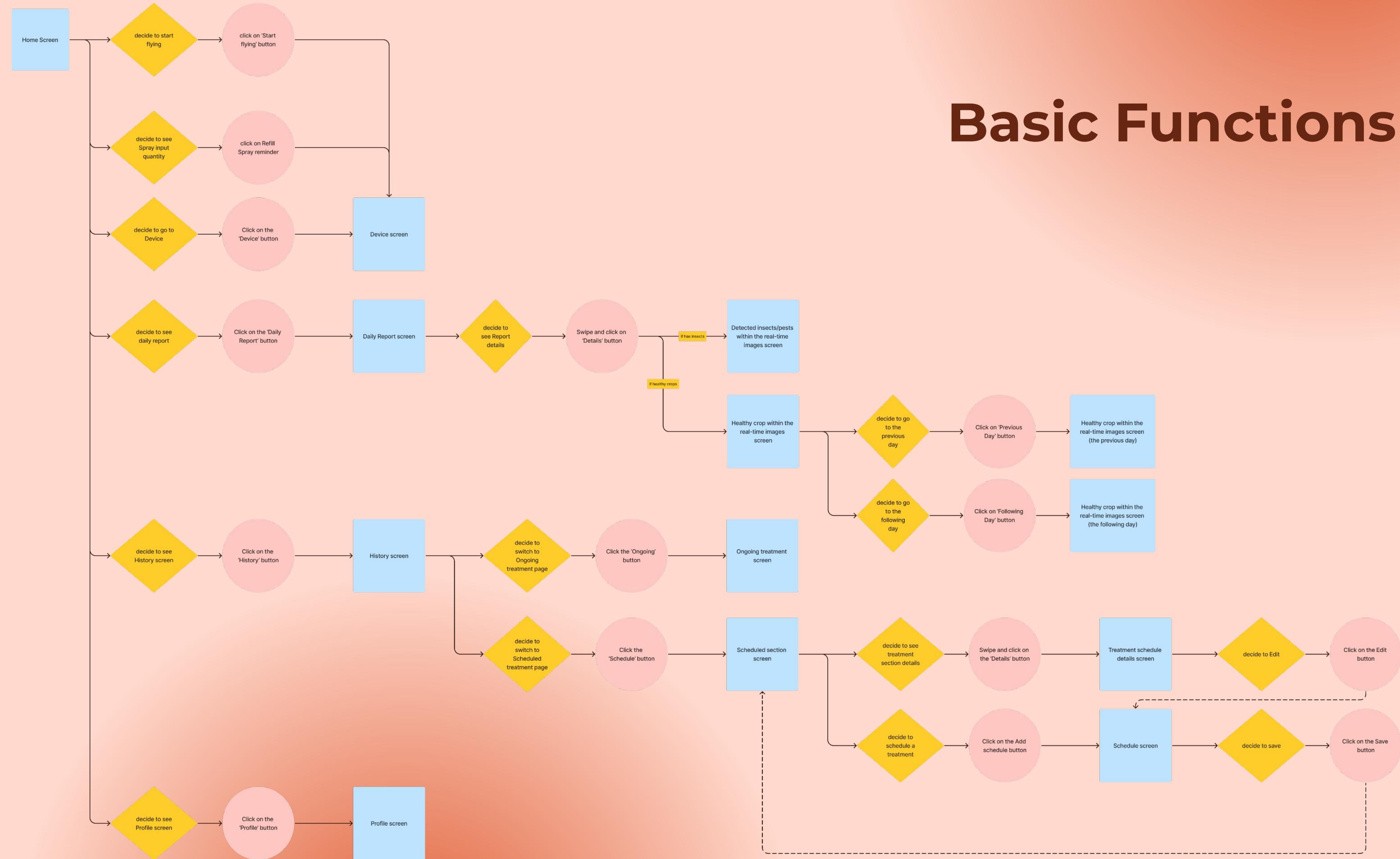
Emotions (after)



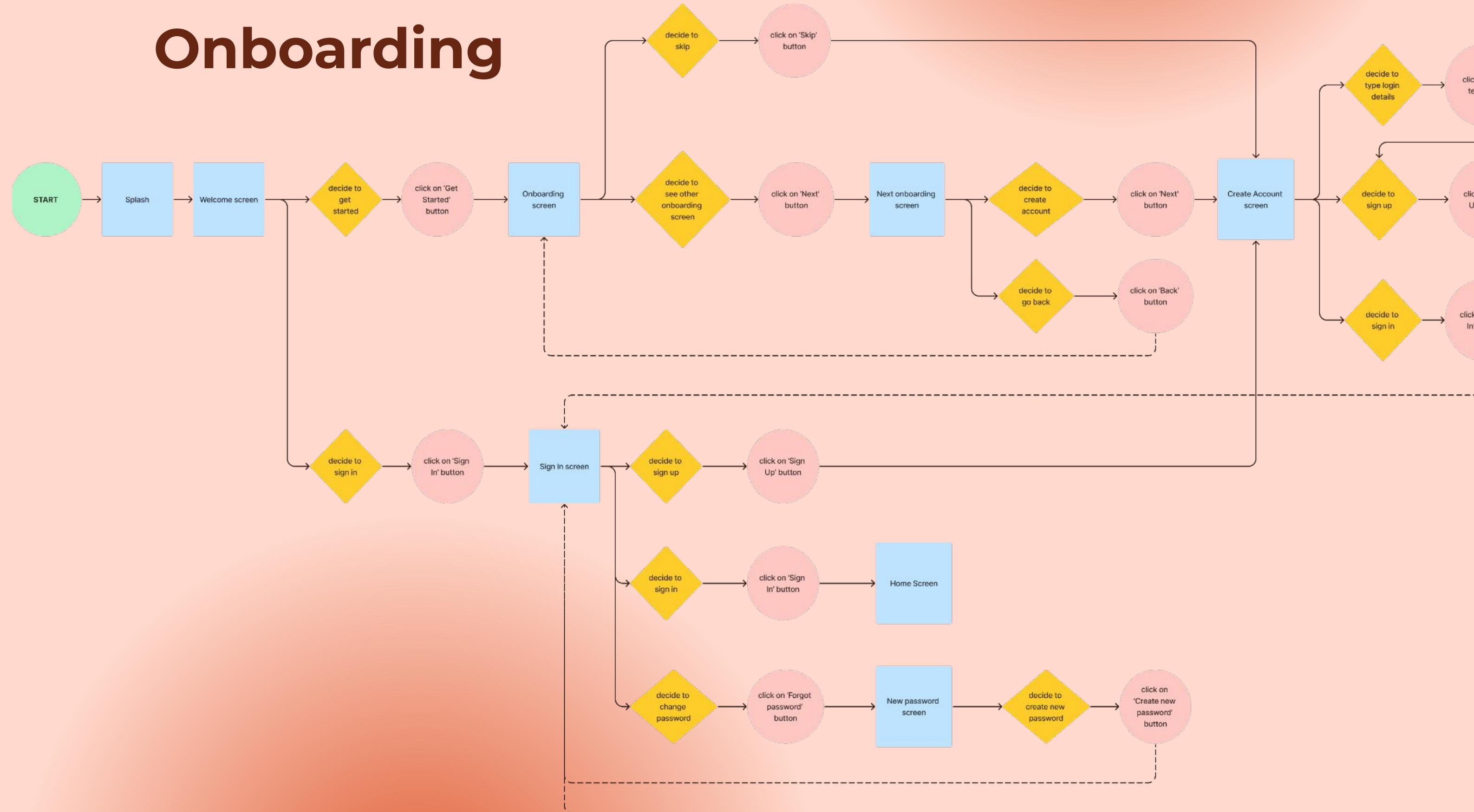
User-flow

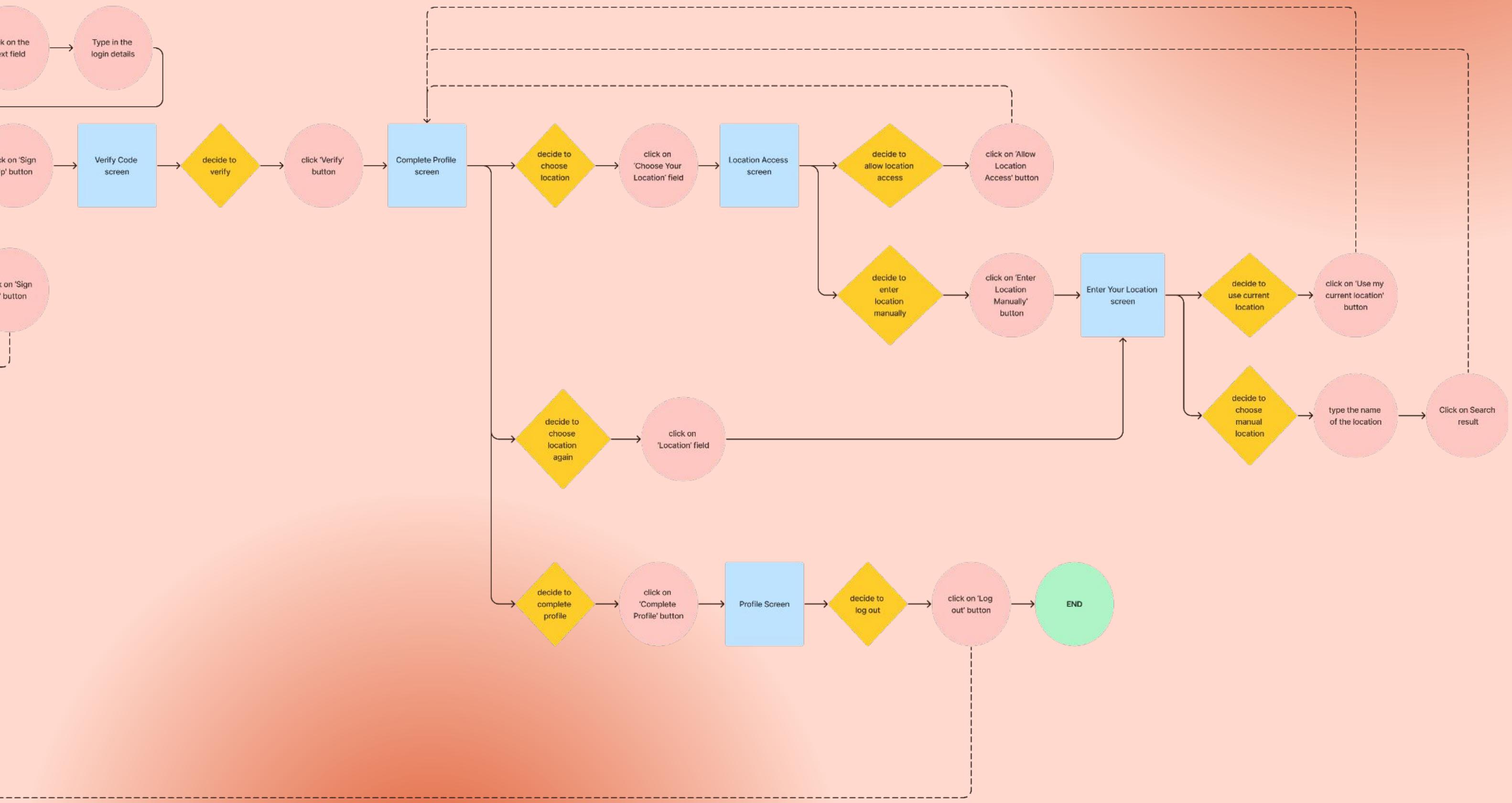
I devided a big user-flow into 3 based on the functions:
Onboarding/Sign-In, Basic Functions (navigate through
pages) and Insects treatment. Please go to the Figjam link
(final page) for a clearer look.

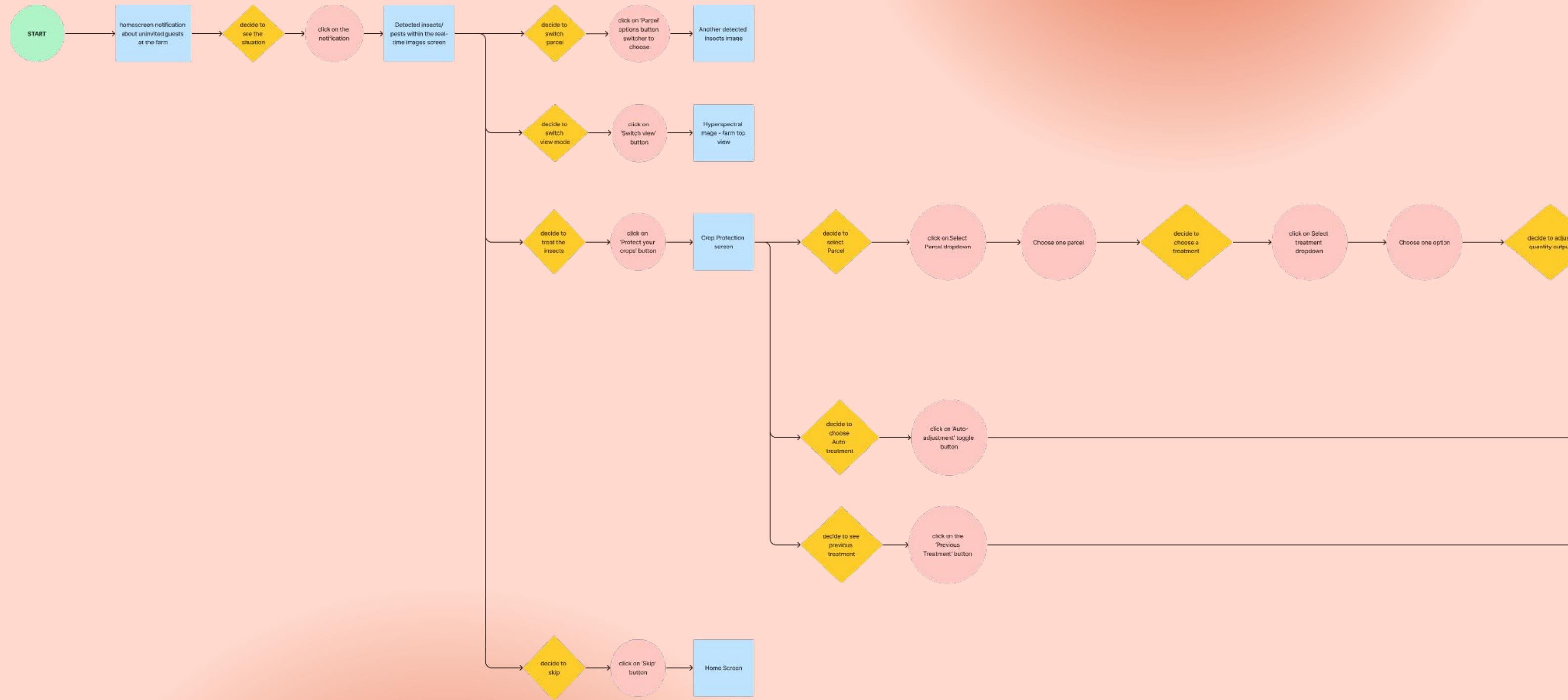
Basic Functions



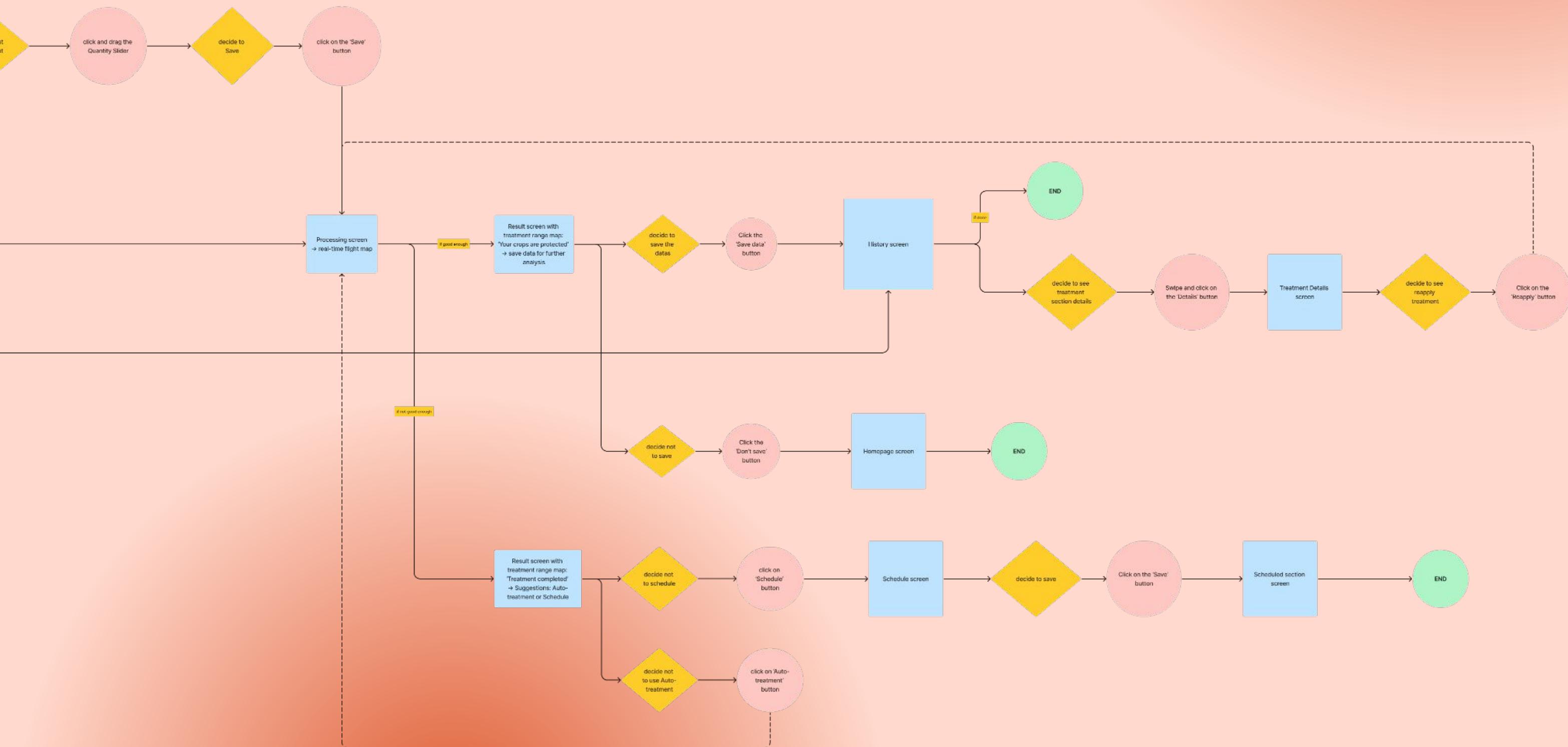
Onboarding





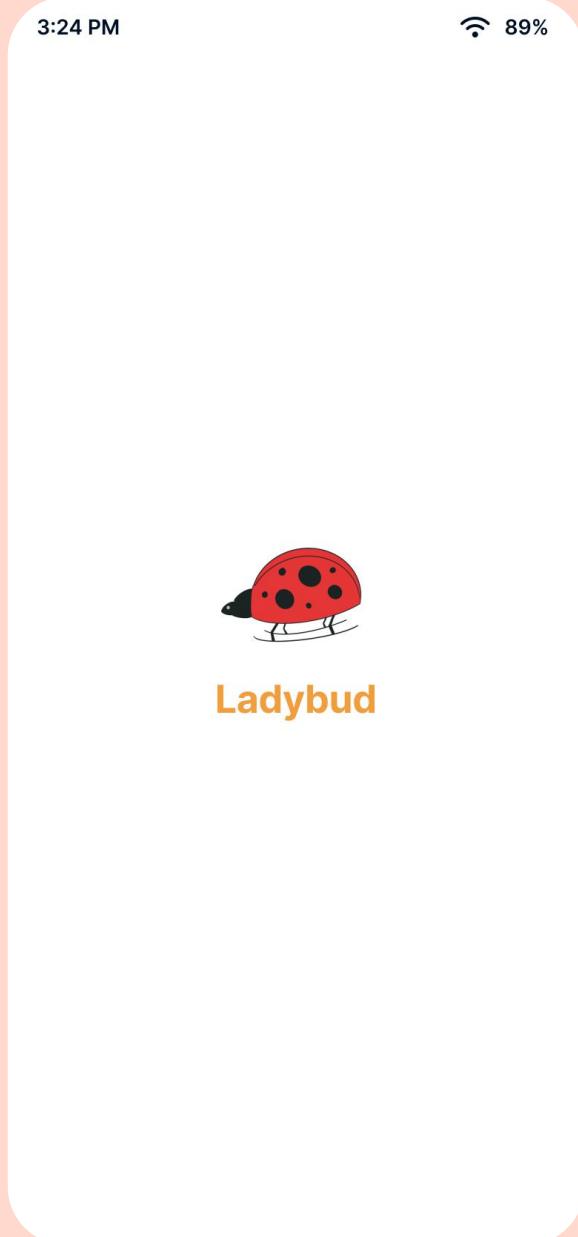


Insects Treatment

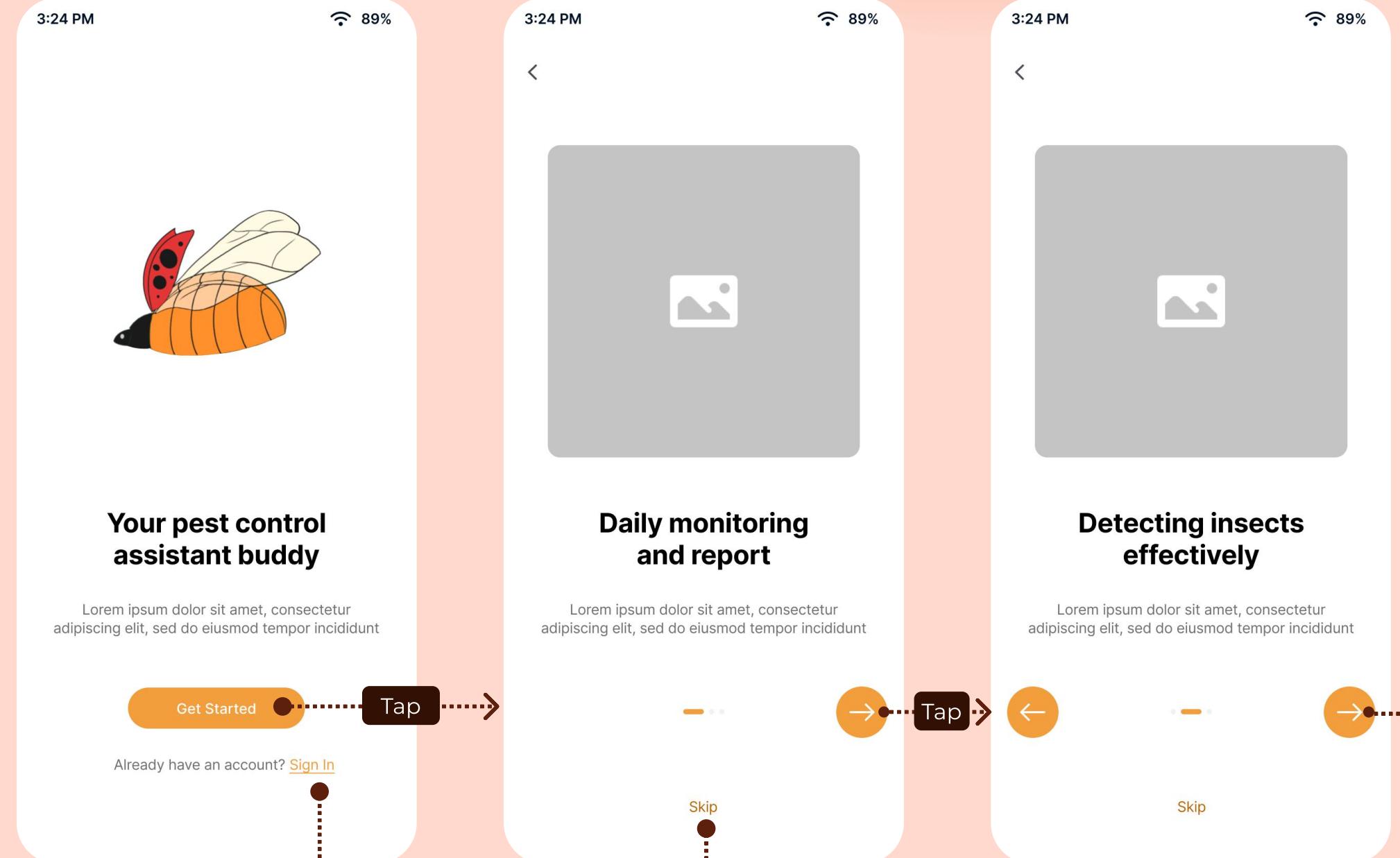


Mid-fi prototype

Welcome



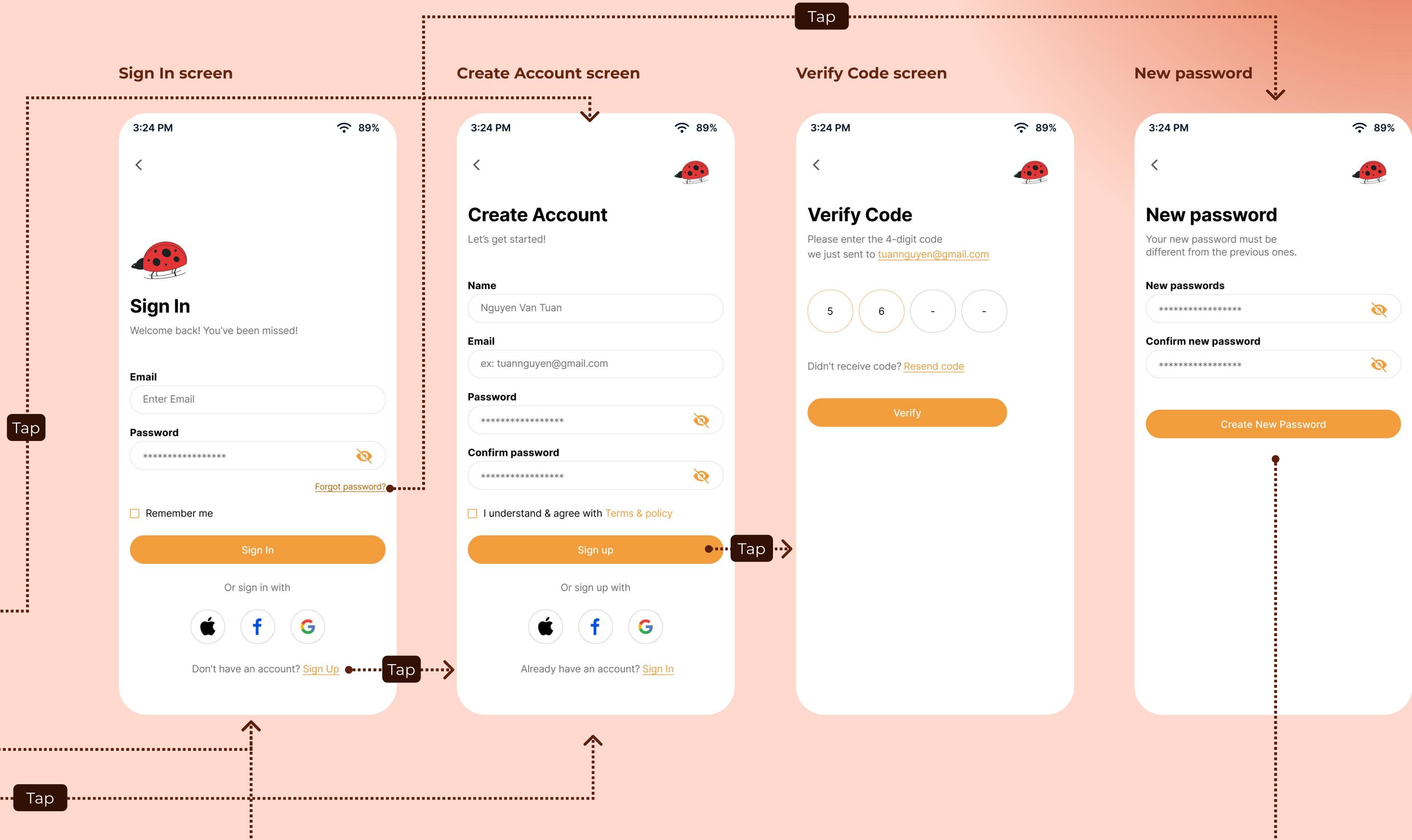
Onboarding screen



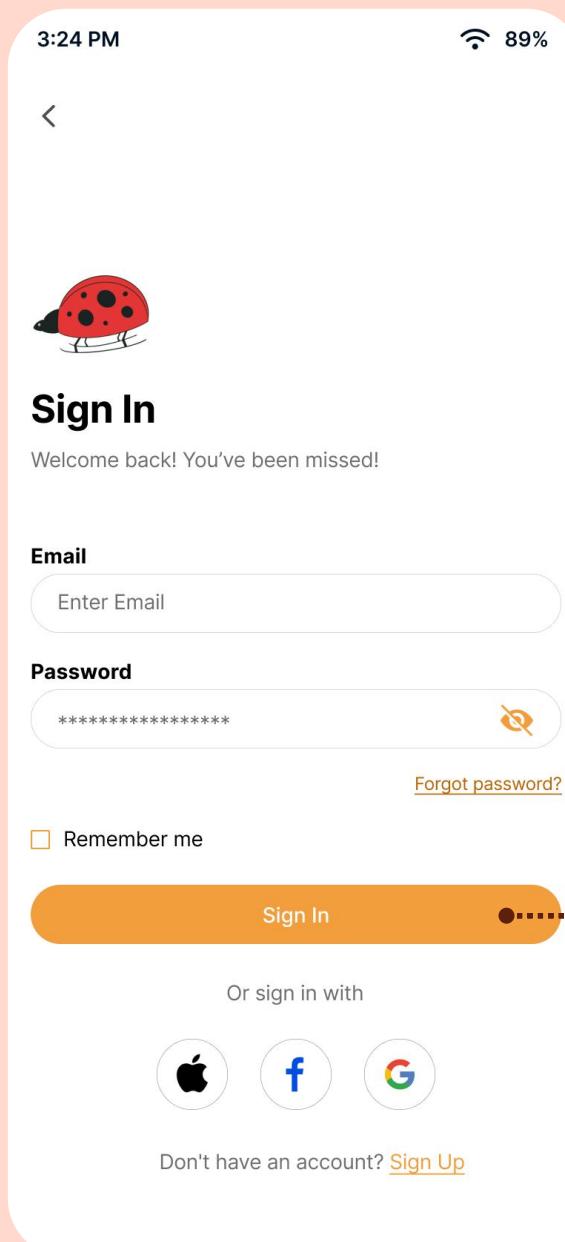
The welcome screen that introduces the new solution. Tap on Get started to see onboarding screen or tap on Sign In to sign in to the user account.

Onboarding

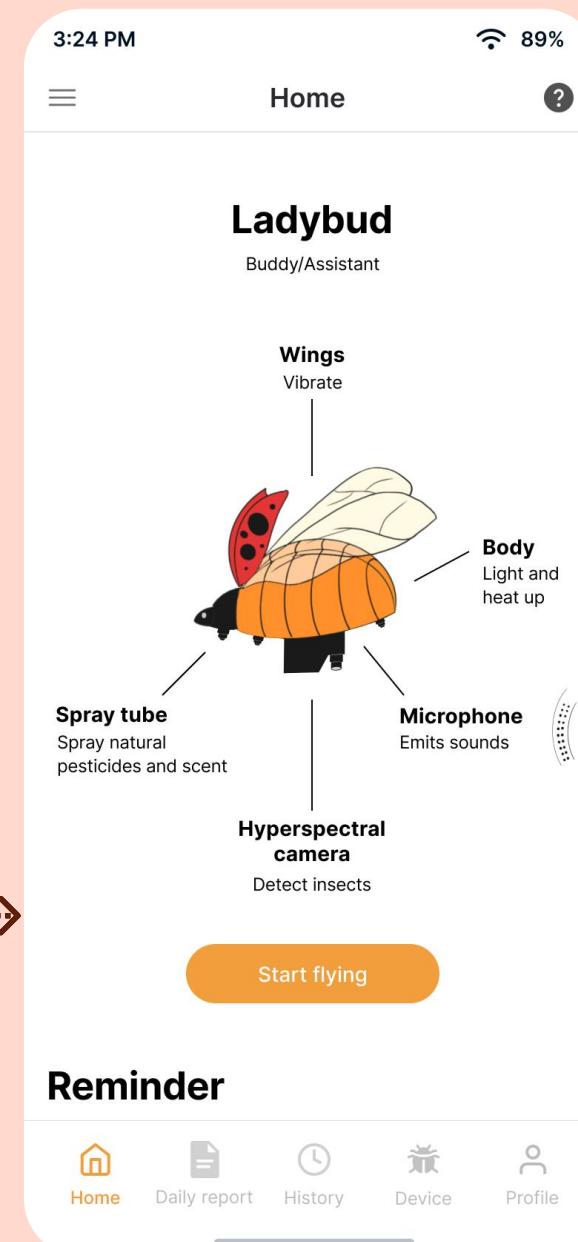
To get the user started, they need to create account or sign in to their account



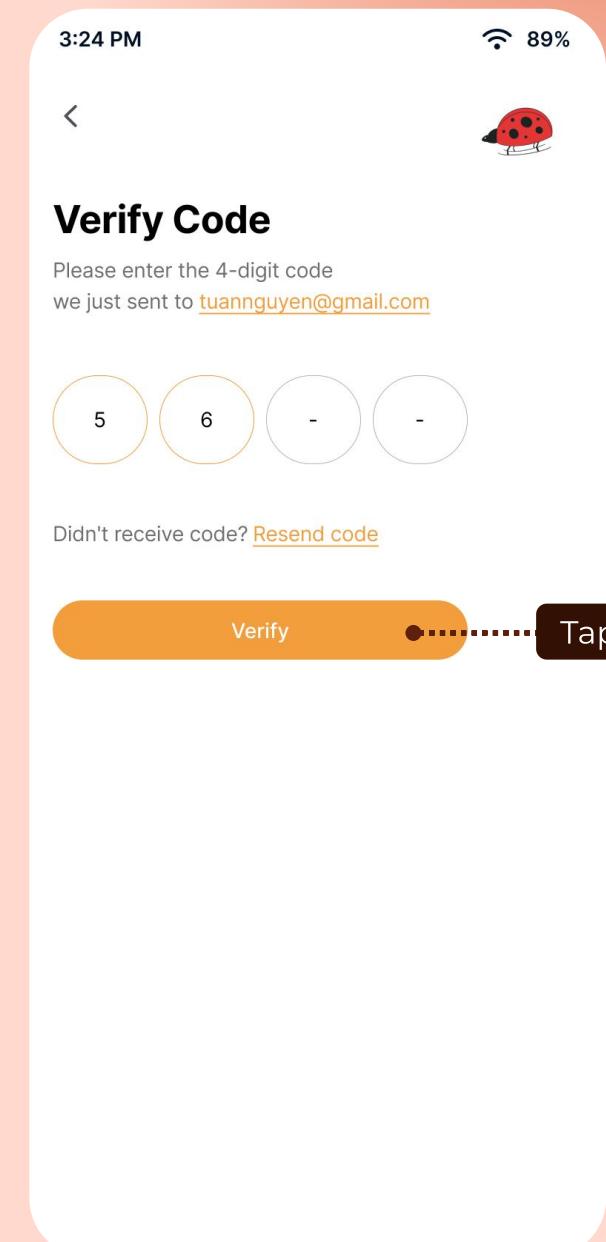
Sign In screen



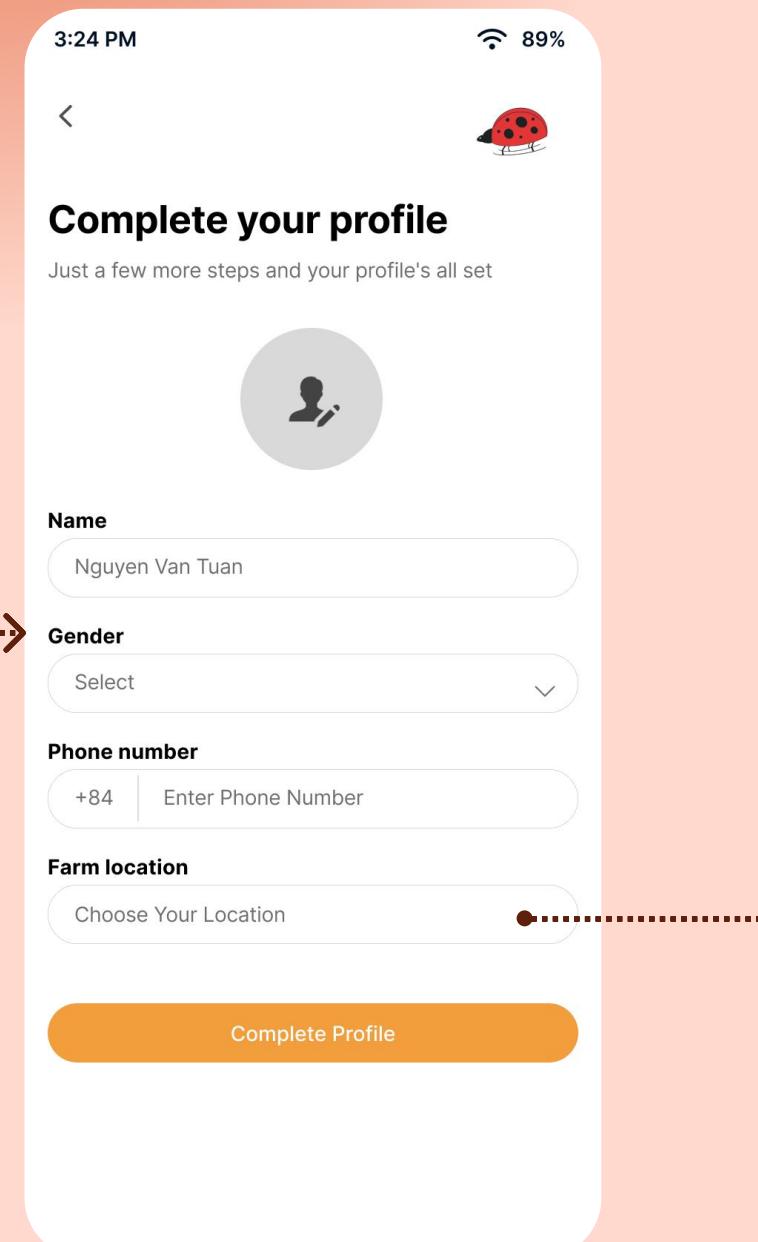
Home screen



Verify code screen



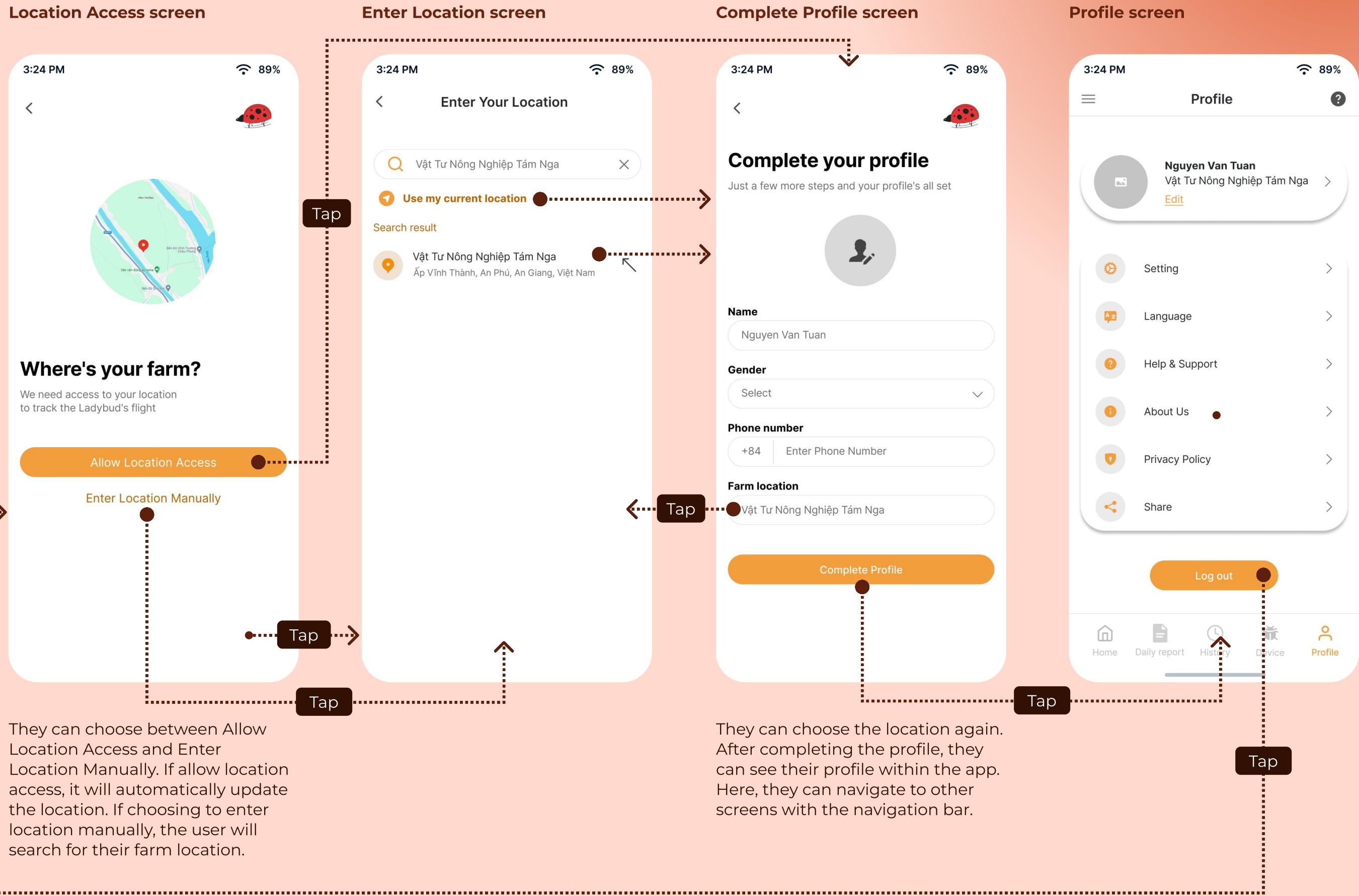
Complete Profile screen



After signing in, the user will be navigated to the Home screen.

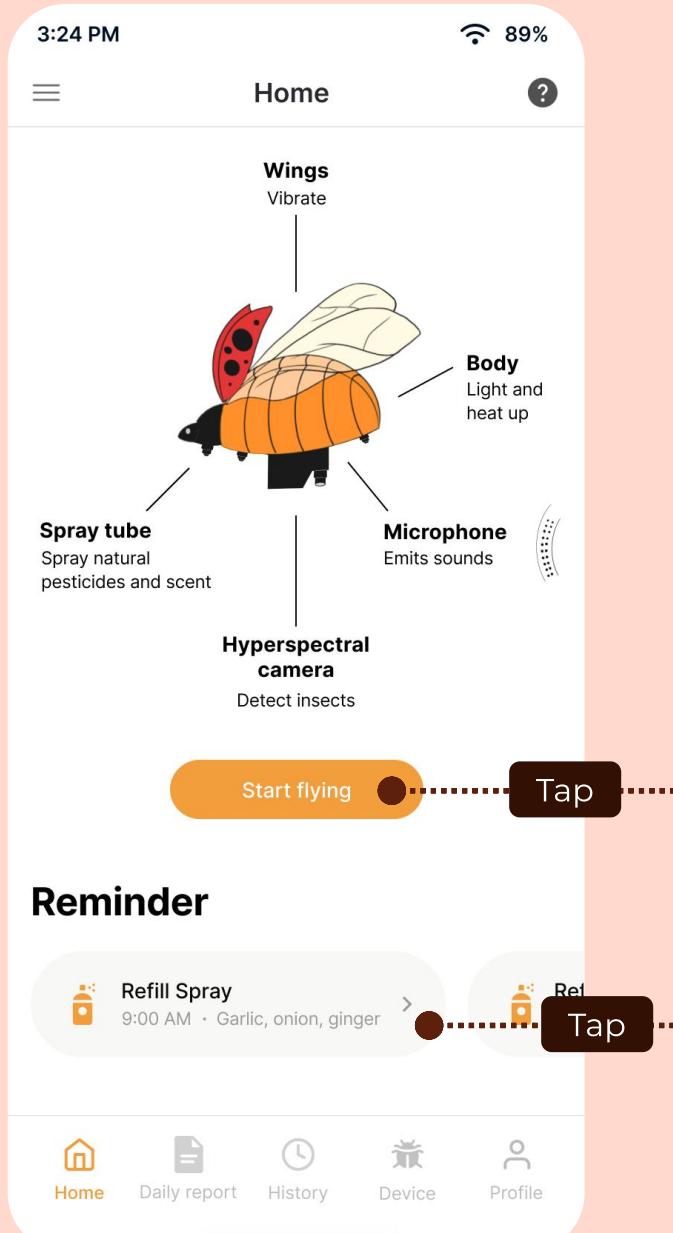
After verifying, the user will need to complete the profile.

Here, they need to choose the location.



Basic functions

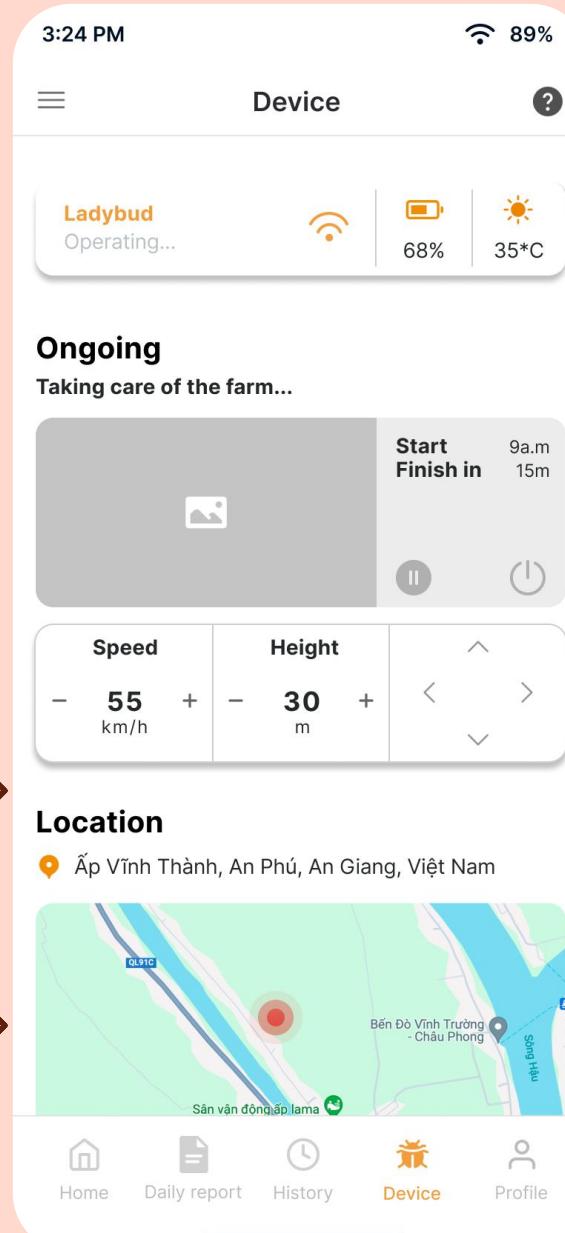
Home Screen



Reminder

Device screen

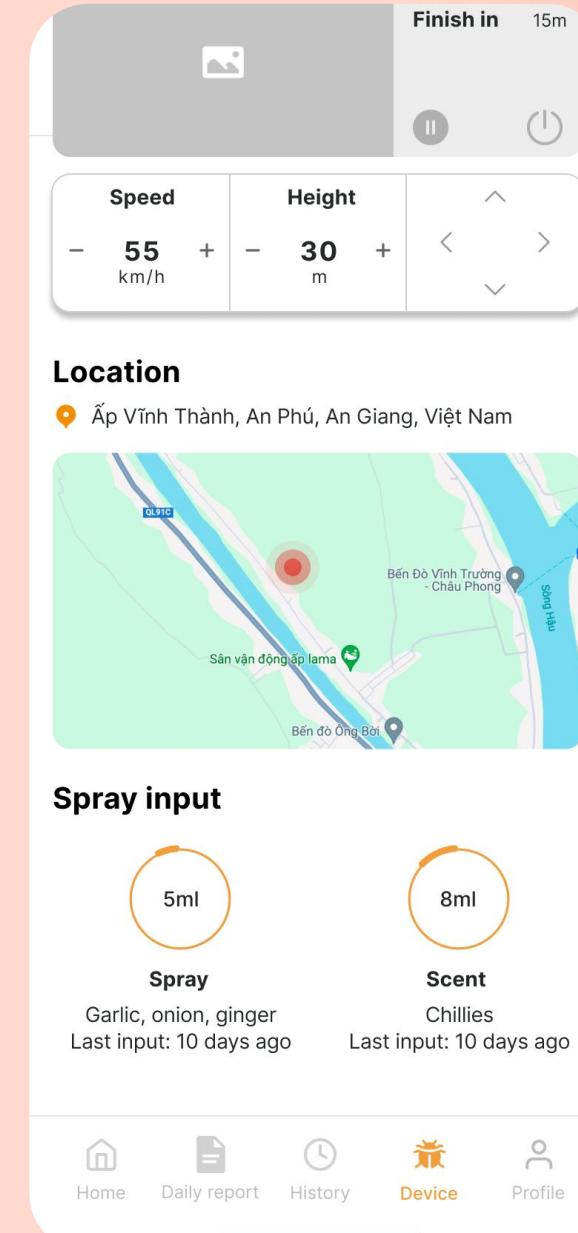
Device screen



The Home screen let the user know all the basic components of the Ladybug and what they do to help the farmer. The user tap on 'Start flying' button to start the device. They can see the reminder to refill spray.

Device screen

Device screen

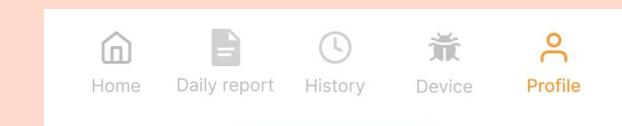


In Device screen, the users can control the way Ladybug moves, their height and speed with the real-time image of what they're capturing. They can also see the wifi connection, battery, weather conditions and the location map.

Device screen

Vertical Scroll

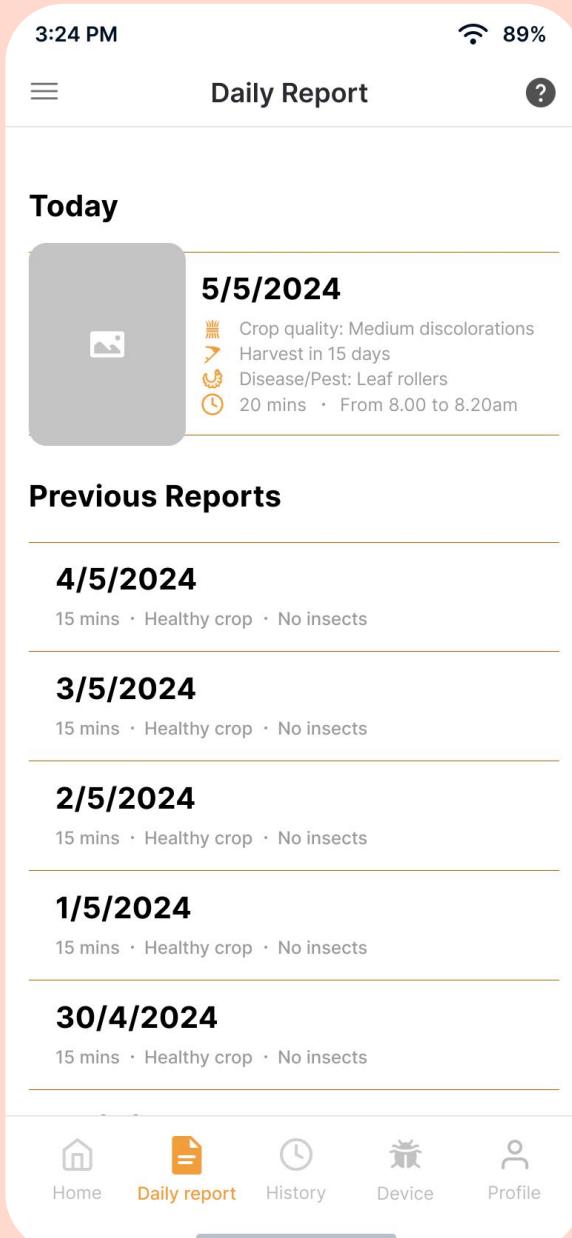
Navigation bar



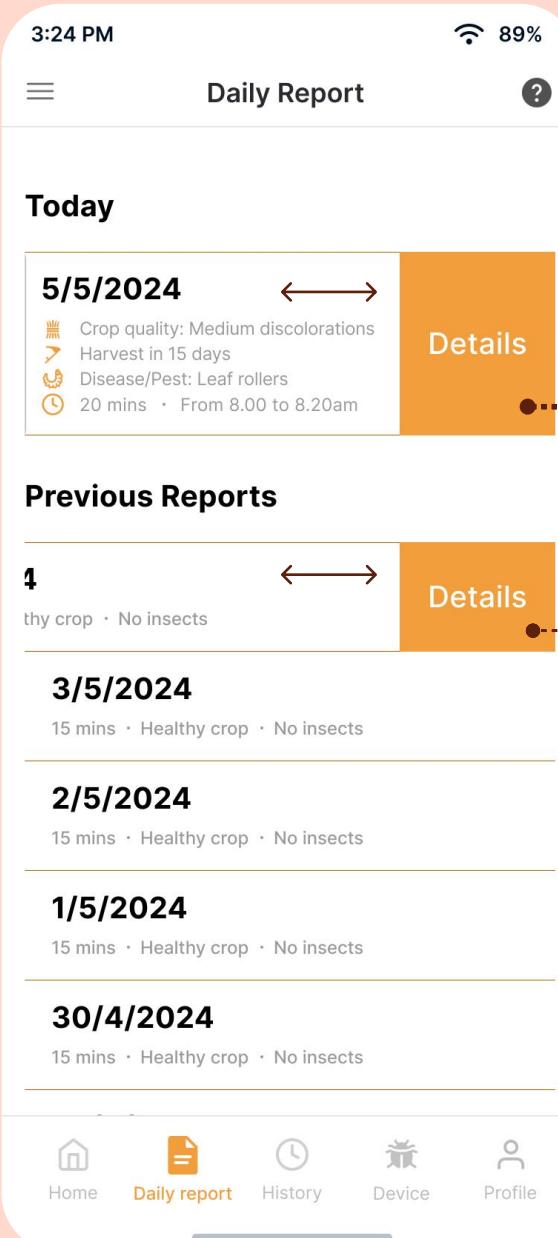
The user can scroll down to see the spray capacity.

- **Home:** click to move to Home screen
- **Daily Report:** click to move to Daily Report
- **History:** click to move to History
- **Device:** click to move to Device
- **Profile:** click to move to Profile

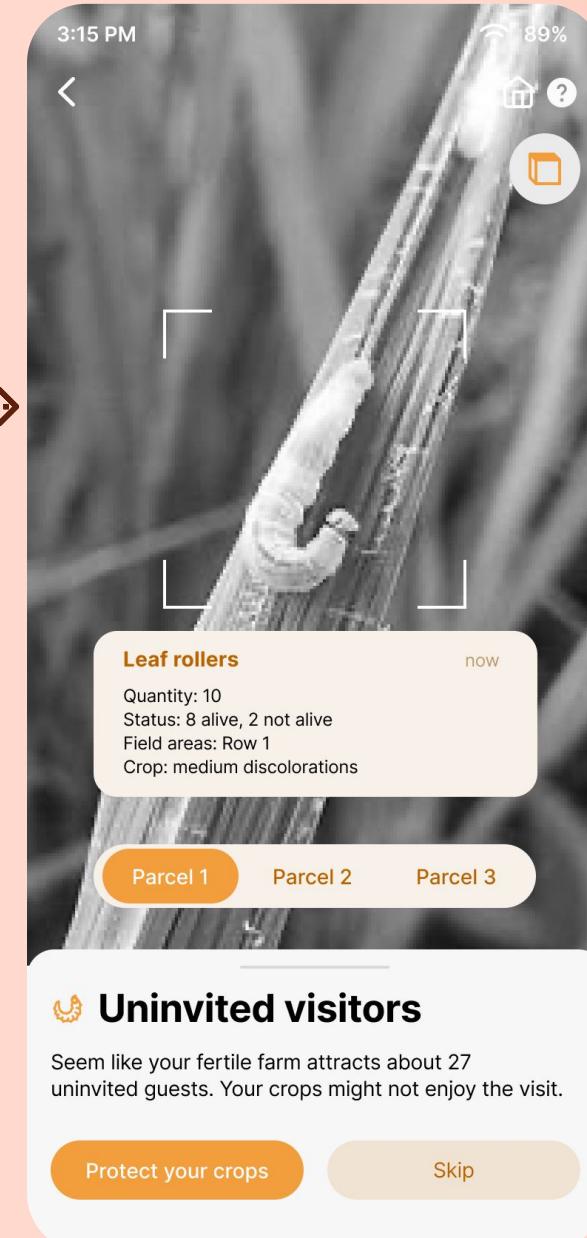
Daily Report Screen



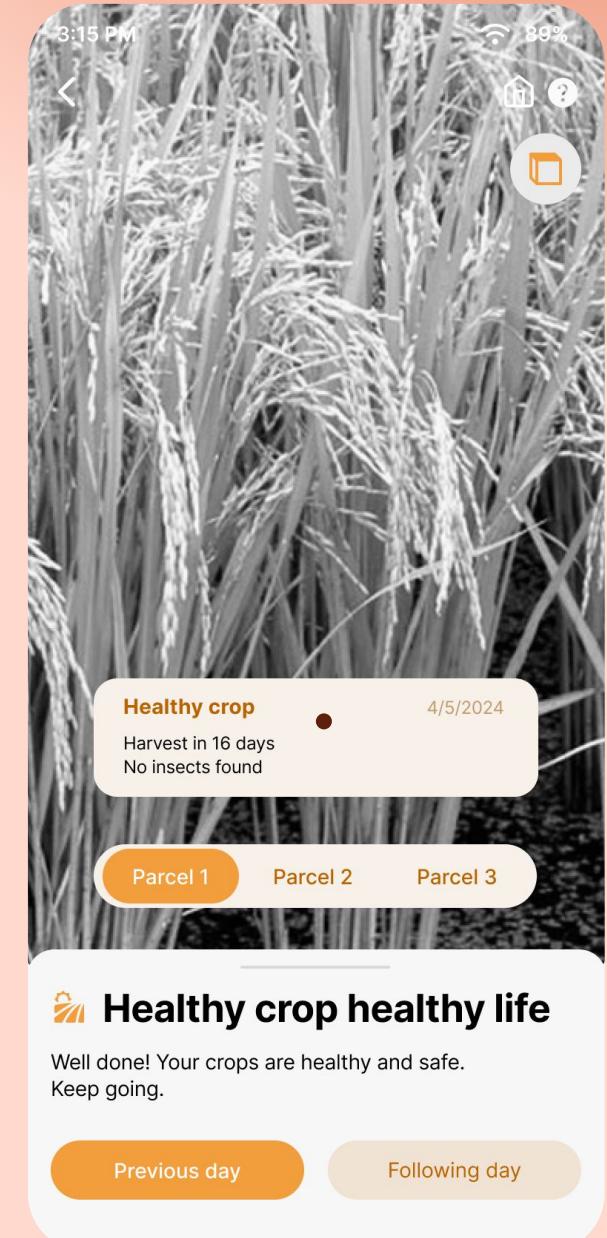
Daily Report screen



Report Detail screen (with insects)



Report Detail screen (without insects)



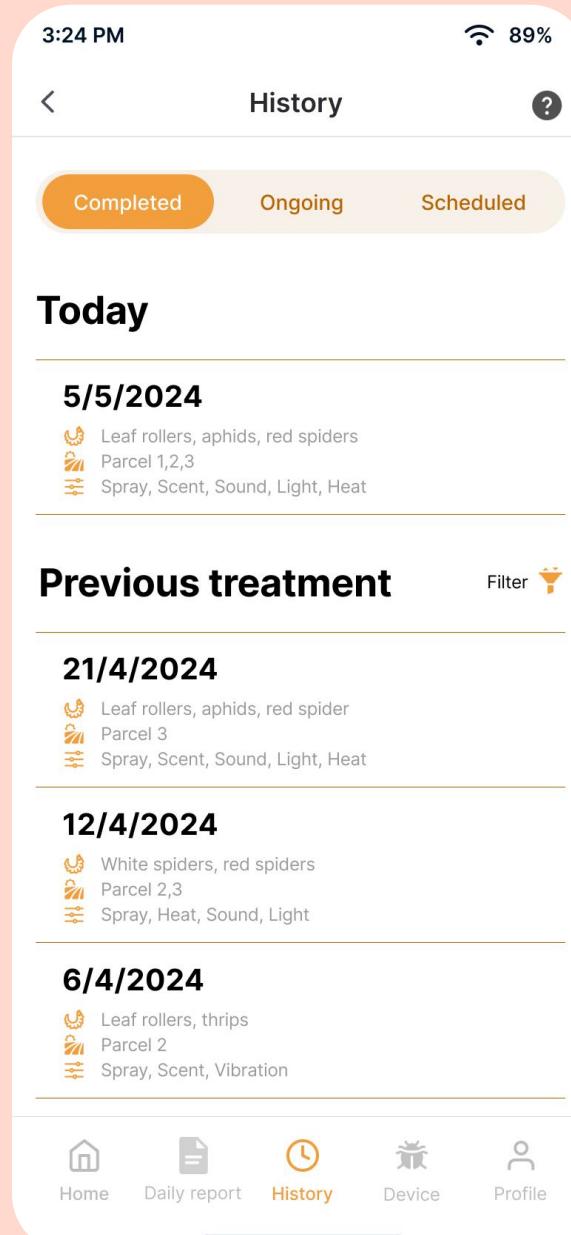
In the Daily Report screen, they can see all the reports list with the overall information. The 'Today' report has an image of the crop/pest.

To see the report, the user can swipe and tap on the Details button.

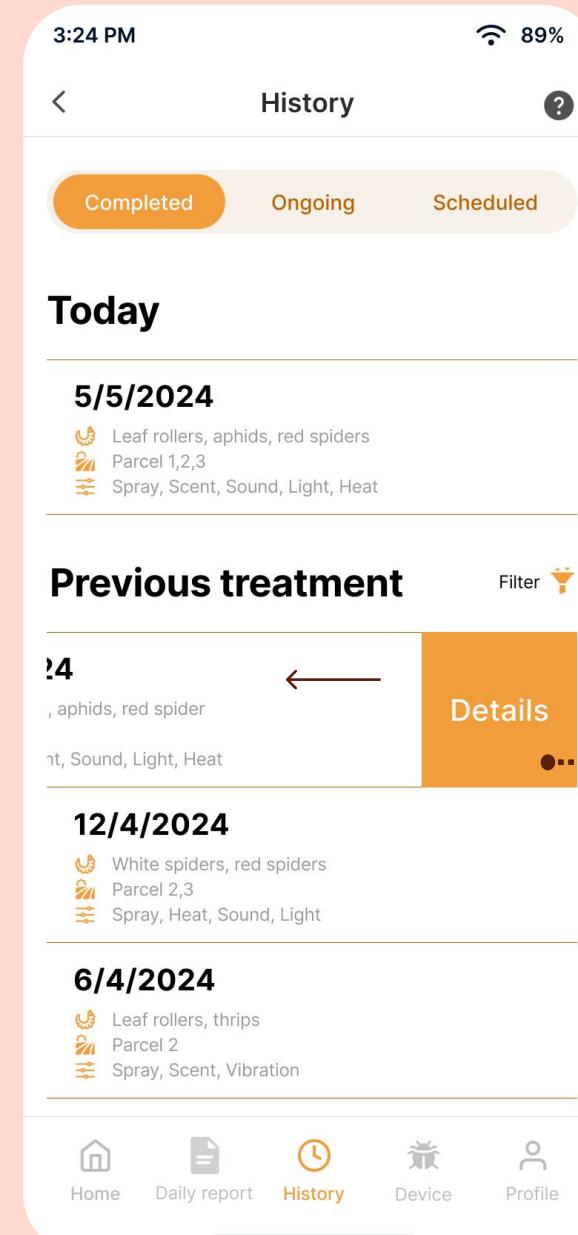
This screen let the user see all the report information with real-time images. The user can switch between the Parcel. If there's insects, it will have 'Protect your crops' and 'Skip' button.

If there's no insects, it will have 'Previous day' and 'Following day' button.

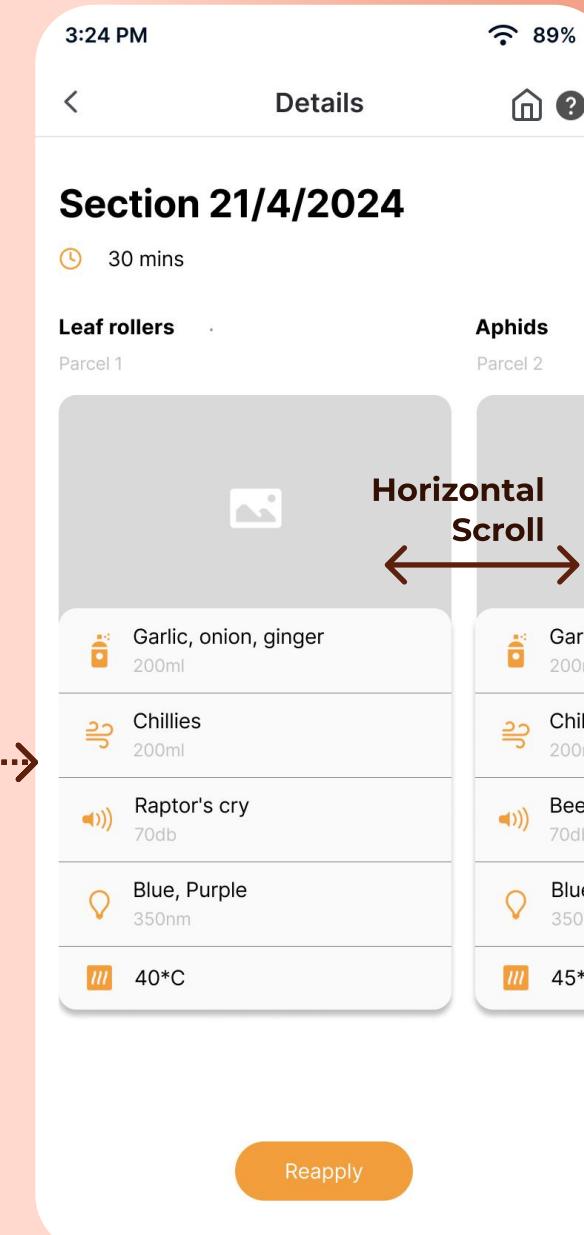
Completed treatment screen



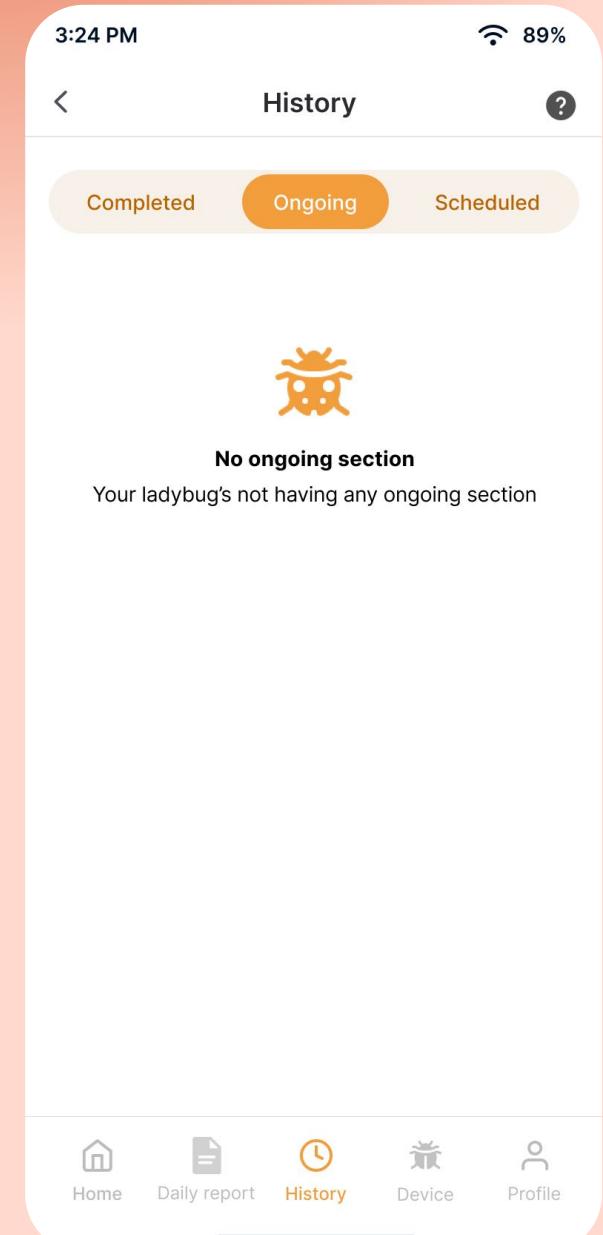
History screen



Treatment details screen



Ongoing treatment screen

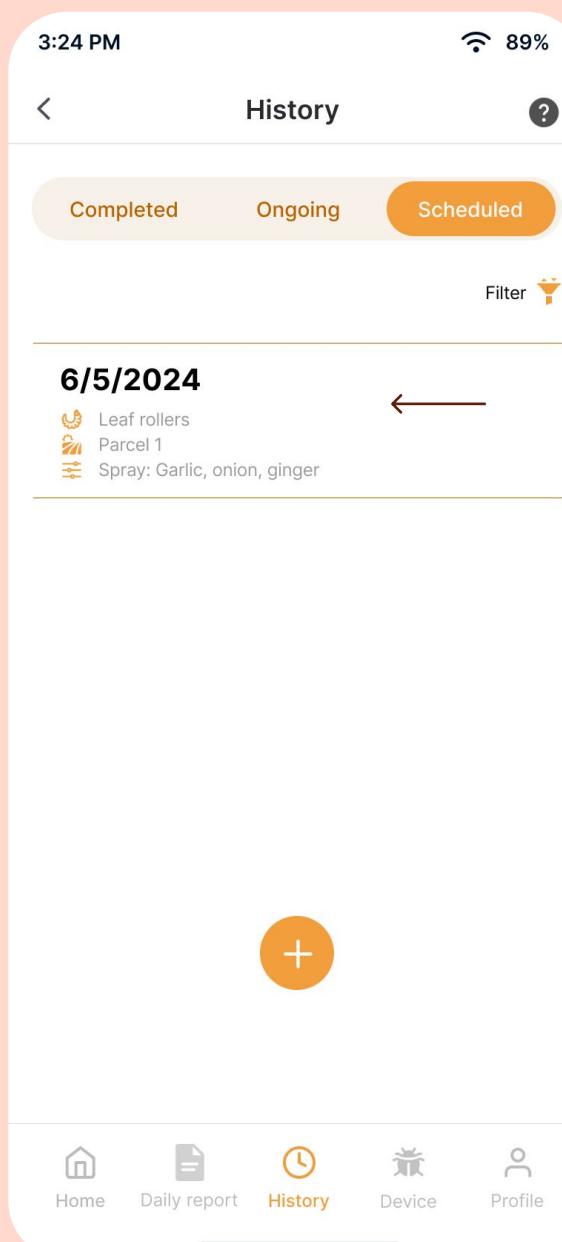


In Completed treatment screen, the user can see all the previous treatment sections by scrolling vertically. To see in details, they can swipe and tap on the revealed 'Details' button.

In this Details screen, the user can scroll horizontally to see the treatment for each insects.

The user can switch between the History pages: Completed, Ongoing, Schedule by tapping on the wanted section.

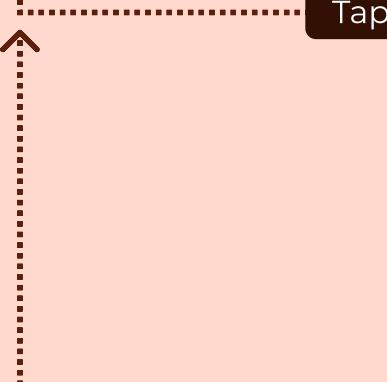
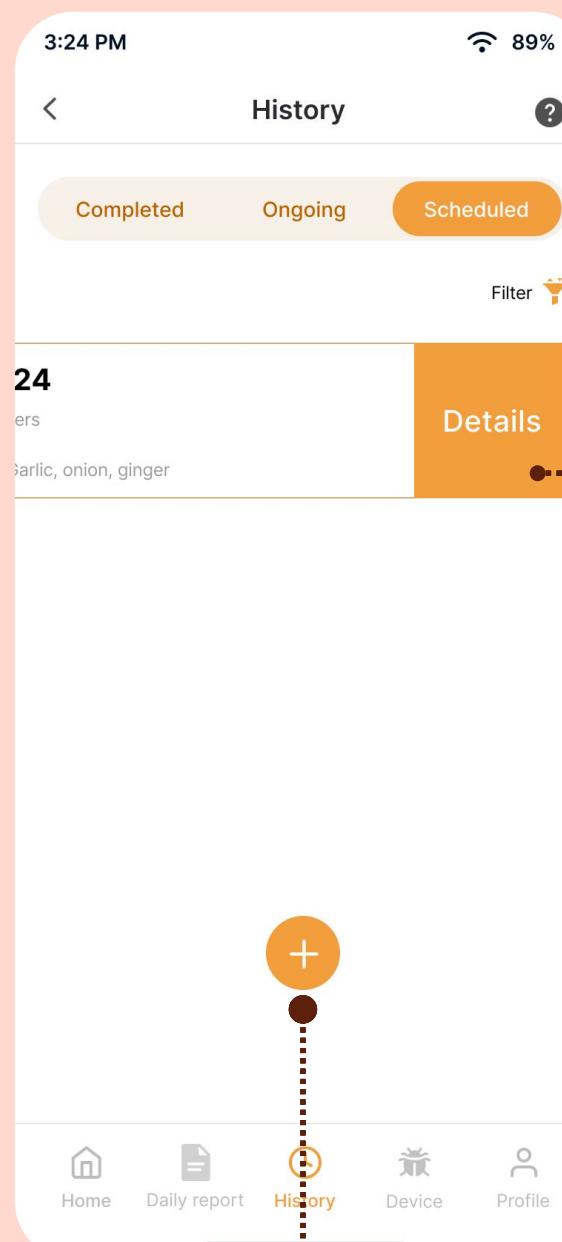
Scheduled treatment screen



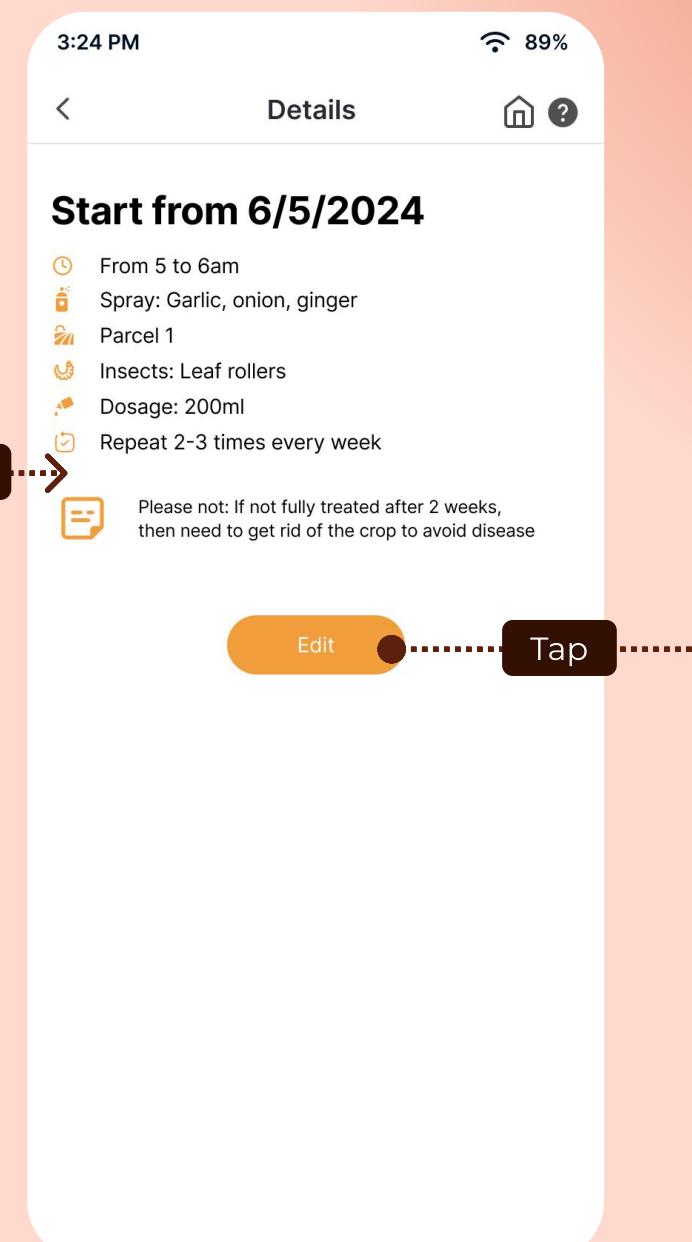
Like the Completed treatment page, the user swipe and tap on Details button to see the scheduled section details.

The user can tap on the '+' button to add more scheduled sections.

Scheduled treatment screen



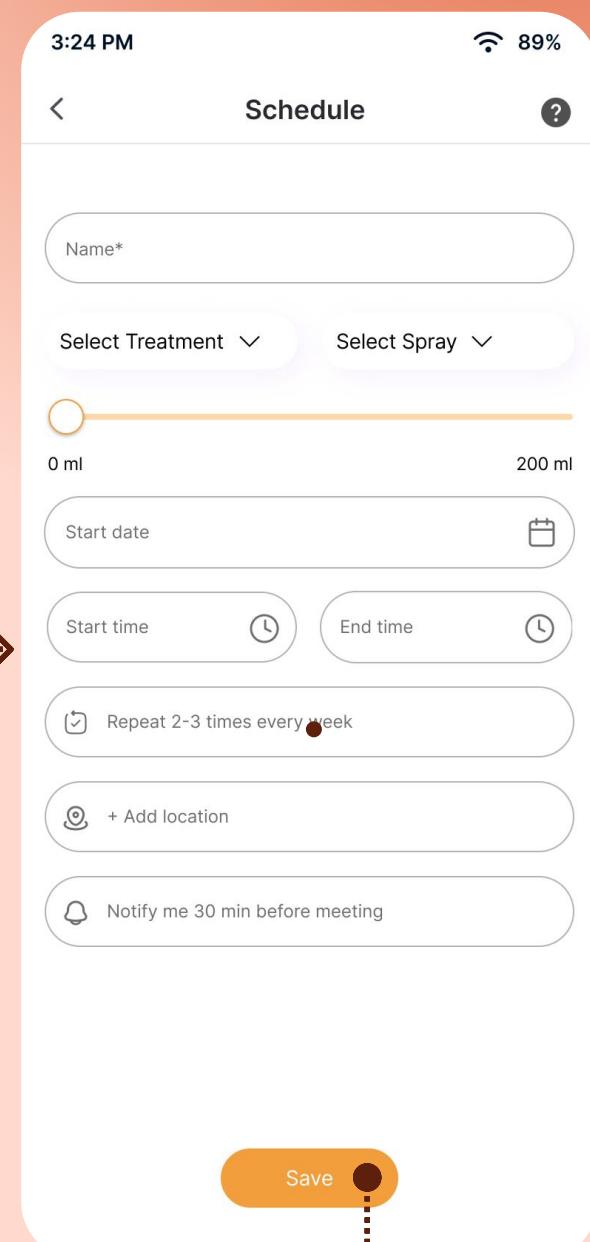
Schedule screen



They can choose the location again. After completing the profile, they can see their profile within the app. Here, they can navigate to other screens with the navigation bar.

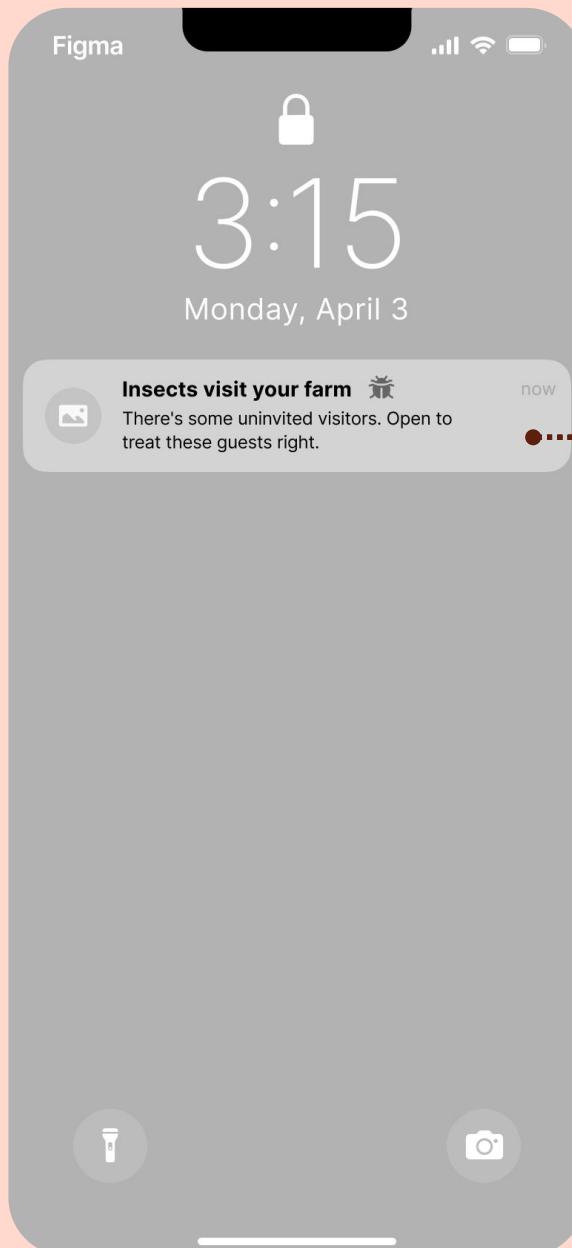


Schedule details screen

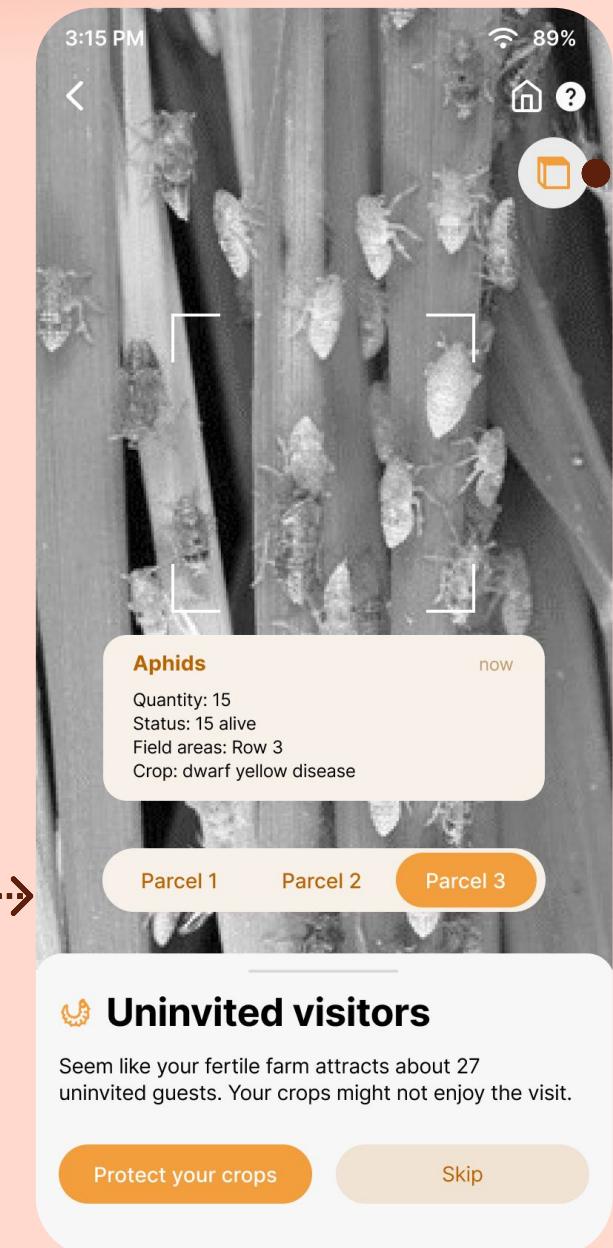
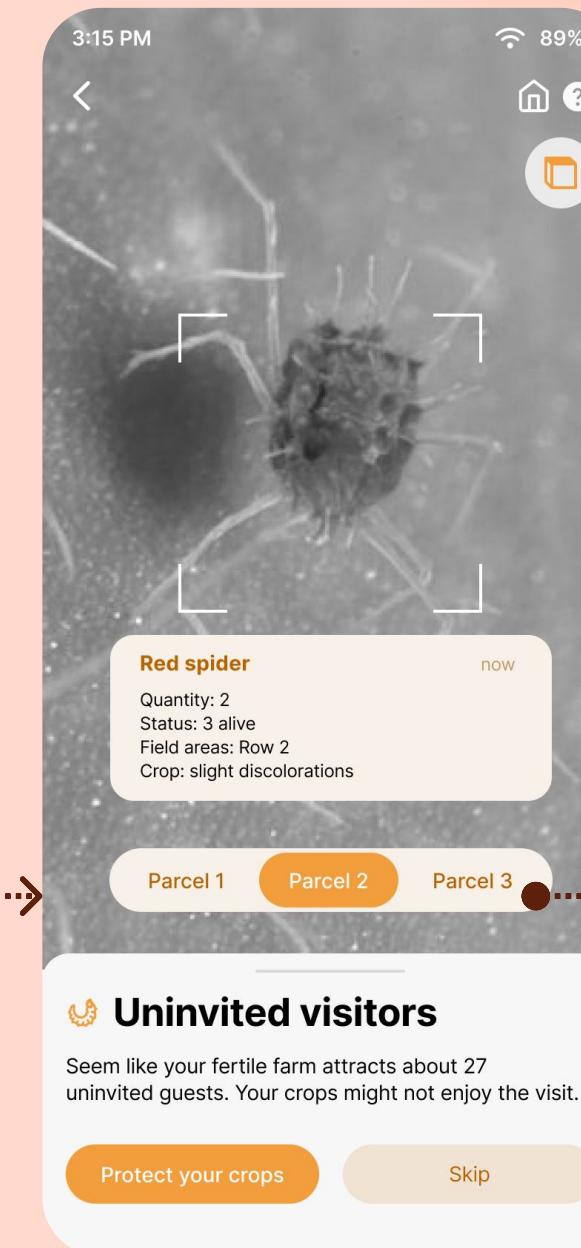
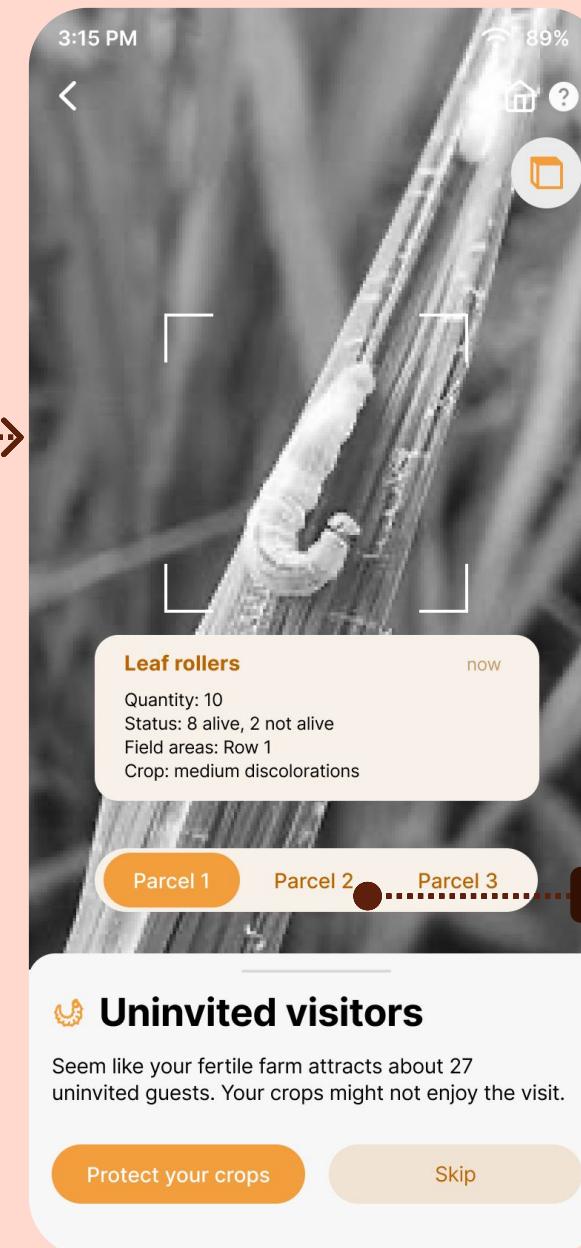


Insect treatment

Homescreen



Report screen (with insects)



The user will receive a notification about the detected insects. Tap on it to see details.

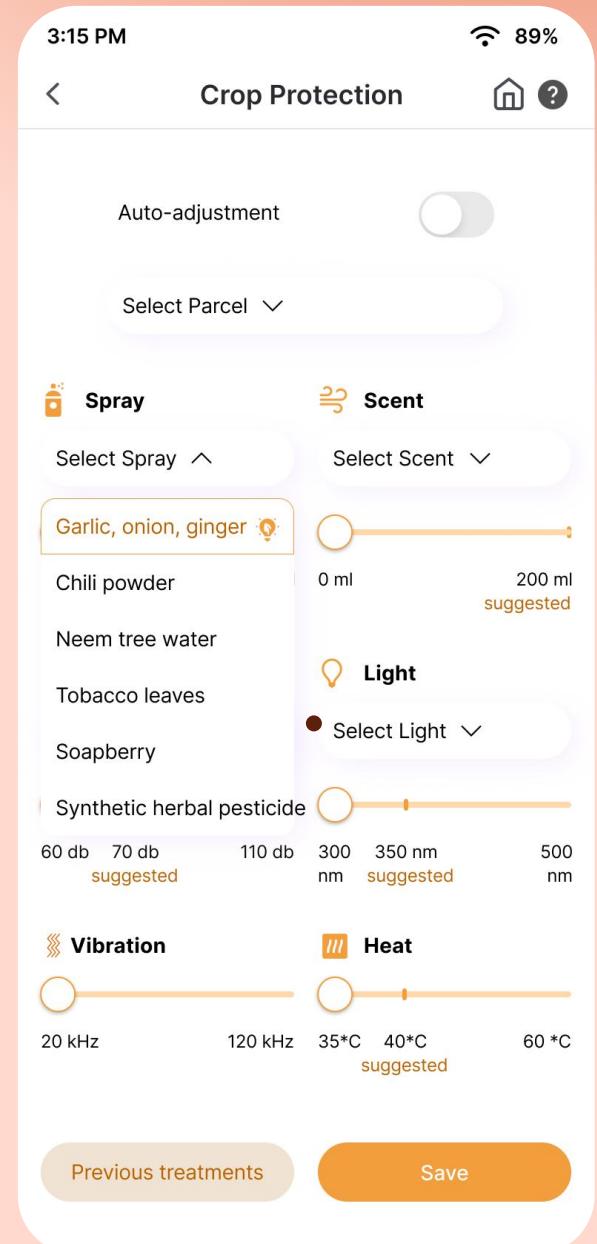
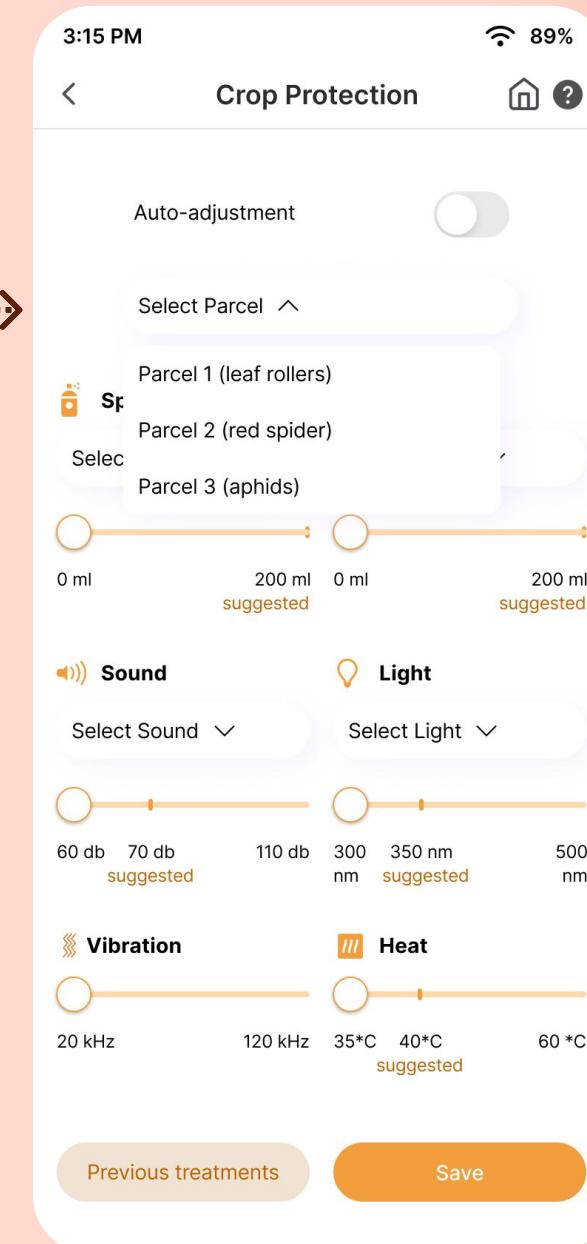
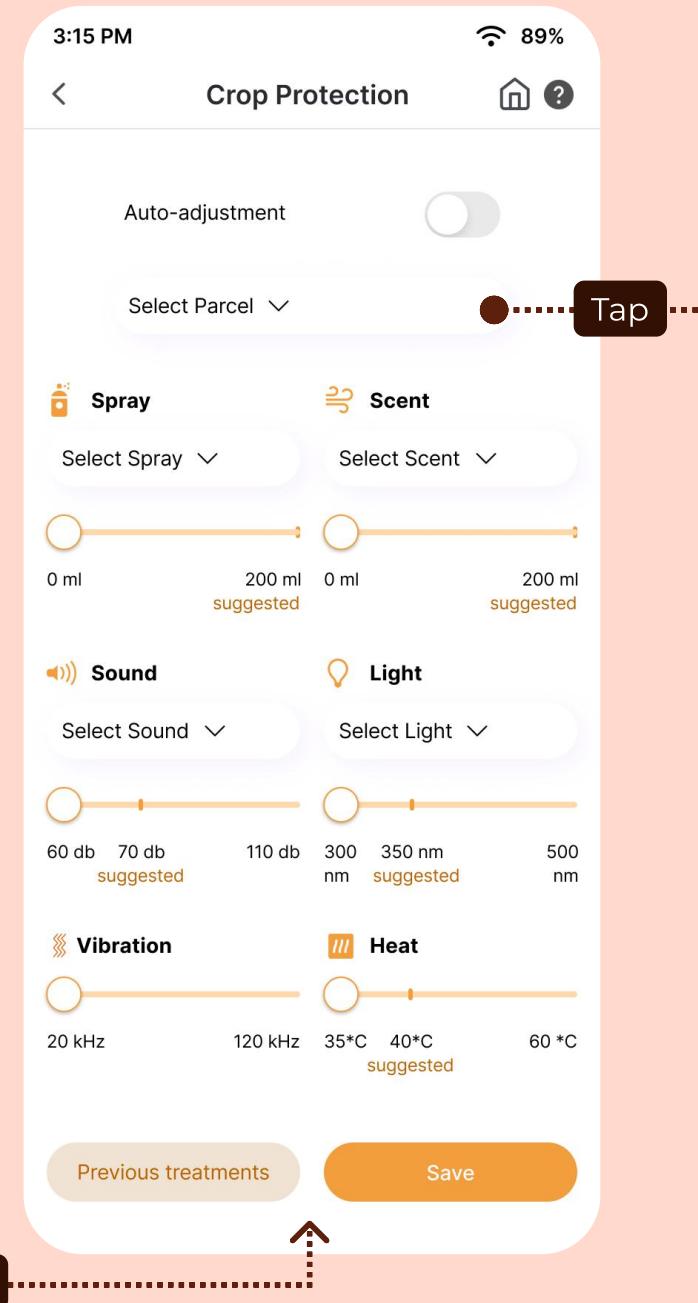
In this screen, the user can see all the insects information with real-time images. The user can switch between the Parcel by tapping on it.

Report screen (with insects)

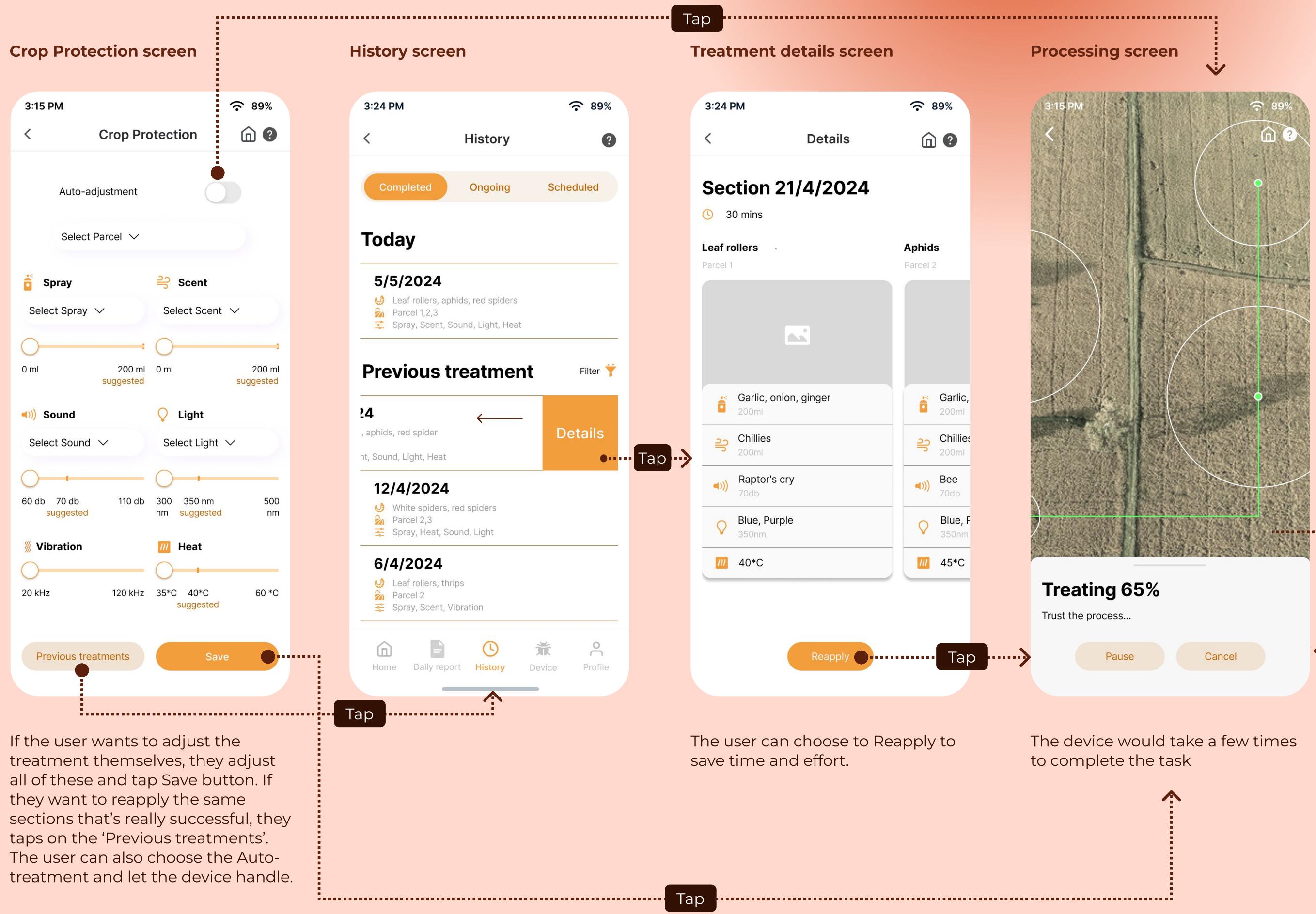


By tapping on the Switch view icon, the user can see the top-view RGB image of the farm with the damaged crops in red. The user then tap on the 'Protect your crops' to take timely actions. If choosing Skip, it will direct them to the Homepage.

Crop Protection screen



First, the farmer selects the Parcel and the treatment options from the drop-downs to treat, then adjust the quantity output. The app suggests which one to choose and how much they should go for.



*Please note that the Auto-treatment switch button in the Figma link isn't working sometime: please use cursor and choose the the Crop Protection frame to see.

Result screen (less successful)



After a while

Treatment completed

Great job. Most of the insects are gone.
Use Auto-treatment or schedule the treatment to ensure complete eradication.

Tap Auto-treatment

Schedule

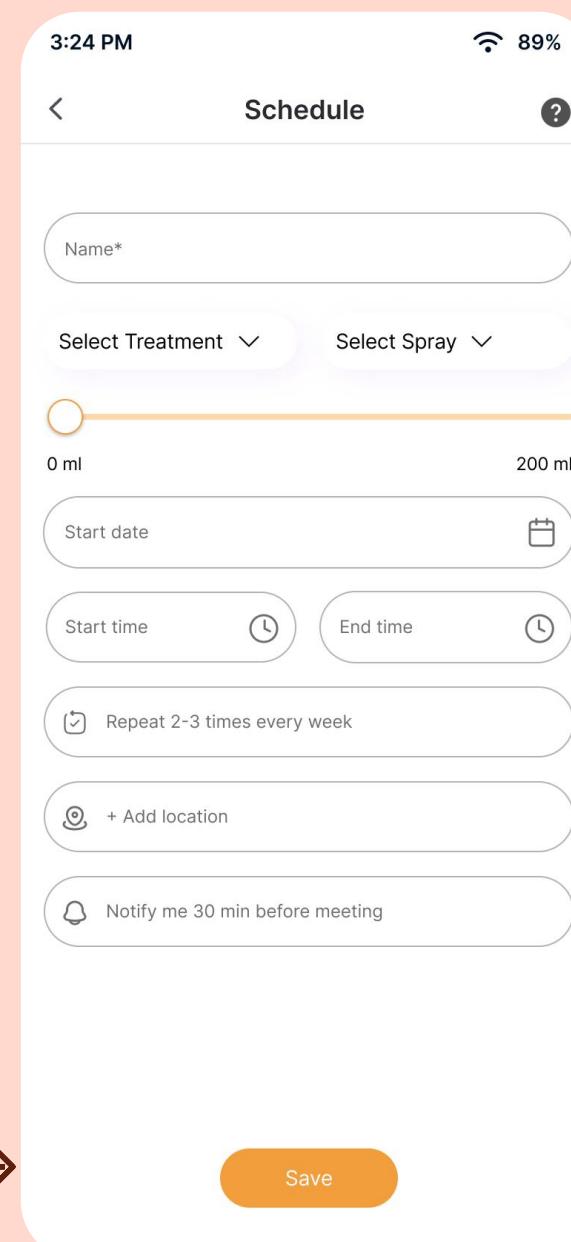
Tap

Save

If not all of the insects are gone, the app would give farmers suggestions:

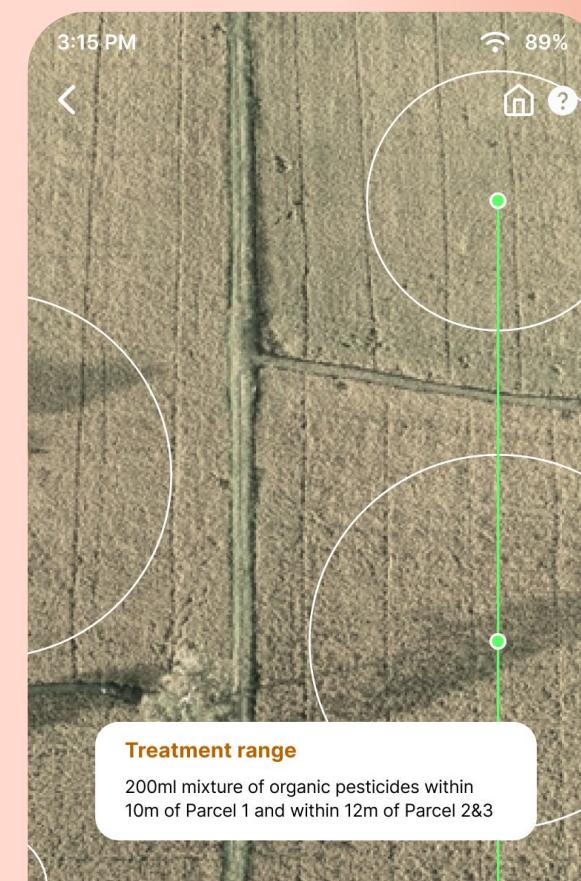
- If use 'Auto-treatment', it will lead back to the Processing screen.
- If choose to schedule, it will lead to the Schedule page.

Schedule screen



After putting in all of the details, the user taps on 'Save' button and move to the Scheduled treatment screen.

Result screen (really successful)



Your crops are protected

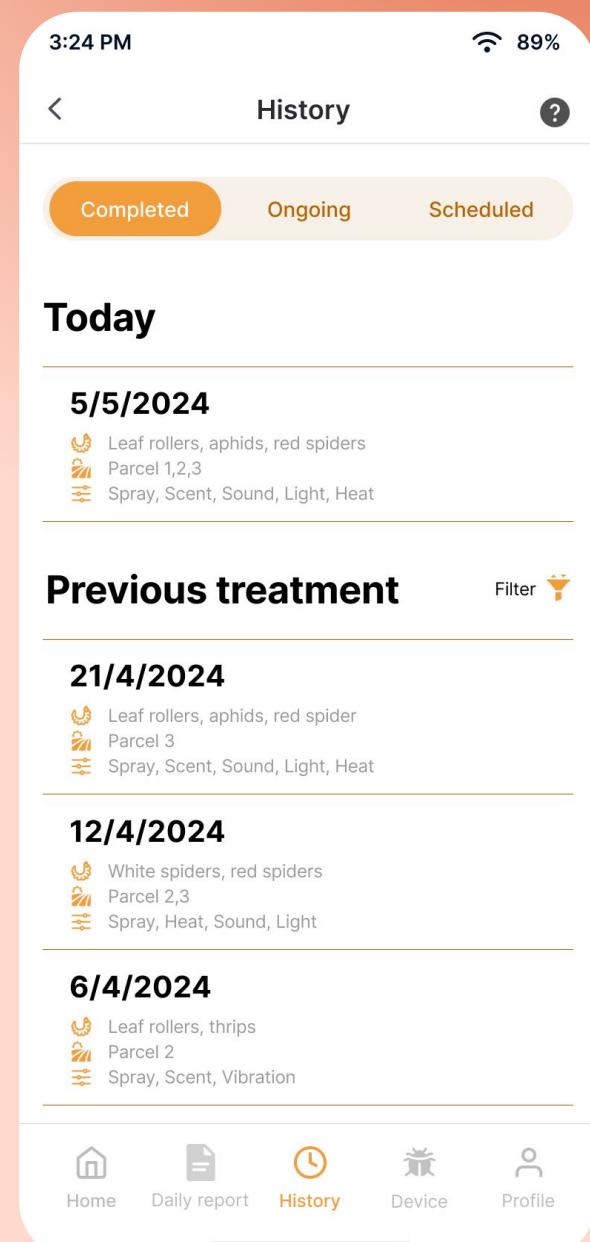
Excellent! There are no insects left for now.
Save this section's data for analysis to avoid the unwanted visit next time!

Save data

Don't save

If all insects are gone, the app will ask the user to save data. If save, it will lead to the History screen. Otherwise, it will lead to the Home screen.

History screen



Tap

Usability Testing

I explained my ideas and concept to the testers before the testing. They have no problem with the technology and how it works so this report mainly focus on the mid-fi prototype.

4 Tasks

I divided my mobile app to 4 small tasks and have 4 different reports for each tasks:

- Create an account**
- Find & open to see today report**
- Treat the insects effectively**
- Control the device using the app**

Task 1 - Create an account

Quantitative reports

| Quantitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Success rate | Complete success |
| Task time | 55s | 54s | 36s | 42s | 33s | 48s |
| Error rate | 1 | 2 | 2 | 2 | 1 | 3 |
| Satisfaction rate | 8/10 | 9.5/10 | 8.5/10 | 8/10 | 9.5/10 | 10/10 |

Qualitative reports

| Qualitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|----------------------------|---|--|--|--|---|---|
| Achieve the intended task? | Yes | Yes | Yes | Yes | Yes | Yes |
| Minor errors | <ul style="list-style-type: none"> Click on the input fields (not finished yet) Click on "Complete Profile" button before choosing location | <ul style="list-style-type: none"> Click on "Complete Profile" button before choosing location Click on "Sign In" button Click on the input fields (not finished yet) | <ul style="list-style-type: none"> Click on "Complete Profile" button before choosing location Click on "Sign In" button | <ul style="list-style-type: none"> Miss the click on "Sign Up" button (laggy) Click on "Complete Profile" button before choosing location click on the Tick button (not finished yet) | <ul style="list-style-type: none"> Click on "Complete Profile" button before choosing location Click on the input fields (not finished yet) | <ul style="list-style-type: none"> Click on the input fields (not finished yet) Click on "Complete Profile" button before choosing location |
| Major errors | | | | | | |
| Most challenging aspect | Too many steps: verify, choose your location. This might make the farmer annoyed and stop using the app | | | Too many steps: verify, choose your location. This might make the farmer annoyed and stop using the app | Placeholder text: confused why it's not in English | |
| Most rewarding aspect | Like the welcoming page, easy to navigate | Easy to understand | Easy to navigate | Straightforward, easy to navigate | Neat, clean, easy to scan | External Sign-up button (Facebook, Google, Apple) |
| What to improve | Simplify the steps, get rid of the Verify steps | | Highlight the "Choose your location" field when not chosen yet | | | |

Task 2 - Find & open to see today report

Quantitative reports

| Quantitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|---------------------|---------------------------|---------------------------|---------------------------|-----------|------------|---------------------------|
| Success rate | Success with minor issues | Success with minor issues | Success with minor issues | Failure | Failure | Success with minor issues |
| Task time | 24s | 14s | 29s | 1m21s | 48s | 33s |
| Error rate | 3 | 1 | 2 | 6 | 4 | 1 |
| Satisfaction rate | 6/10 | 9/10 | 6/10 | 5/10 | 6/10 | 7/10 |

Qualitative reports

| Qualitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|----------------------------|--|---|--|--|---|--|
| Achieve the intended task? | Yes, but need a little bit to figure out how to see Report details | Yes, but need a while to see Report details | Yes, but confused about how to navigate to the report screen at first | No without help | No without help | Yes, but need a while to see Report details |
| Minor errors | Go to Home first | | | | | |
| Major errors | <ul style="list-style-type: none"> Click on the report instead of swipe (multiple times) After knowing how to swipe, needs several times to successfully click on the Details button | <ul style="list-style-type: none"> Click on the report instead of swipe (multiple times) | <ul style="list-style-type: none"> Click on the report instead of swipe (multiple times) After knowing how to swipe, needs several times to successfully click on the Details button | <ul style="list-style-type: none"> Click on the report instead of swipe (multiple times) Navigate to different pages (Home, History, Device,..) and click randomly to find the report. | <ul style="list-style-type: none"> Click on the report instead of swipe (multiple times) Navigate to different pages and click randomly to find the report. | <ul style="list-style-type: none"> Click on the report instead of swipe (multiple times) |
| Most challenging aspect | Thinks that it would navigate to the Report Details page after clicking | Needs to swipe then click to navigate | <ul style="list-style-type: none"> Too many times clicking and it doesn't work, need to swipe Previous and Following Day button: Highlight only the "Previous Day" button would make user tend to click on that. | <ul style="list-style-type: none"> Took her too many times clicking and it doesn't work, need help Language's hard to understand. | <ul style="list-style-type: none"> Needs to swipe then click to navigate | <ul style="list-style-type: none"> It's unnecessary to swipe to click. It's just needed to be hide if it's Edit/Delete Language: What's the difference between "healthy crops" and "no insects"? |
| Most rewarding aspect | <ul style="list-style-type: none"> Details and clear, basic information Likes the Previous and Following day | Clear Dates, making it easier to navigate | User-friendly | <ul style="list-style-type: none"> Clear information, easy to scan easy to find the dates | Clear, overall information organization | Clear information |
| What to improve | Enable click to see reports | Enable click to see reports | Reduce the opacity of the insect information box | <ul style="list-style-type: none"> Would like to see the top view first to get an overall view Like to see the pictures, put the insects information into the bottom sheets | <ul style="list-style-type: none"> Enable click to see reports Push things up to see clearer (in the middle of the page) | <ul style="list-style-type: none"> It can swipe to edit/delete but click to see the reports Bigger today report Improve the content design (parcel, discolorations) |

Task 3 - Treat the insects effectively

Quantitative reports

| Quantitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|---------------------|------------------|------------------|--------------------------|--------------------------|------------------|------------------|
| Success rate | Complete success | Complete success | Success with minor issue | Success with major issue | Complete success | Complete success |
| Task time | 45s | 47s | 1m18s | 1m33s | 44s | 47s |
| Error rate | 2 | 1 | 3 | 4 | 0 | 1 |
| Satisfaction rate | 9/10 | 9/10 | 8/10 | 7/10 | 8/10 | 9/10 |

Qualitative reports

| Qualitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|----------------------------|--|--|--|--|---|---|
| Achieve the intended task? | Yes, understand how it works | Yes, understand how it works | Yes, but a little bit confusing | Yes, but click randomly to find the protection crop | Yes | Yes |
| Minor errors | <ul style="list-style-type: none"> • Laggy at the Auto-treatment • Swipe the Crop protection bottom sheet (not swipable yet) • Click, zoom in&out of the focus icon | <ul style="list-style-type: none"> • Cannot use the slider (laggy - not dragable in mobile) • Try to zoom in&out of the images | <ul style="list-style-type: none"> • Some buttons do not work (not functional yet) • After seeing Previous treatments - get confused then go back to the crop protection page because he doesn't know he can reapply • Try to zoom in&out of the images • Swipe the Crop protection bottom sheet | | <ul style="list-style-type: none"> • Some buttons do not work (not functional yet) | <ul style="list-style-type: none"> • Some buttons do not work (not functional yet) • Try to zoom in&out of the images |
| Major errors | | | | Struggle to find the way back to the report screen after returning to the Daily report screen -> click randomly and navigate to other pages to find the crop protection page | | |
| Most challenging aspect | | Not understand much about what schedule do | Confused about the difference between Schedule & Auto-treatment; and why do they need another one right away? | Unable to find to protect the crops | Unfunctional buttons | Auto-treatment and schedule together makes people confused |
| Most rewarding aspect | Clear, easy to know what to do next | Easy to understand | Has a processing image | Clear information about quantity output | Easy to understand | Has reapply, suggestions, Ongoing & Schedule pages |
| What to improve | Can rename/ customize the field name (Report screen) | | <ul style="list-style-type: none"> • Highlight the insect numbers & Auto-treatment; notify about treatment overuse • Auto-save • Processing image: add radiating circles - looks like it's spraying... | A button to navigate directly to the crop protection | Rewording: "Treatment completed" if not fully treated the insects | |

Task 4 - Control the device using the app

Quantitative reports

| Quantitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Success rate | Complete success |
| Task time | 3s | 2s | 3s | 5s | 3s | 6s |
| Error rate | 0 | 0 | 0 | 0 | 0 | 0 |
| Satisfaction rate | 8/10 | 8.5/10 | 7/10 | 8/10 | 10/10 | 6/10 |

Qualitative reports

| Qualitative report | Phuong (20) | Linh (21) | Truc (18) | Thuy (21) | Chanh (20) | Hanh (21) |
|----------------------------|---|--|---|--|--|--|
| Achieve the intended task? | Yes | Yes | Yes | Yes | Yes | Yes |
| Minor errors | | | | | | |
| Major errors | | | | | | |
| Most challenging aspect | Too many steps: verify, choose your location. This might make the farmer annoyed and stop using the app | | Two buttons with the same function: "Start-flying" & Device in the navigation bar | <ul style="list-style-type: none"> Small control buttons Lack of processing percentage | | <ul style="list-style-type: none"> Location map's not necessary |
| Most rewarding aspect | Clear information | Easy to navigate | Easy to understand | Easy to navigate & informative | Neat, clean, easy to scan | External Sign-up button (Facebook, Google, Apple) |
| What to improve | Bigger control buttons, bigger control panel | Bigger control buttons, bigger flying camera | Click to see full-screen active & control device | <ul style="list-style-type: none"> Bigger control buttons, bigger flying camera Put the spray input in the top bar | <ul style="list-style-type: none"> Turn the buttons for Move into a dragable circle | <ul style="list-style-type: none"> Turn the buttons for Move into a dragable circle |

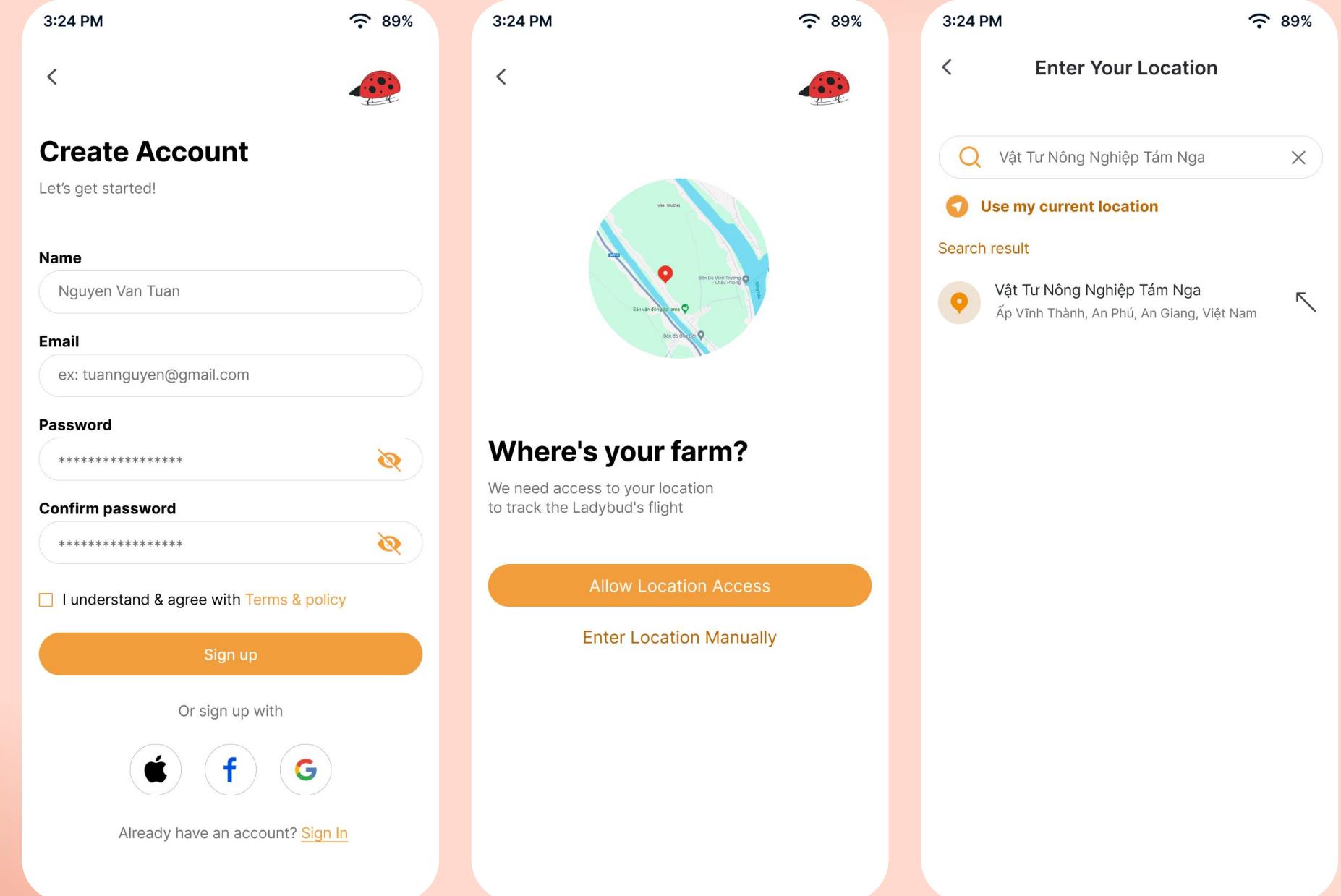
Analysis

I analyze what works and doesn't work with my mid-fi prototype based on the user testing and my own observation.

Onboarding

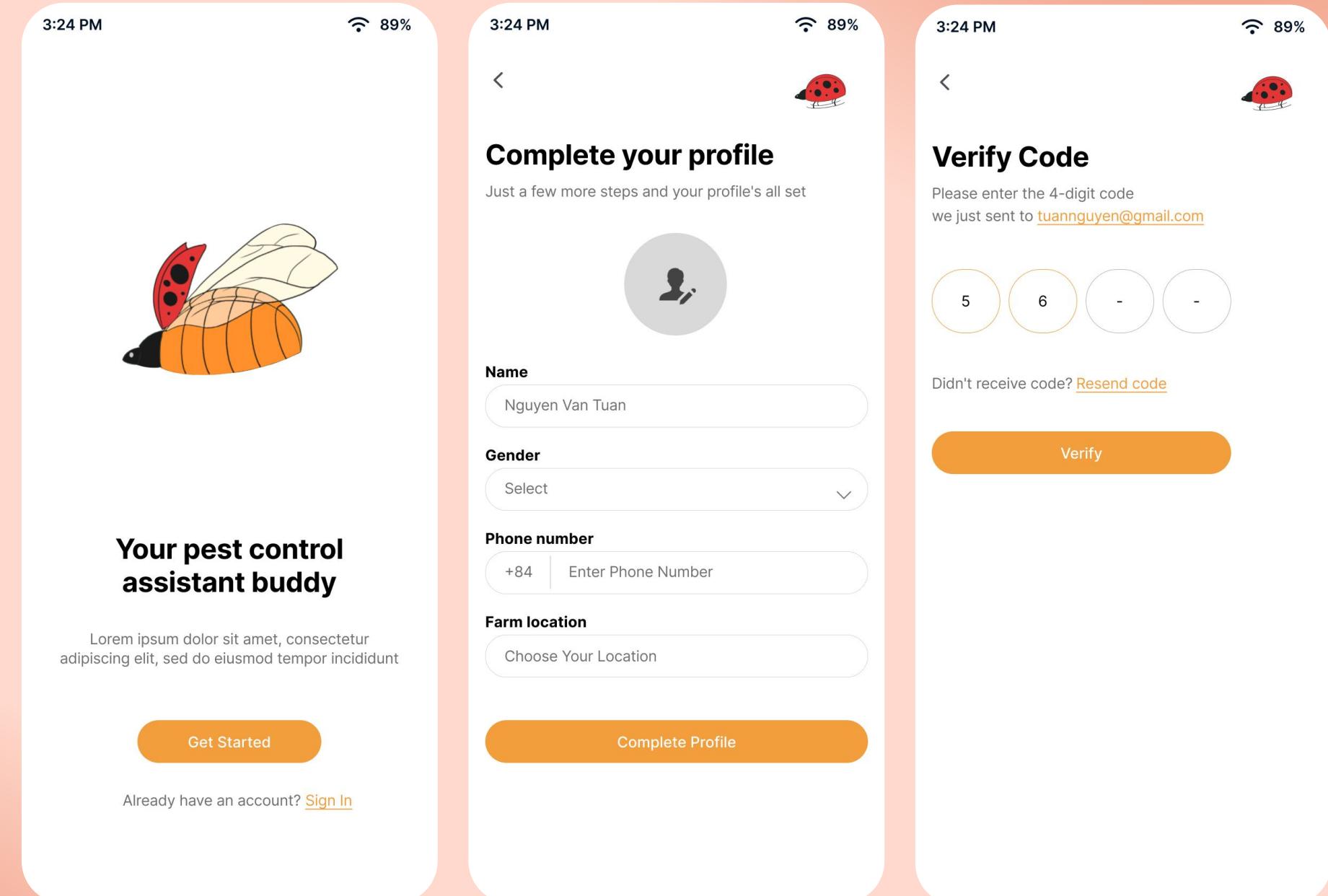
What works

- Some really like the onboarding screens that showcases the device
- The CTA button has consistency in shapes and colors so it makes it easier for the users to know where to click
- Steps are pretty the same as other existing onboarding screens: pretty straightforward, neat, and easy to navigate
- Sign up with other applications : Facebook, Apple, Google
- Choosing location is fast and convenient: Allow user to choose the location automatically, making it easier and faster for the users



What doesn't work

- Lack of hierarchy: There's so much space within the welcome screen
- Language need to be more simple & friendly
- Everyone doesn't know that they need to choose their location before clicking the "Complete Profile" button, because of the button are in the active state and "Choose your location" are not highlighted
- The buttons are not in the similar area, which makes the user to move their fingers quite a lot to navigate. For example, "Get started" and "Complete Profile" are inconsistent in terms of the button's positions.



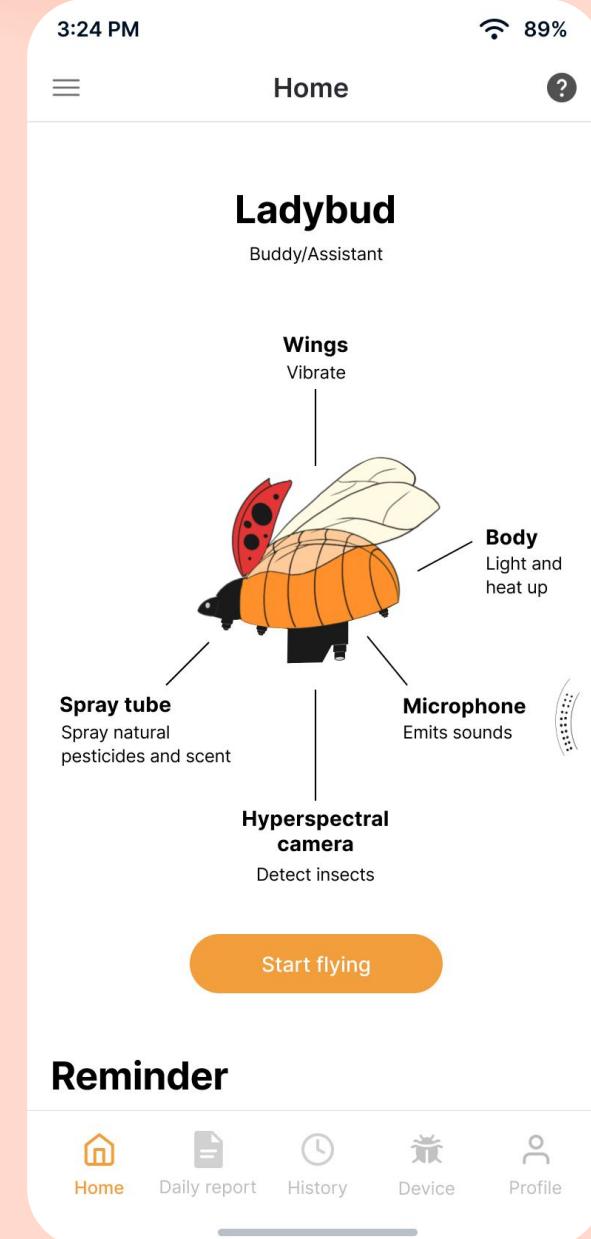
Home

What works

- Users can see the device breakdown and know each part's function
- Hinting to the vertical scroll to the Reminder, most of the testers know this & scroll
- Neutral colors & icons are making it easier to see things clearer and understand the context
- Most people don't have the problem with this page

What doesn't work

- The device breakdown is taking all of the space of the Home page, there are a lot of information to display and for user to digest
- The diagonal line to annotations to all the functions are not quite aligned, neat and consistent
- Typography is easy to read but not really speaks to the farmer and the ladybug
- Icons: not consistent - a mix of fill and outlined
- One tester thinks that the "Start flying" and "Device" button in the navigation bar is having the same purpose, it's not necessary to have both



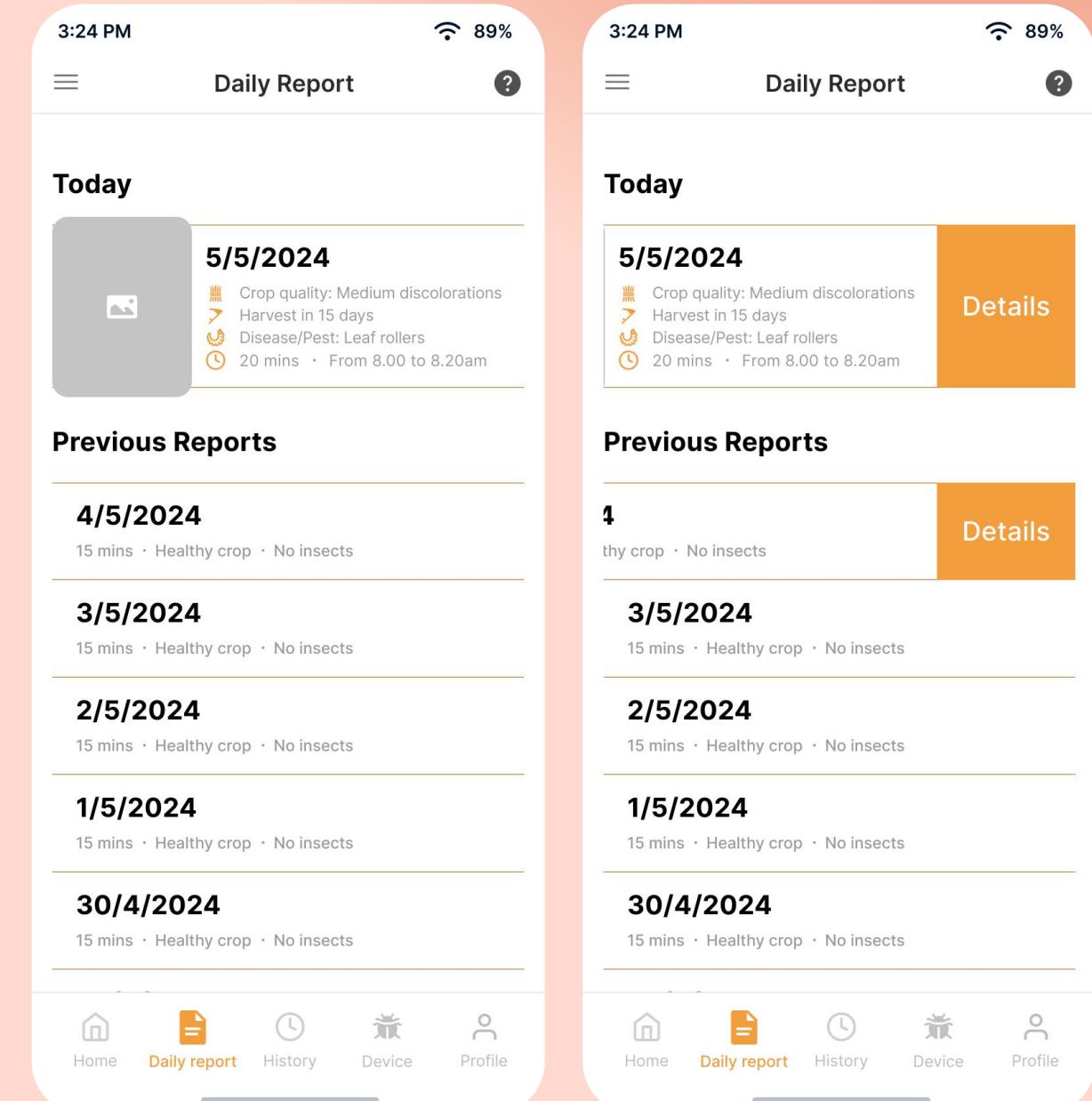
Daily report

What works

- Clear & basic information (dates, crop quality, minutes,...) sorted by dates & icons, making it easier to scan
- Easy to navigate to this page using the navigation bar
- Separating Today report and Previous days report

What doesn't work

- Hidden "Details" button: they need to swipe to the left to see the button. Only then they're able to see the Report details
- The swipe like this is only for Edit/Delete function to avoid the user not to slip on it and make mistakes
- Every users don't know to swipe to see at the first time, causing confusion that they'll be come looking for a way to see the report. Some navigate to other pages (Home, Device, History...). Everyone clicks on the report multiple times, sometimes randomly, to see the reports instead of swiping and clicking. Most takes a while to understand to swipe, some fail to find a way to see. Most of them need to swipe several times to click on the "Details" button.
- Lack of date filter
- Today report's not really pop-up and might be lost in the previous reports



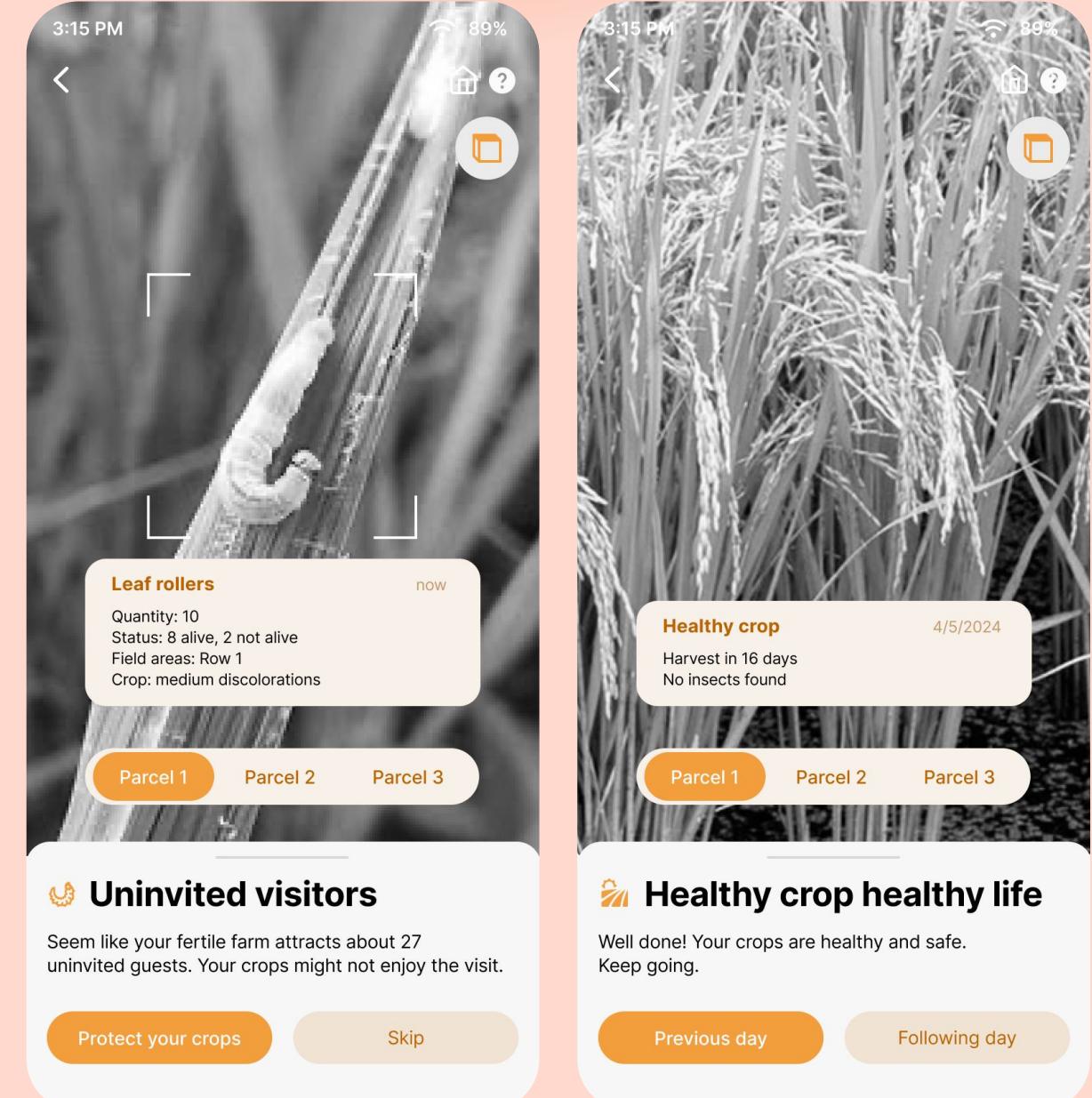
Report details

What works

- Clear information
- Easy to switch between parcels
- Appealing CTA buttons
- Consistent
- Able to switch view
- Previous and Following day: makes it more convenient to navigate through different reports

What doesn't work

- Previous and Following Day is in different colors, making user to lean more on the Previous Day
- The containment with the insect/crop information is covering the images
- The switch view button is not really clear, most people ignore that
- The buttons are pretty low (screen bottom) to click on
- Language's causing confusing "Parcel" & "Discolorations" - most people don't know these words
- Back, Home, Help button is lost within the images
- Focus icon is not necessary, some users mistook it as clickable
- Body text's quite small
- Insects quantity are lost and easy to be missed
- Bottom sheets are quite small and not really catchy



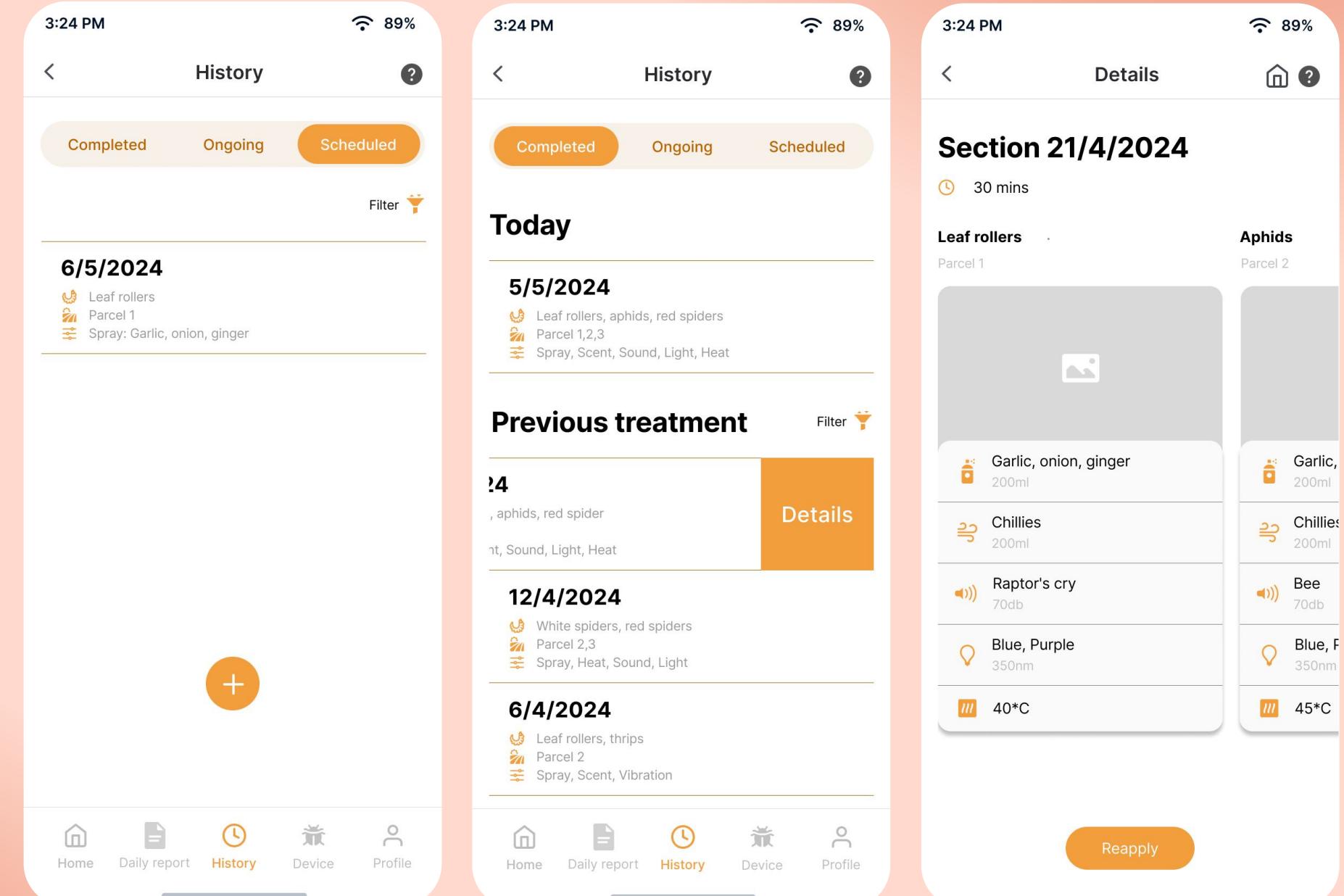
History

What works

- Divided into Completed, Ongoing & Schedule section
- Separating Today and Previous day section
- Date filter so it's easier to search for a section to reapply
- Icons with clear information
- Add schedule button in the most convenient area

What doesn't work

- Same problem with Daily report: swipe to see.
- For first time users, they cannot know to swipe to see the previous sections to hit the reapply button. - Some get confused about going to the previous treatment, not knowing that they can see the treatment to reapply



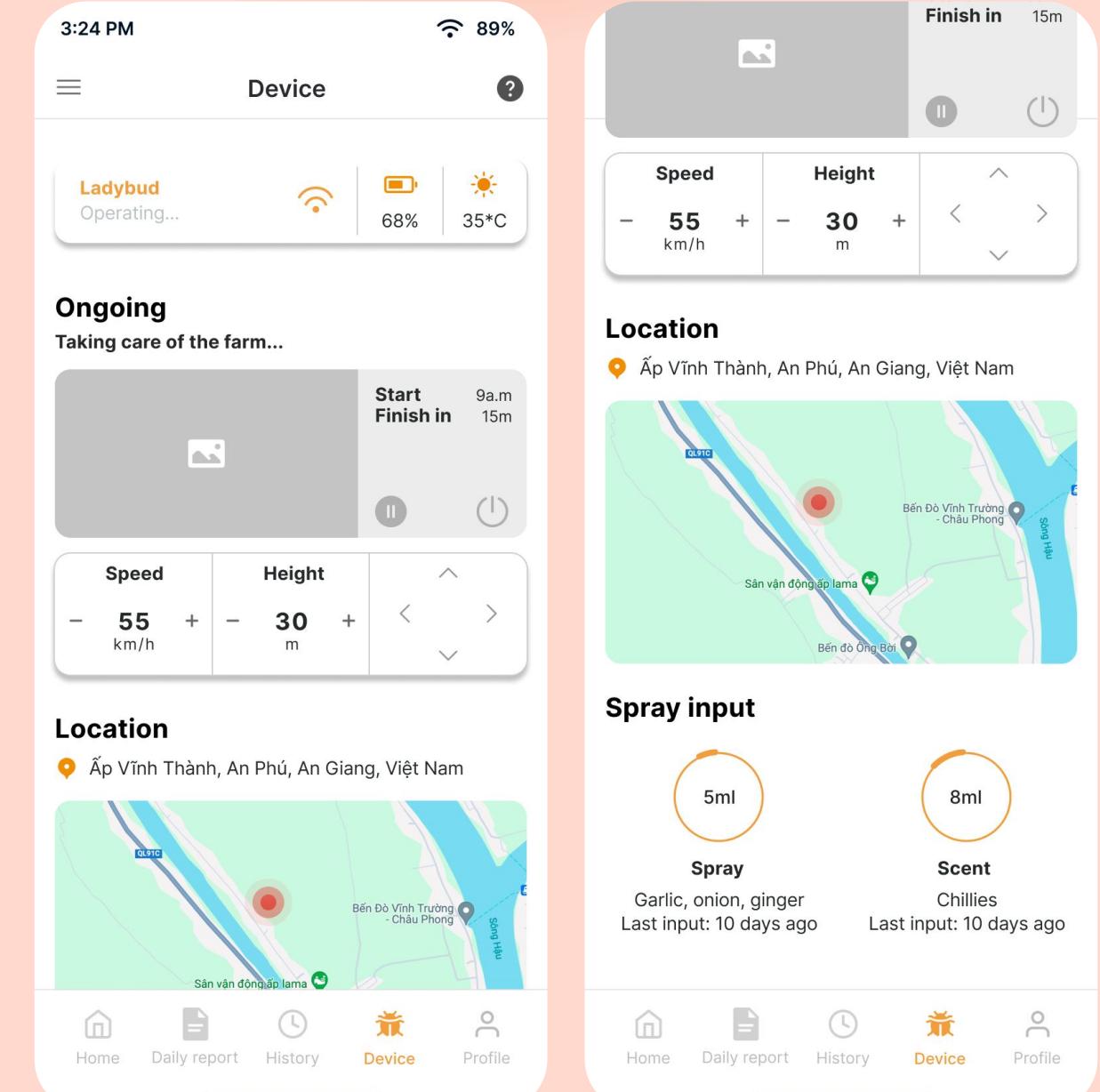
Device

What works

- Clear to see, easy to use
- Informative top bar: battery, wifi, weather

What doesn't work

- If they want to check Spray input from the Homepage's reminder, they need to scroll to see. This is not really convenient
- The control button's small so that it's hidden behind the user's fingers
- Device camera's small and Lack of device process : if they control within the app, it would be really annoying and unclear how the device are moving, especially for farmers
- Location map's big and unnecessary
- The start & finish time might be ignored since it's really small



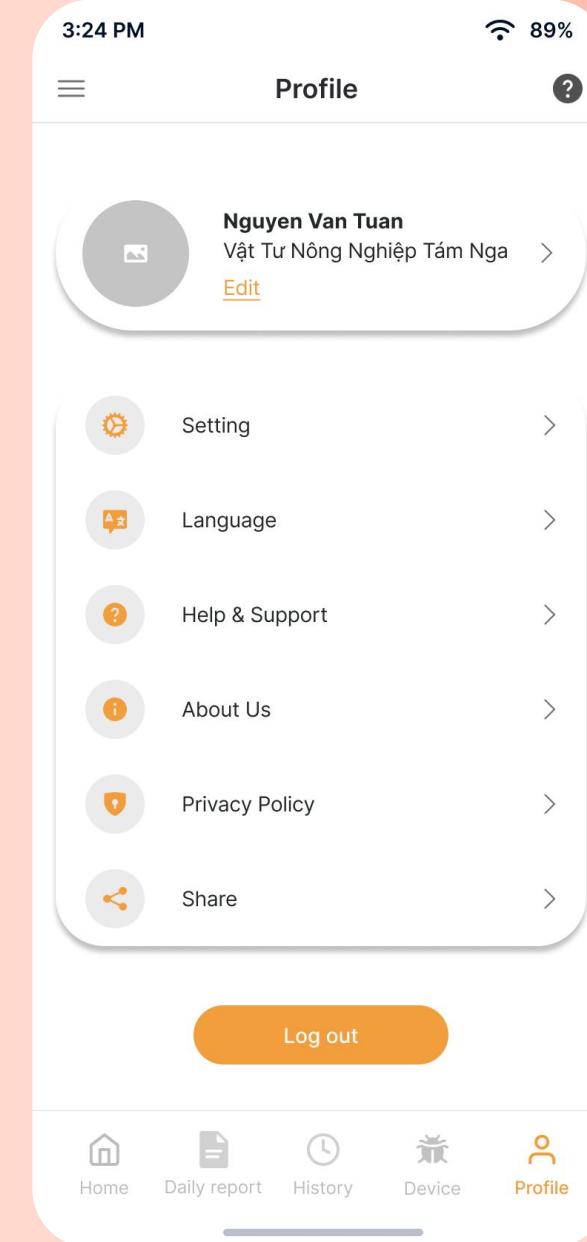
Profile

What works

- Clear & simple
- Consistent fill icons (within the page)
- Most users don't have a problem with this screen

What doesn't work

- Don't need a circle around the icons. This is inconsistent with other icons that don't have a circle
- Log out button's calling for people to log out



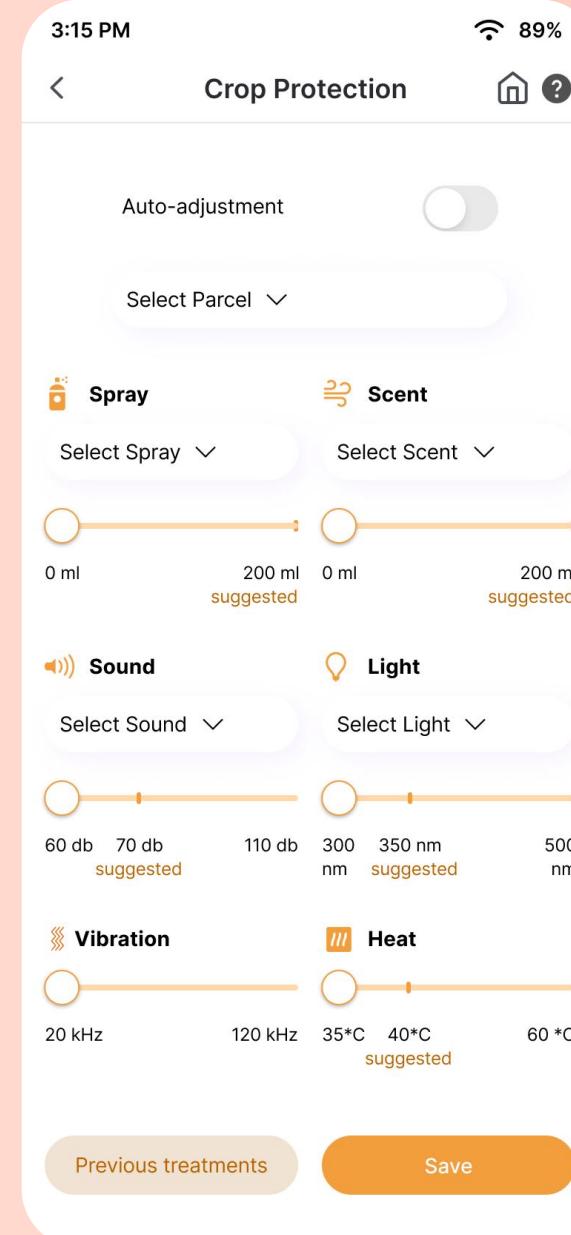
Crop Protection

What works

- Previous treatments allowing users to reapply the previous sections that's effective and not waste time
- There are suggestions that help users how much they should go for
- Icons make it easier to understand different functions/treatment
- Auto-treatment: easier and faster to treat insects
- Most testers understand the function of each button

What doesn't work

- Heavy layout, most users pass and click on Auto-treatment or Save button
- Short sliders
- Suggestions are not popping up -> may cause confusion of how much should they take
- Auto-treatment's not popping-up
- Inconsistency between the fill & outline icons
- Two testers get confused after clicking the "Previous treatments" and it leads to the History page, then go back to this page



Processing

What works

- Pause & Cancel
- Has real-time processing image



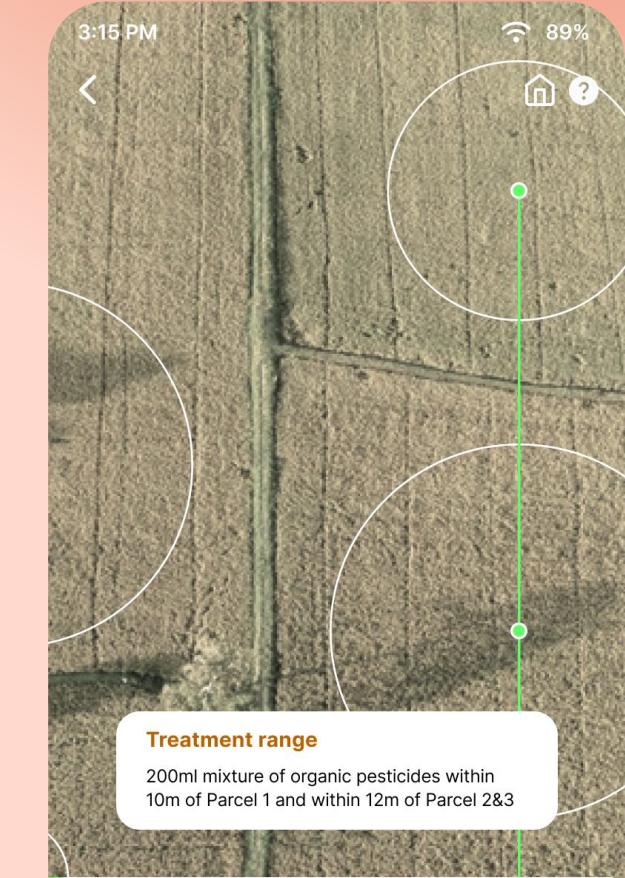
What doesn't work

- Small containment and lack of treatment and in progress icon (%): it might be unclear to the farmer how the device's working
- Confusing processing image visual: lack of visual prompt so the user's not really sure what's happening with the image

Result

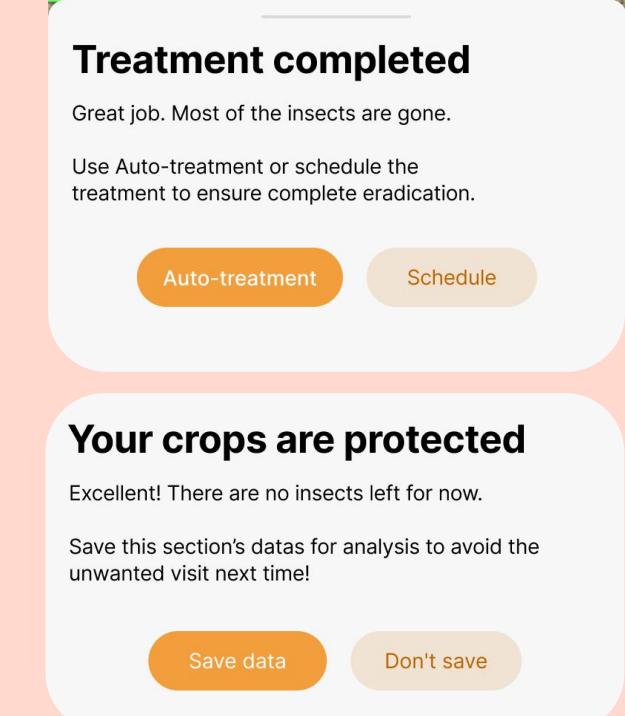
What works

- Give suggestions and CTA button so the user know what to do next
- A real-time map so the user know what happened and can check easily
- Basic information about the quantity output



What doesn't work

- Content design's confusing: "Treatment completed" makes user think the insects are all gone when it's not
- Schedule + Auto: Some get confused between the Auto-treatment & Schedule. They don't know what's the difference, because of the wording & language
- Another treatment right after completing a section: not necessary - it might hurt the crop because of overusing treatment
- Language "eradication" - might cause confusion because most people don't know this word
- Lack of 'Save data' for the one that's not fully treated.



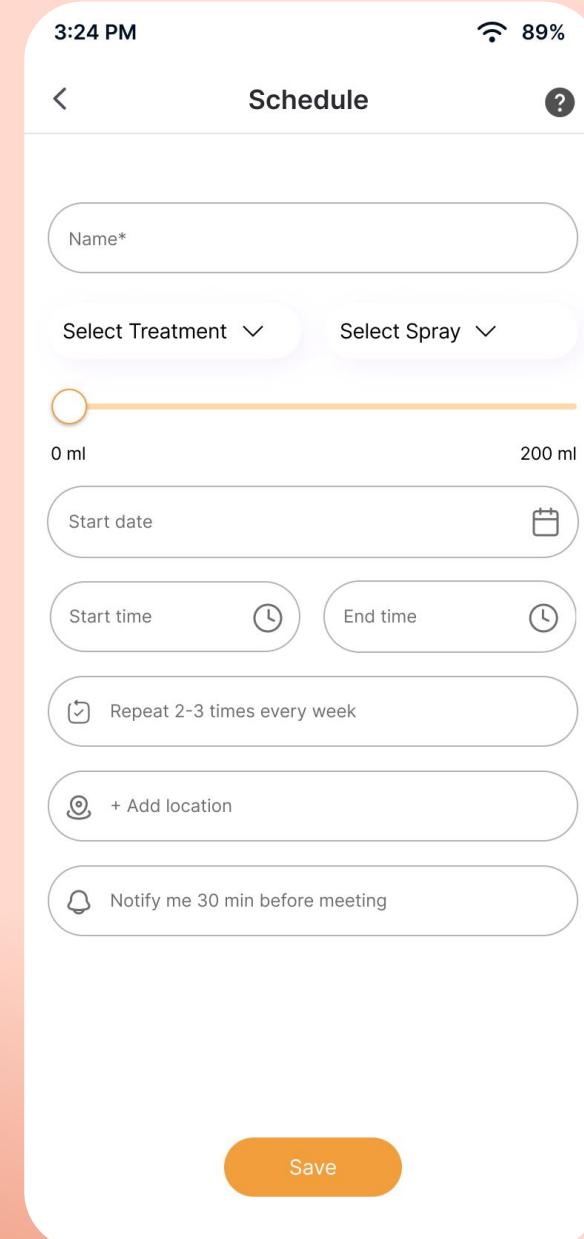
Schedule

What works

- Basic information
- Allow to repeat
- Consistent outline icons (within the page)

What doesn't work

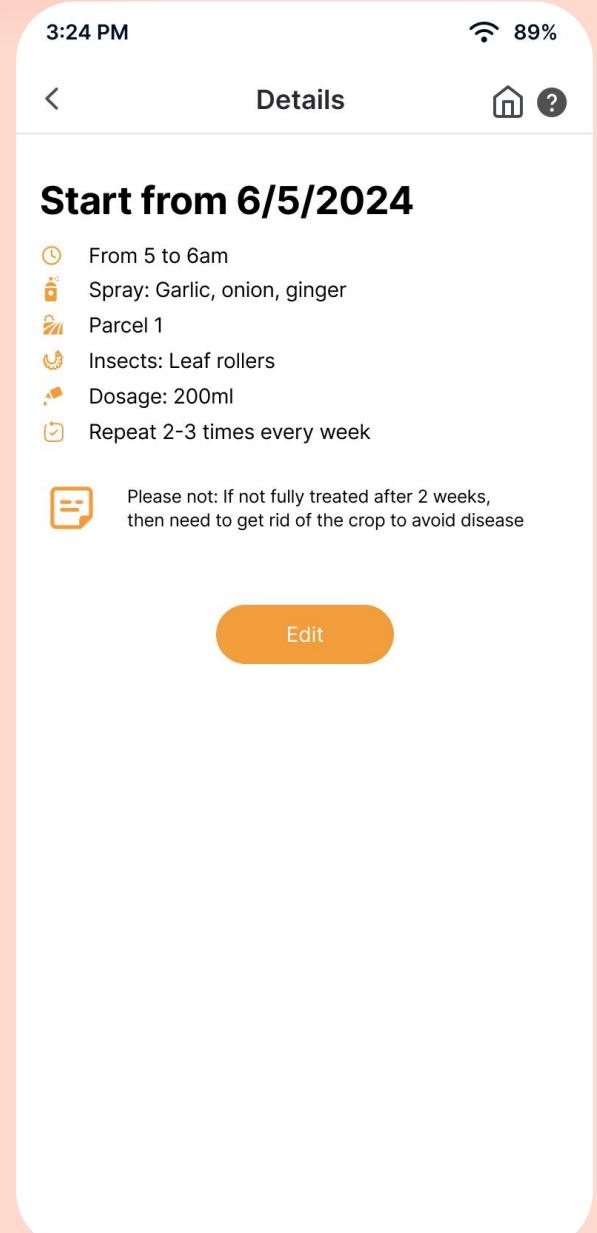
- Lack of design & visual



Schedule screen

What works

- Clear bullet points + icons
- Able to Edit
- Reuse the icons



What doesn't work

- Inconsistent layout with the Completed details
- Lack of design & visual

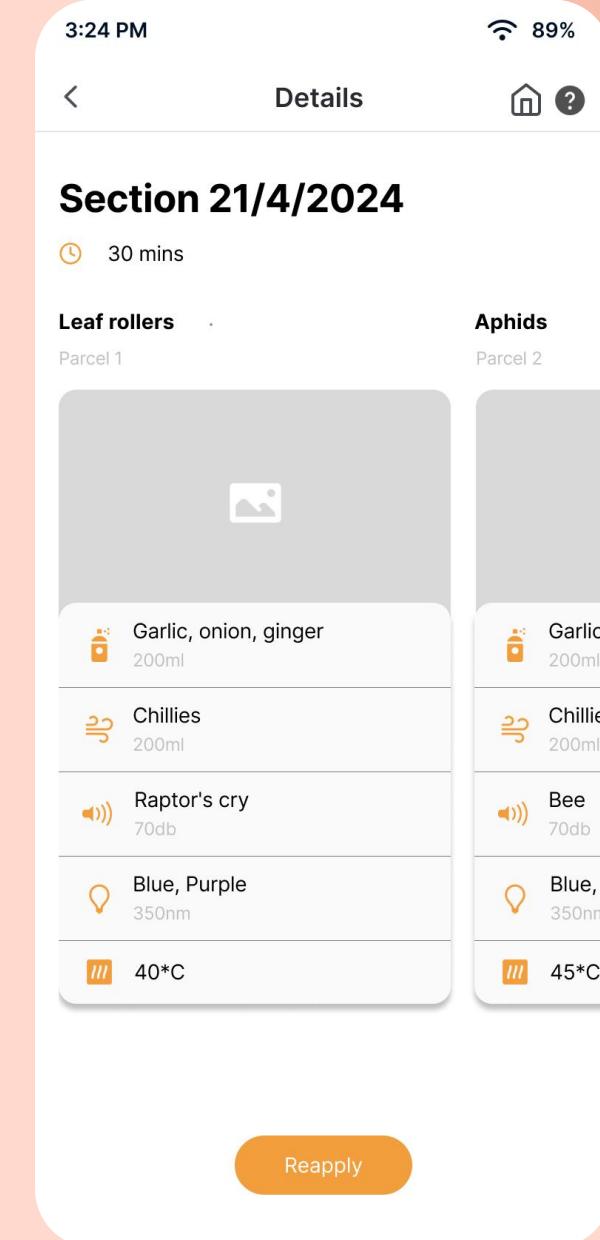
History details

What works

- Iconography: icons reused; time with icon
- Reapply treatment: users don't have to think too much about which treatment and how much should they give
- Clear to see: treatment are divided into sections, designed in one containment, with each insect's icons; carousel with clear hint

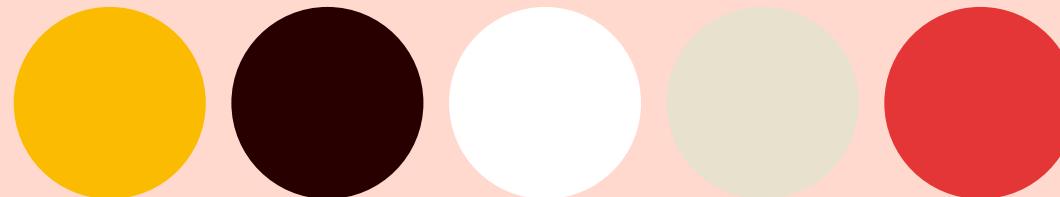
What doesn't work

- Lack of consistency with other pages, this is a lil bit different



Design system

Color



I incorporate a friendly color scheme that's inspired by ladybug's color. I don't use red in my interface a lot, only in the mascot's wings. I want it to remain neutral and have a good contrast so that it's easy to read and navigate through the information.

Typography

Aa

Be Vietnam Pro

Regular

Medium

Bold

To strengthen the friendly and buddy look-n-feel of Ladybud, I use a sans-serif typeface that's round and geometric. This is clear and simple enough to read.

Iconography

I decided to go with filled icons. All are in the same size (24*24), with rounded corners. This iconography would help the users a lot in understanding the device function and design context.



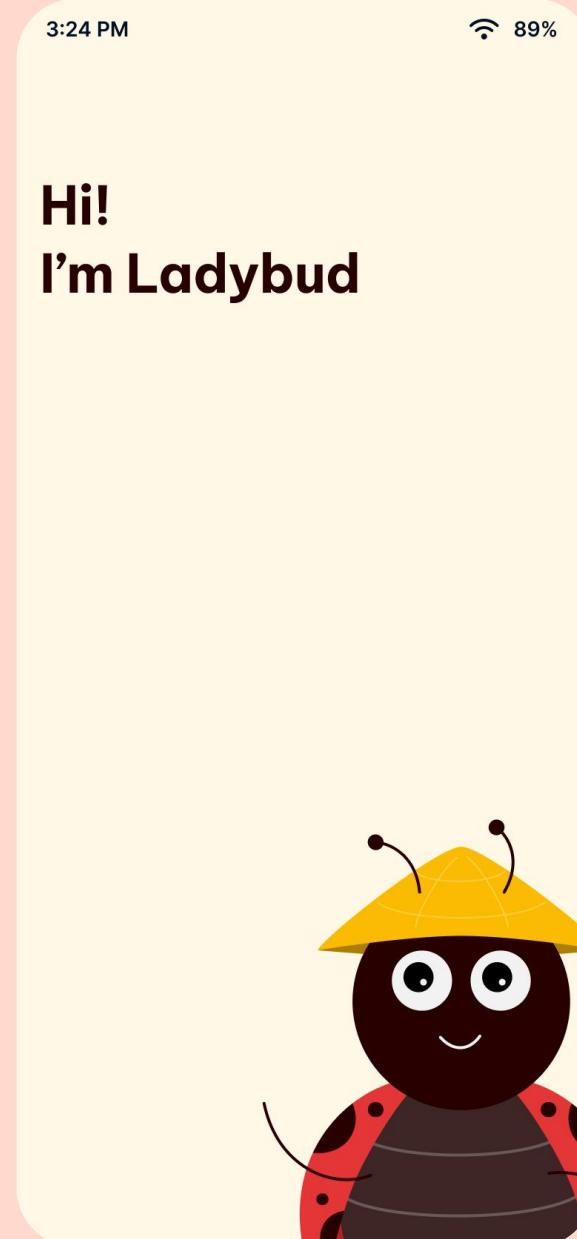
Mascot design

Since the device's in the form of a ladybug, I want to have a supportive and friendly ladybug within the app to support the farmers whenever they need help. This strengthens a relationship with the farmers and the ladybug becomes their buddy. To further reinforce this, this ladybug has "nón lá" that stands for Vietnamese, incorporating farmers' culture into the mascot.



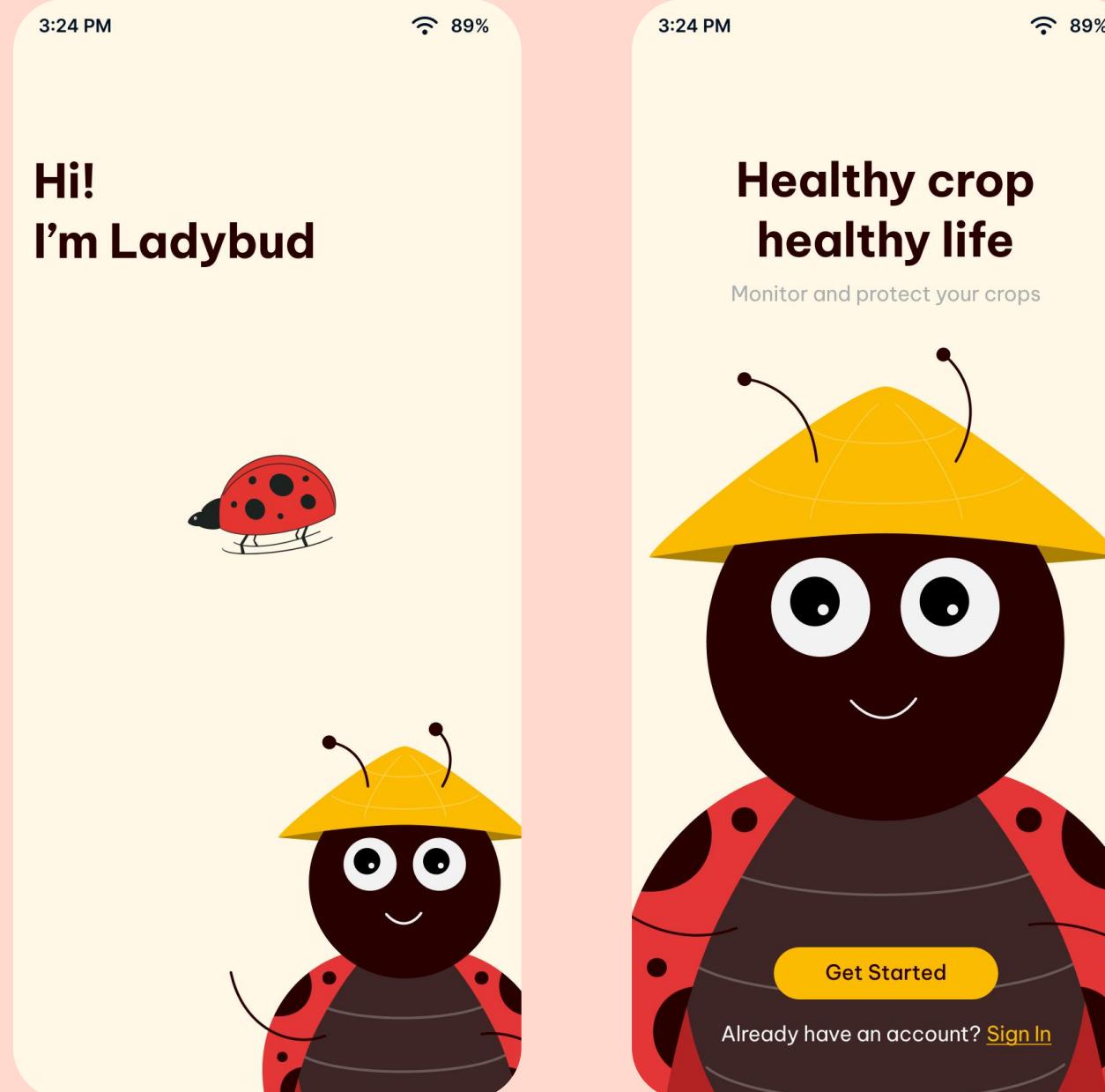
High-fi prototype

Welcome screen



Welcome screen is changed from a single ladybug to the mascot saying Hi! to have a more friendly entrance with the device flying in.

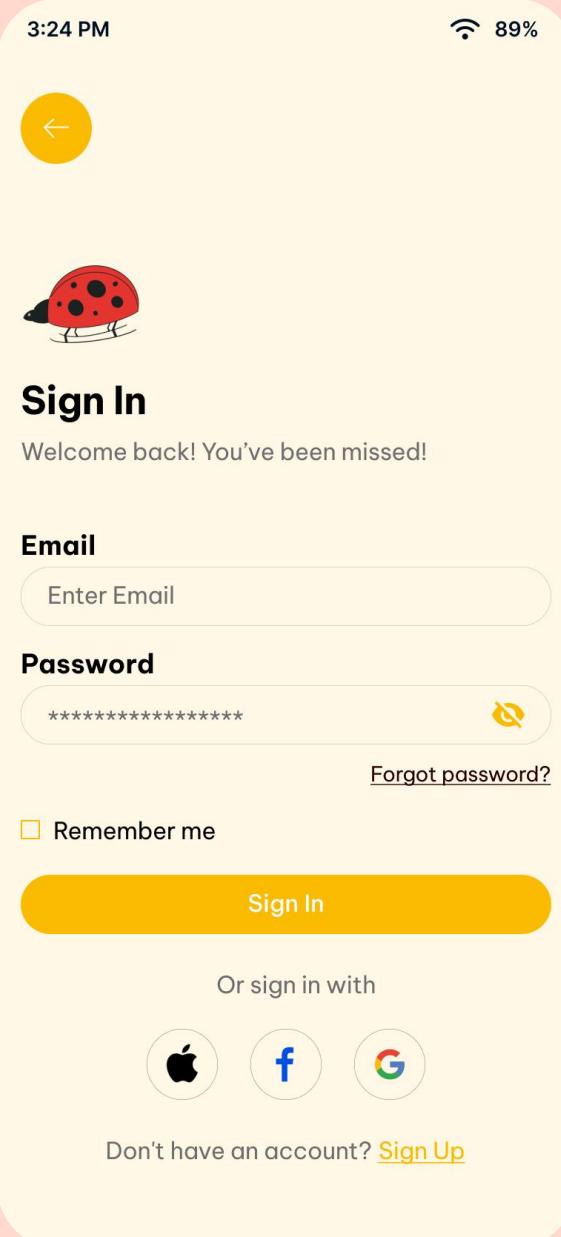
Onboarding screen



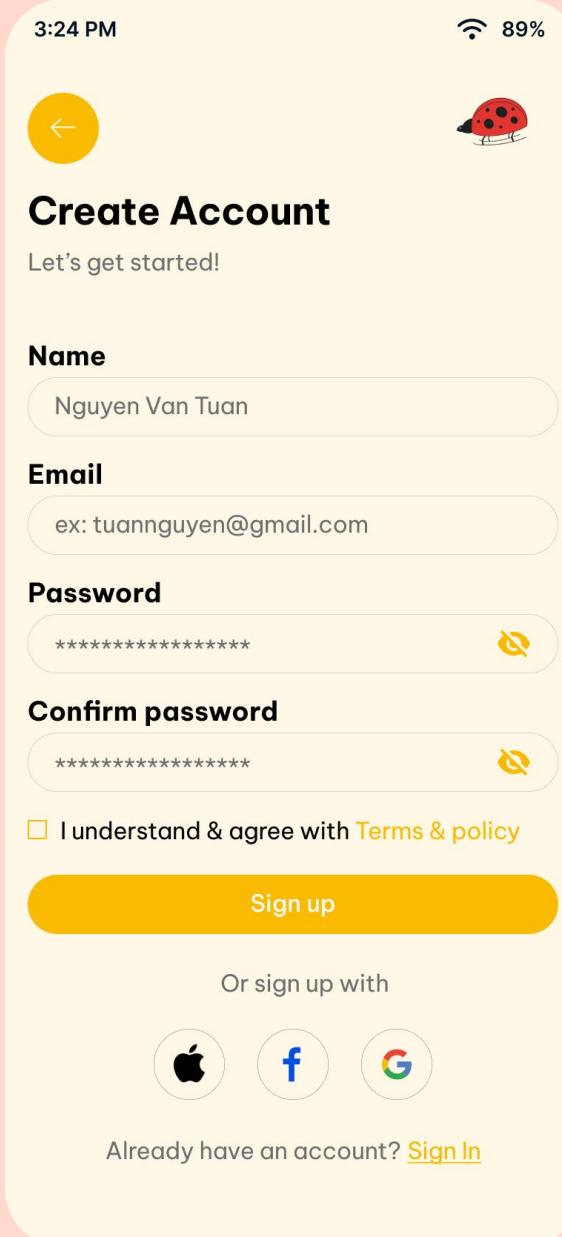
The welcome message has gotten clearer, focusing on what the user'd get by using the products. It also shows what it does straightforwardly: "Monitor and protect your crops." The space and hierarchy here also got a lot better.

Onboarding

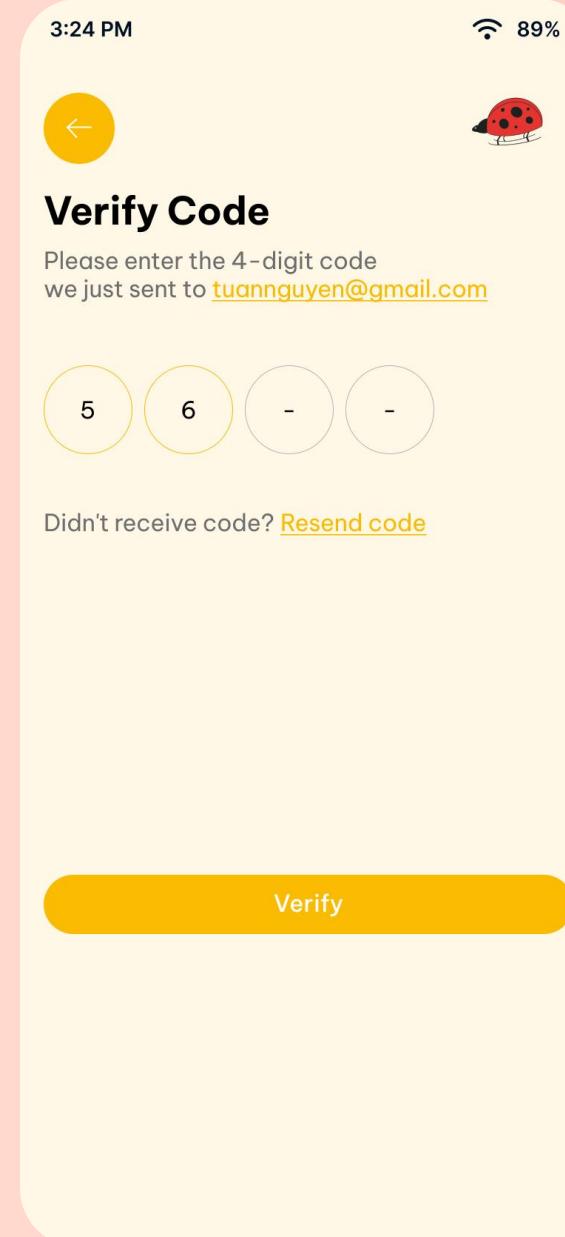
Sign In screen



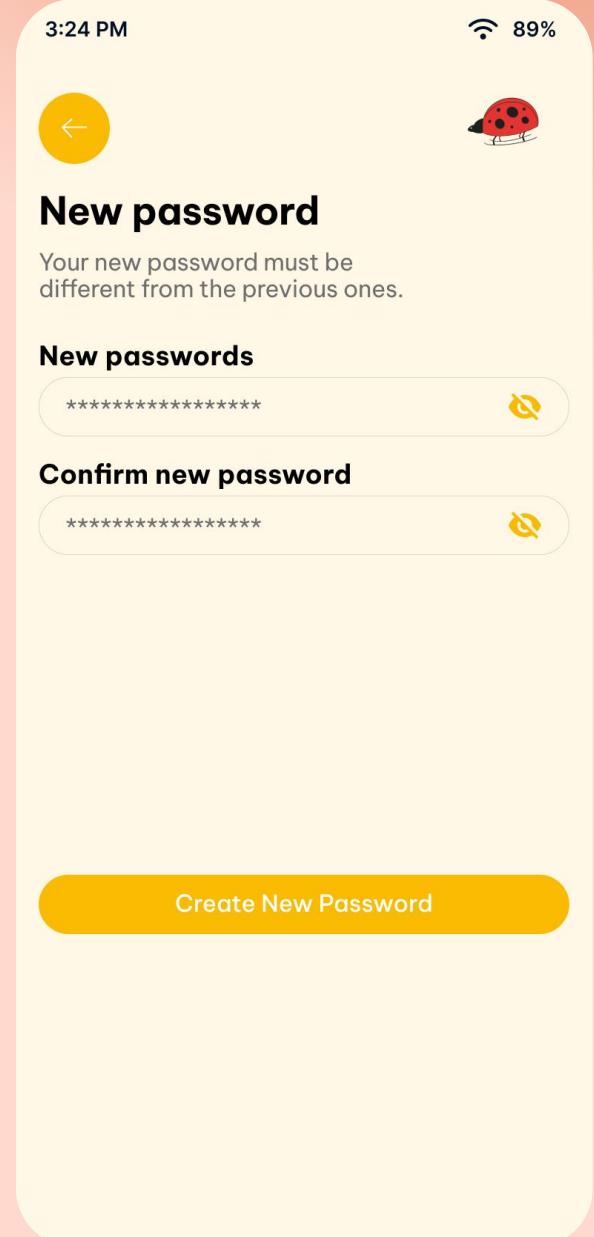
Create Account screen



Verify Code screen

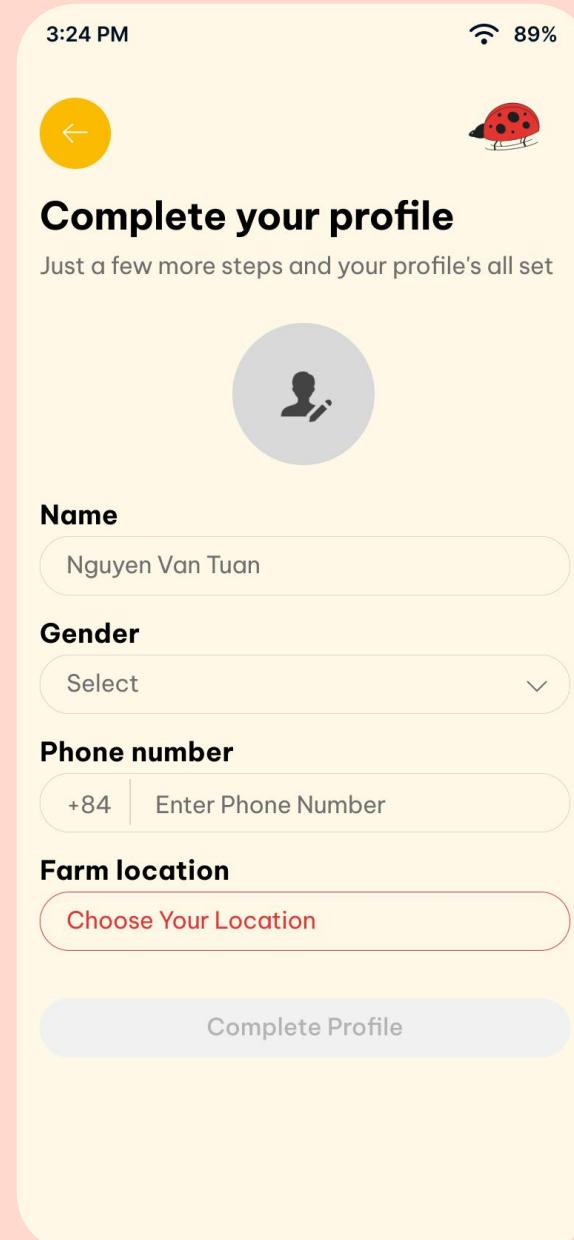


New password

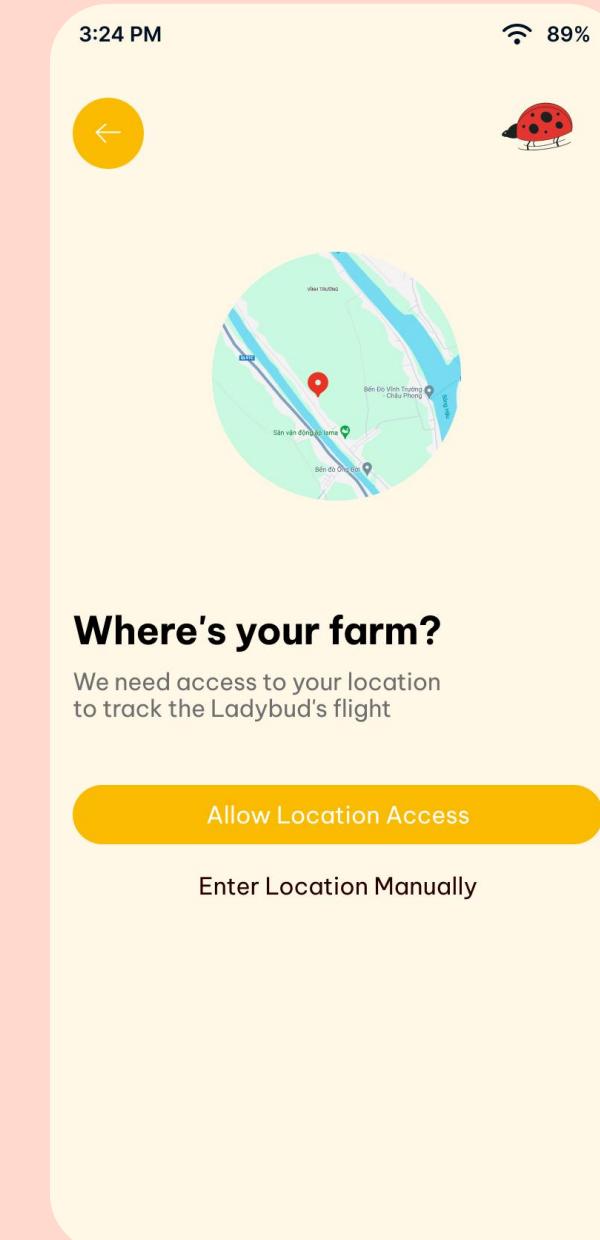


These screens don't change much, just a little bit to be consistent with the new visual style: change in background color, Back button. Also, changes in button's position to be in similar area so it's more user-friendly.

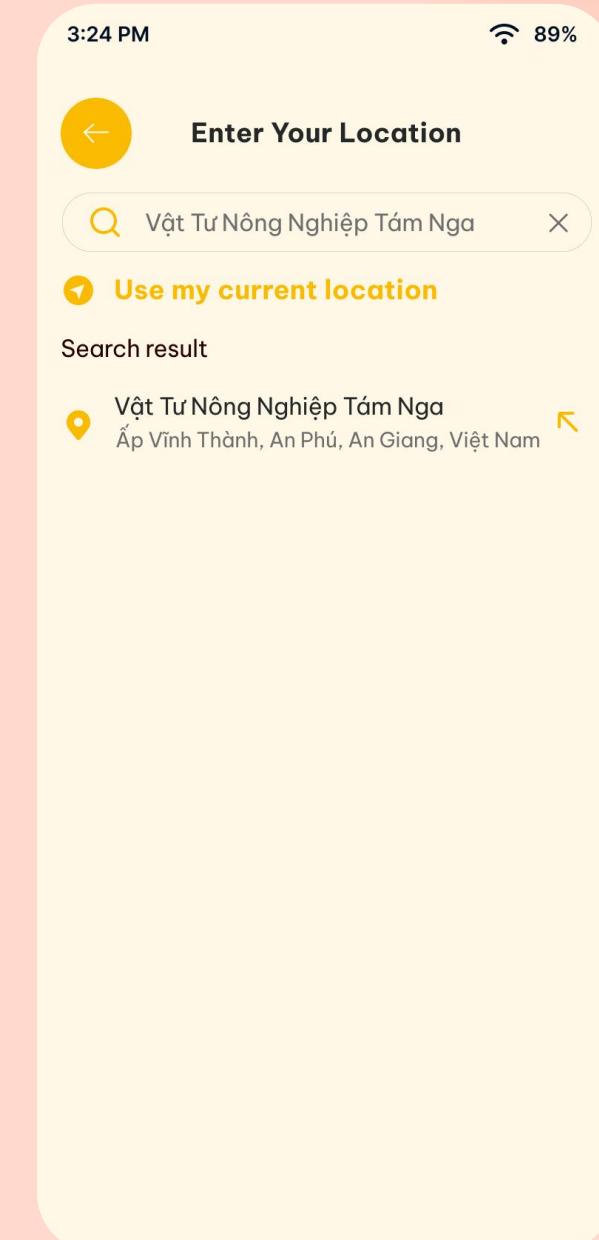
Complete Profile screen



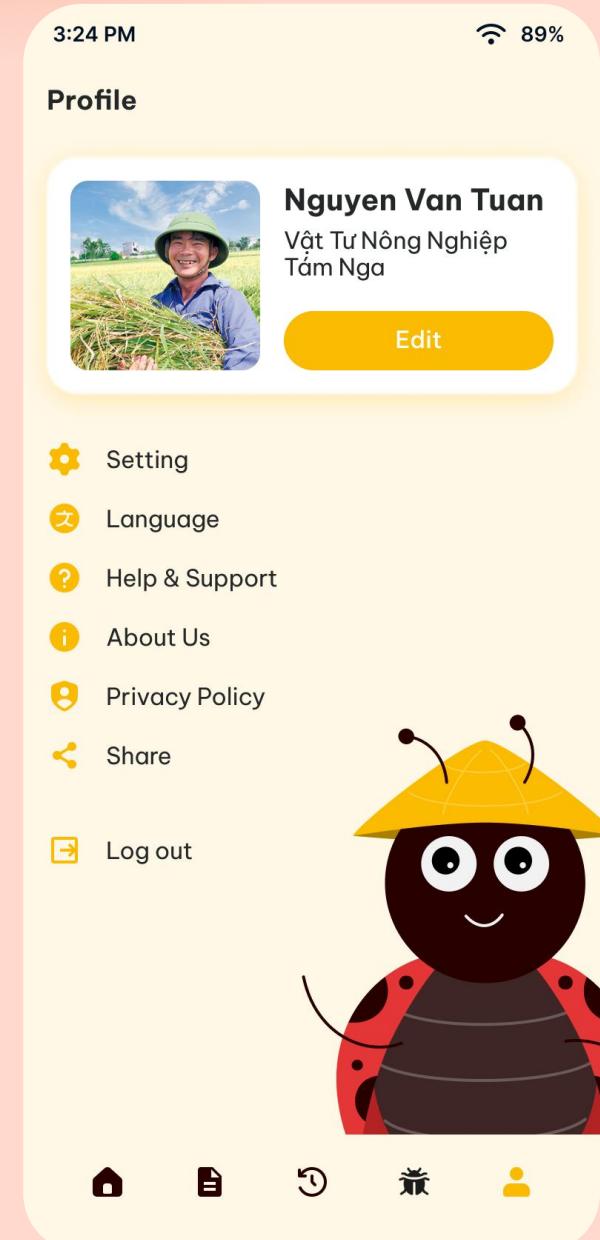
Choose your location screen



Enter Location Manually screen



Profile screen

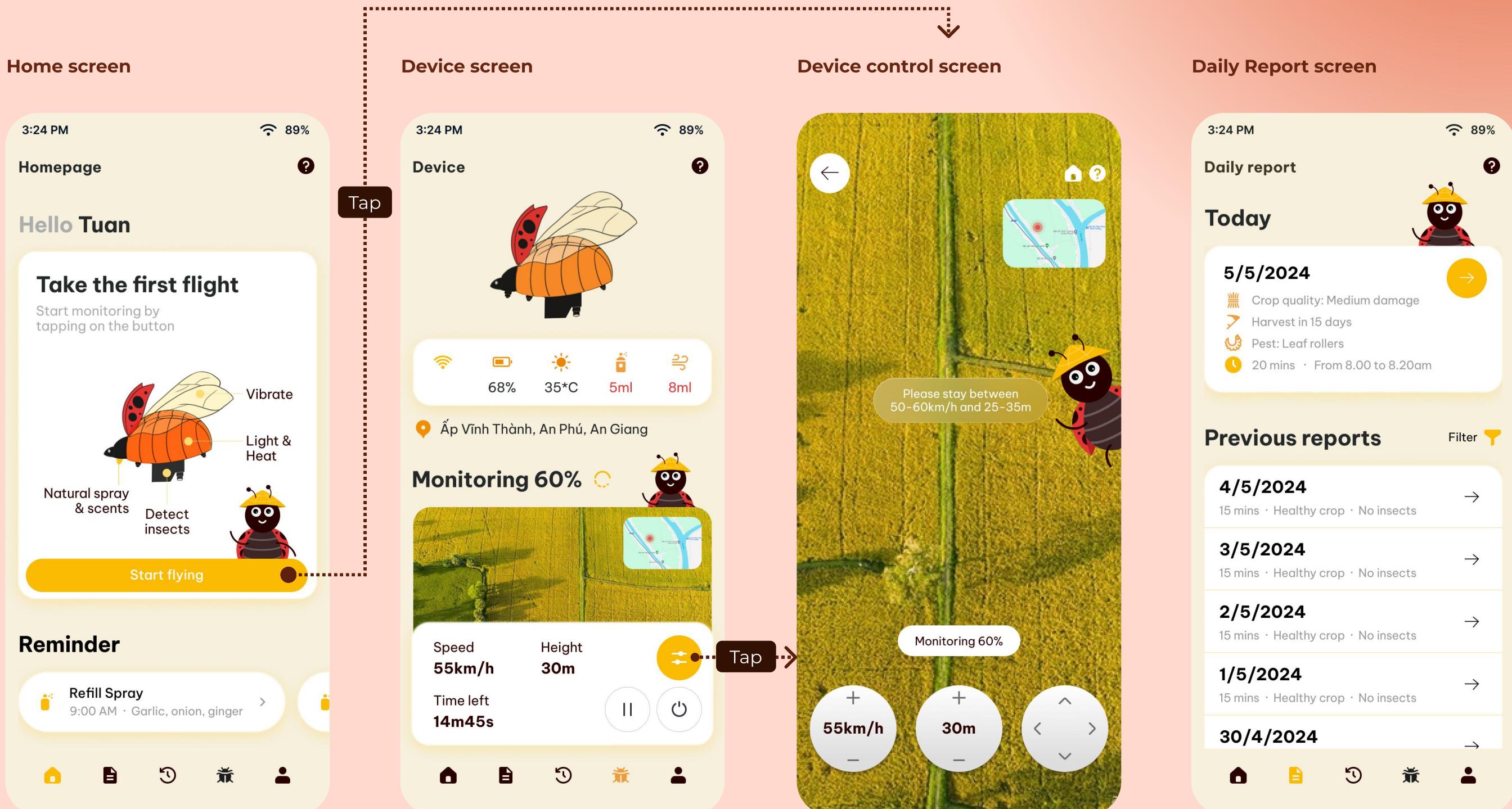


"Choose Your Location" is now highlighted and set in the error state to remind user to choose location. Also, "Complete Profile" button's disabled so that the user will no longer make mistake clicking on it before choosing location

The old circle that bordered the location icons are deleted to make it more consistent.

Instead of underline button for Edit, I changed it to the rounded yellow button like others to make it even more consistent. I made a little change to layout to highlight the profile. Also, "Log out" button is set like other sections above to make it less wanted to log out.

Basic functions



I changed the layout of the device breakdown. The user can tap on each parts to see the functions. To avoid having 2 buttons with the same functions, "Start flying" will now lead to the new device control screen.

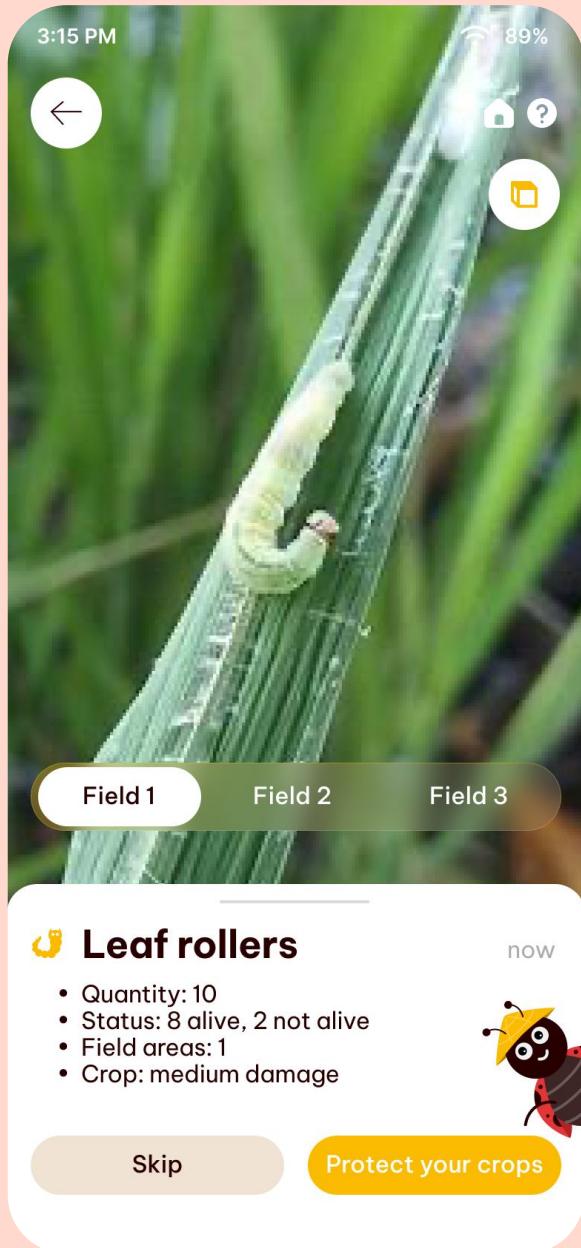
Spray and scent input capacity is now put inside the top bar. Location map is changed to a mini-view, and location's below the top bar. I also changed the layout to be more consistent.

In this page, user can change the height, speed and move around the device with a full-screen real-time camera. The ladybug will appear to remind about the restrictions of height and speed change.

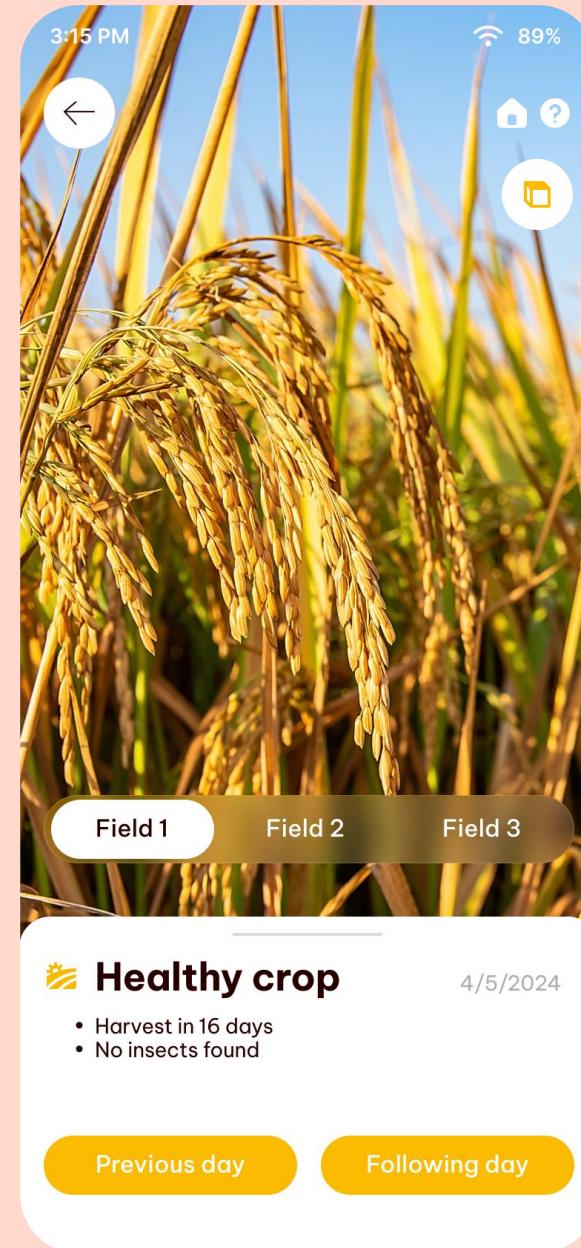
Fixing the main problem of swiping & clicking, I made the report clickable and will directly lead to the report details screen. Layout are a little bit changed to highlight Today report.

Details screen

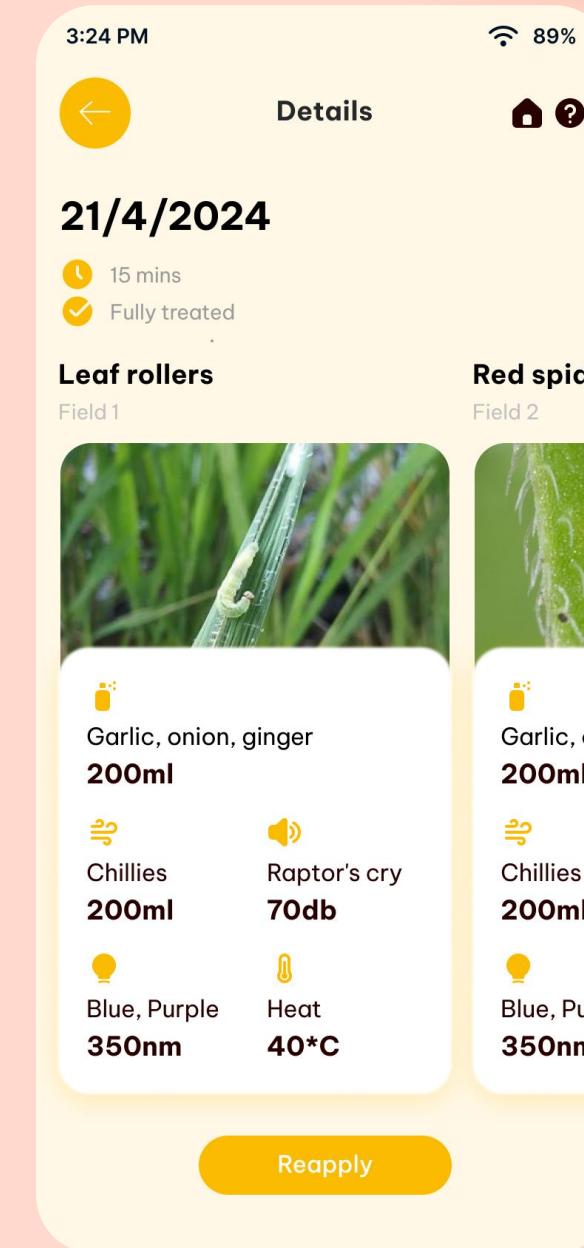
Report Detail screen (with insects)



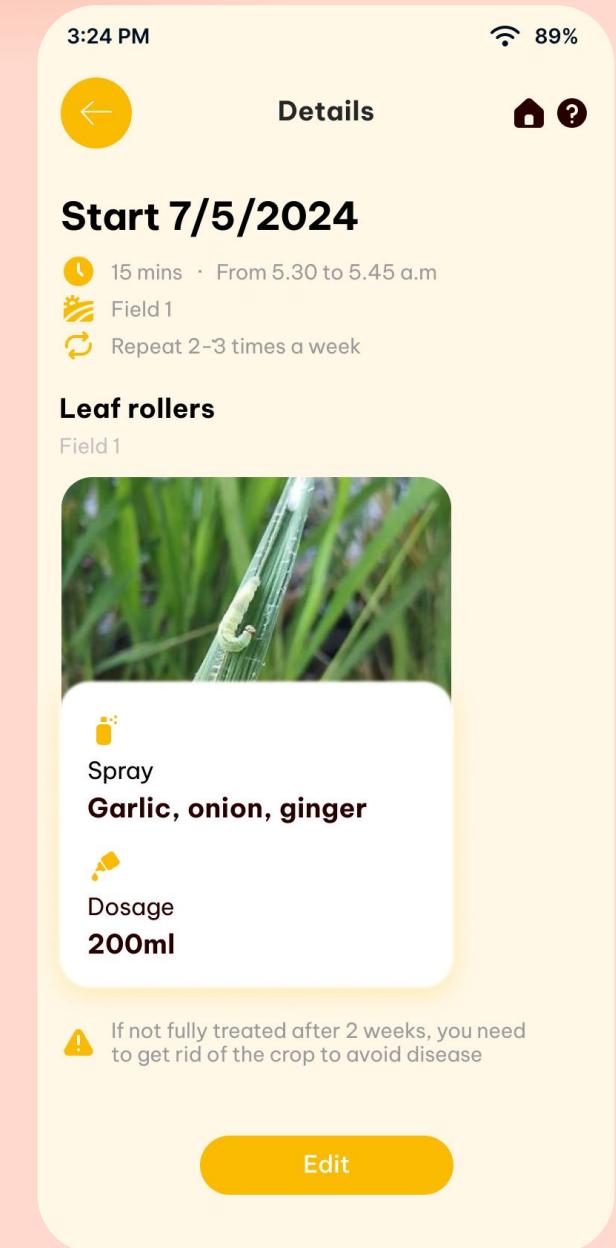
Previous Report Details (no insects)



Treatment details screen



Scheduled treatment details screen

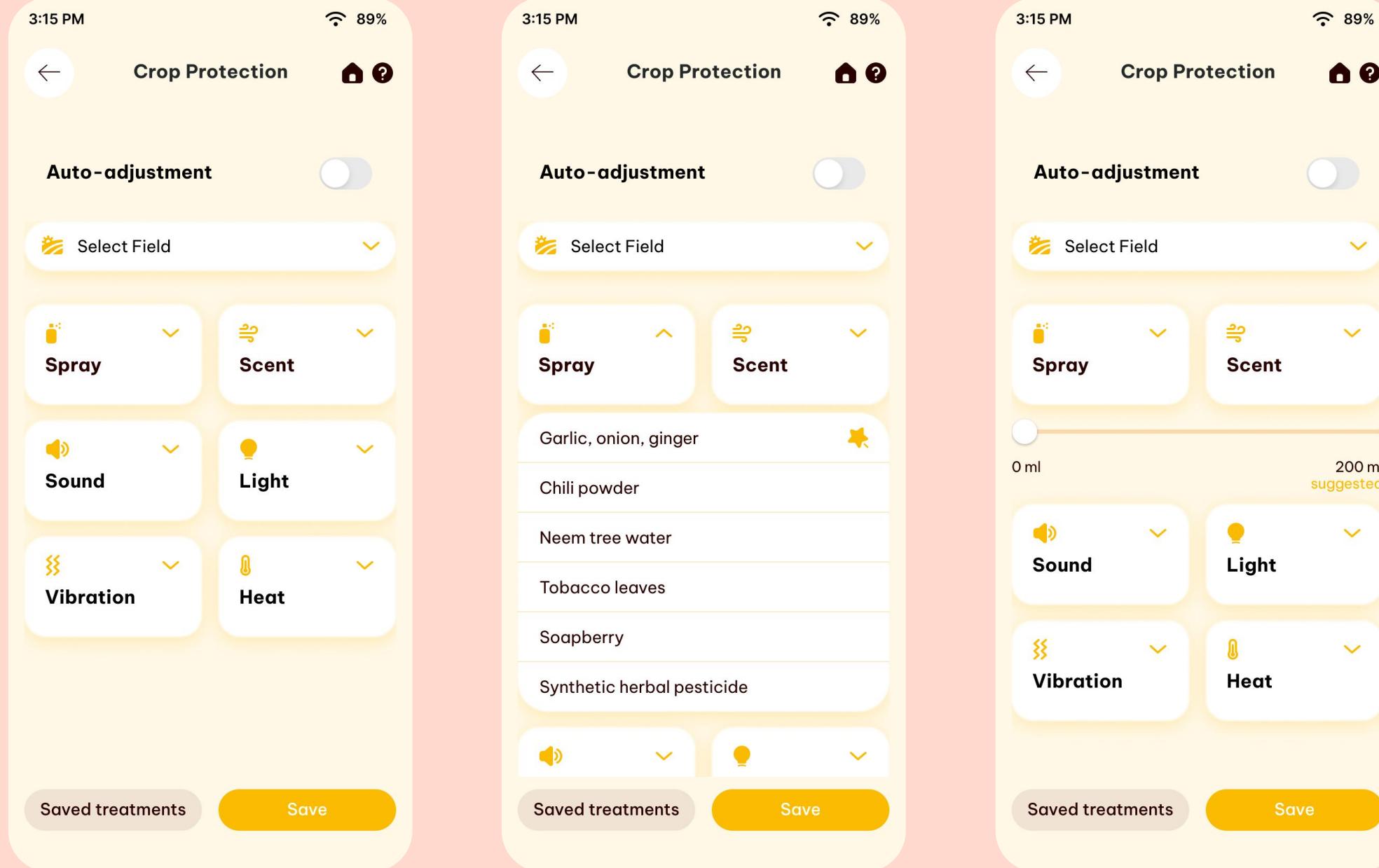


Insect report is moved into the bottom sheets & field switcher's opacity's reduced, revealing the insects image. "Discolorations" and "parcel" are also changed to "damage" and "field" to make it more understandable. A small ladybug is added to encourage protecting the crops. "Following day" button is set to the same color and state with "Previous Day". The images can now be dragable as well.

The layout of these Details pages has a little bit changes to be consistent with other pages (blur-edged containment, icons, images)

Crop protection

Crop protection screen



I changed the layout , divided functions into containments, hide them in dropdowns. That gives the screen more space to breath and less heavy. "Previous treatments" are also changed to "Saved treatments"

Auto-adjustment are highlighted as well.

After choosing, for example, natural sprays, the quantity output will appear. Sliders now are also longer to be easier to use.

Processing + Result

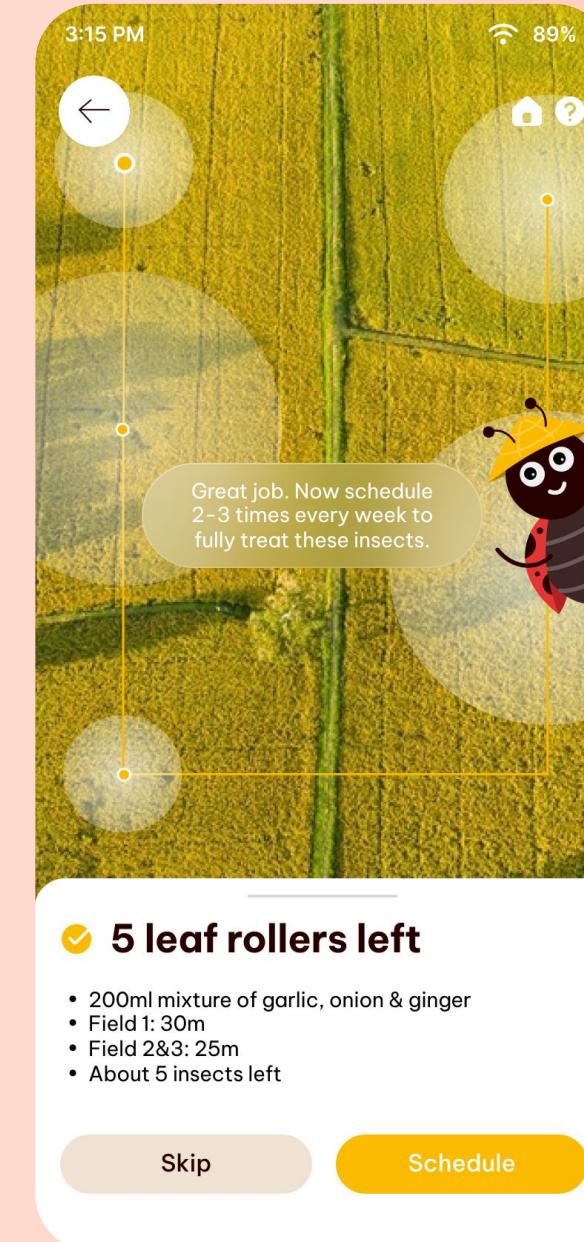
Processing screen



Containments are now bigger, with new processing icons added. New scanning, radiating circles are added to the processing images to make it visually clearer that the device's spraying,...



Result screen (less successful)



If not all of the insects are gone, the ladybug would appear to suggest the user to schedule. I deleted the Auto-treatment option to be more clearer and put the treatment information into the bottom sheets.

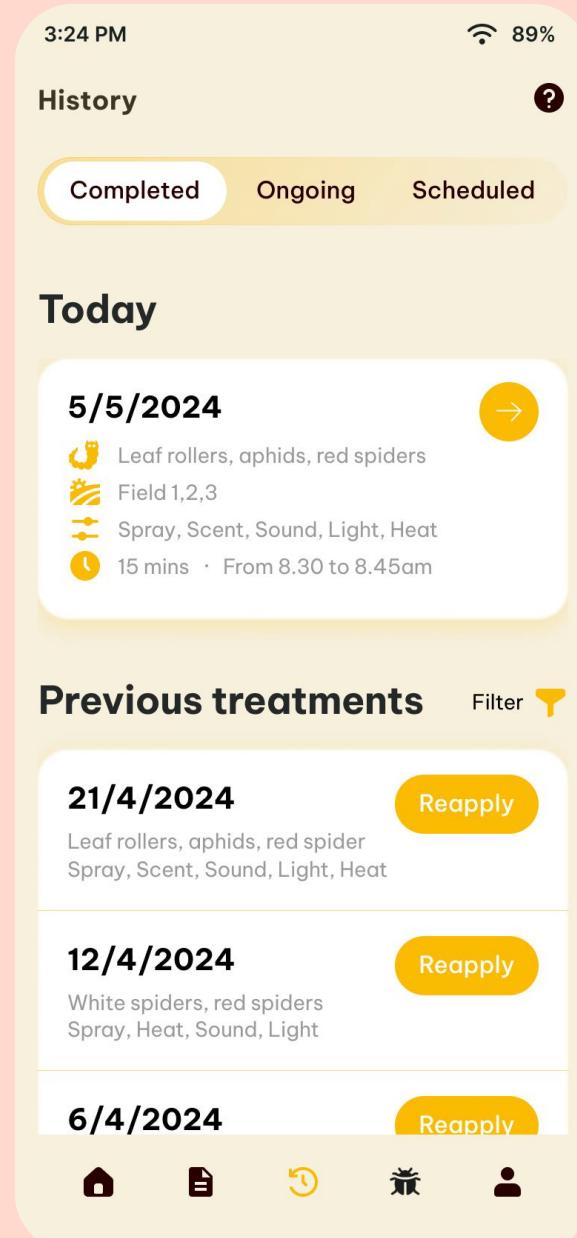
Result screen (really successful)



If all insects are gone, the app will now Auto-save, no longer need the user to make a choice. Ladybug's here to encourage and compliment the farmer.

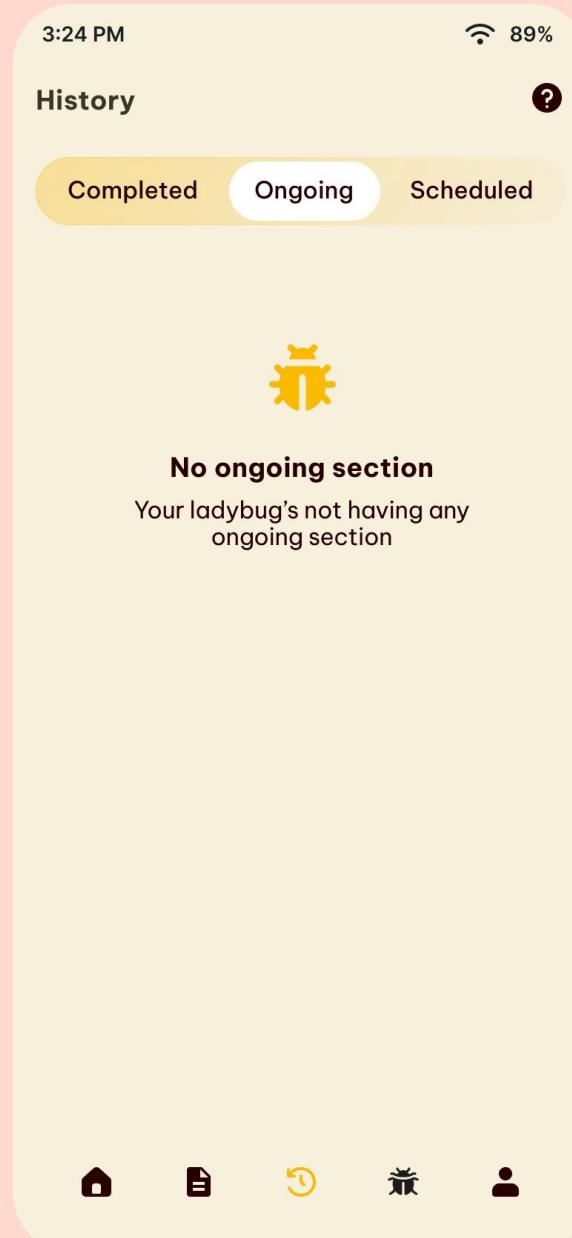
History

Completed treatment screen



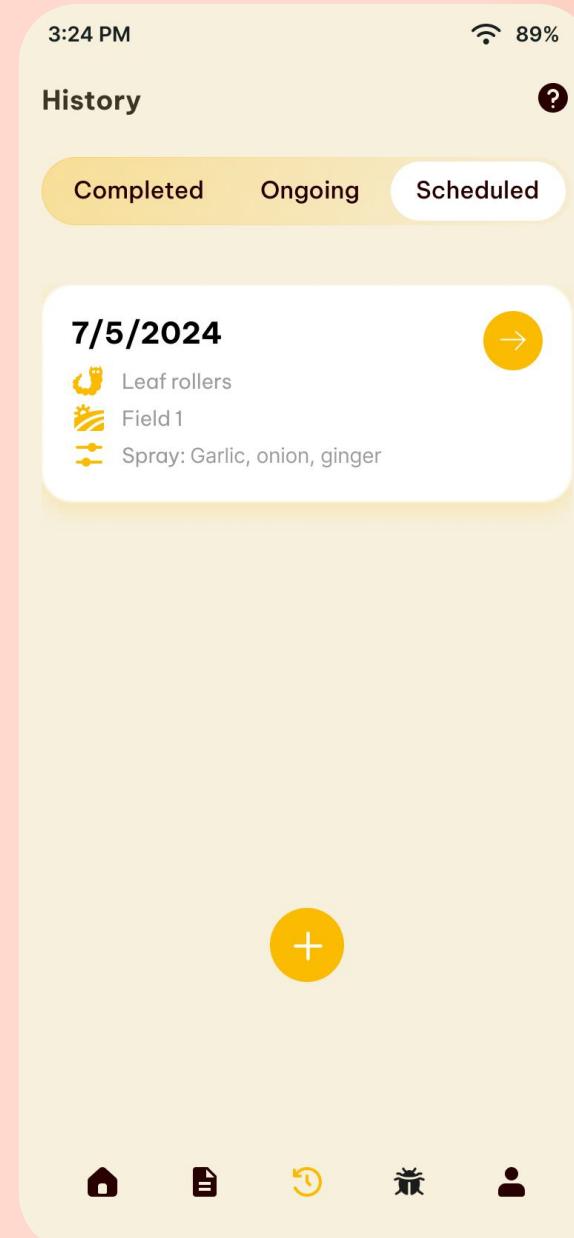
Just like the Daily Report screen, I enable clicking on the sections to navigate to Details screen right away. "Reapply" button is put outside to let the user know they can reuse the saved treatments.

Ongoing treatment screen

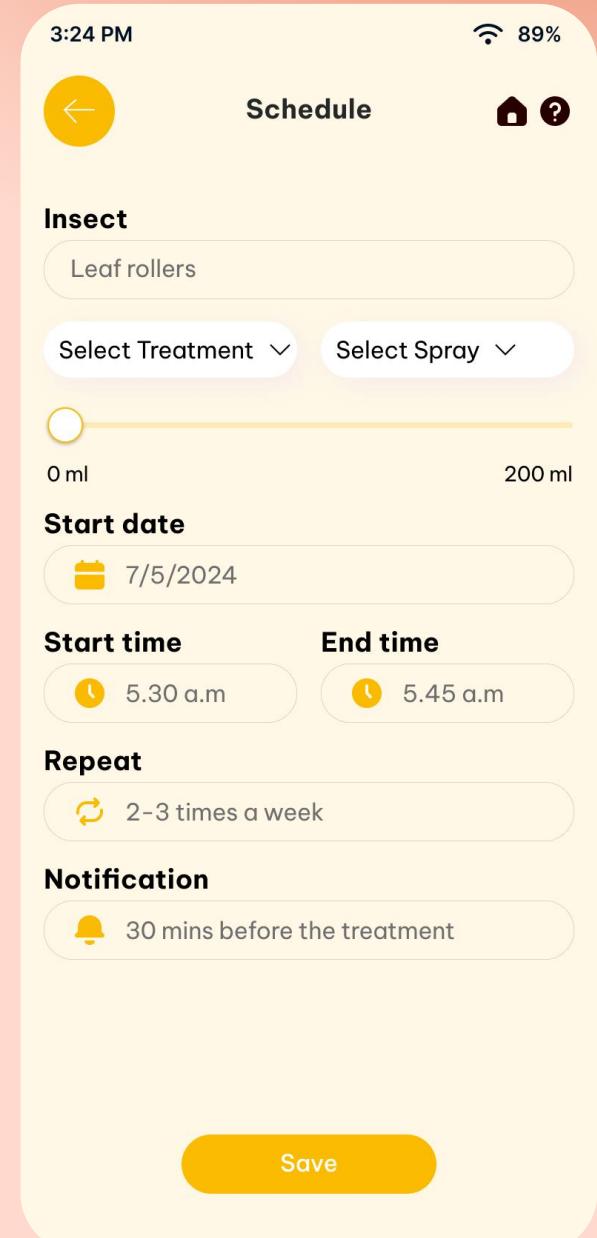


The switcher's changed to the same style with the switcher in Report details screen.

Scheduled treatment screen



Schedule screen

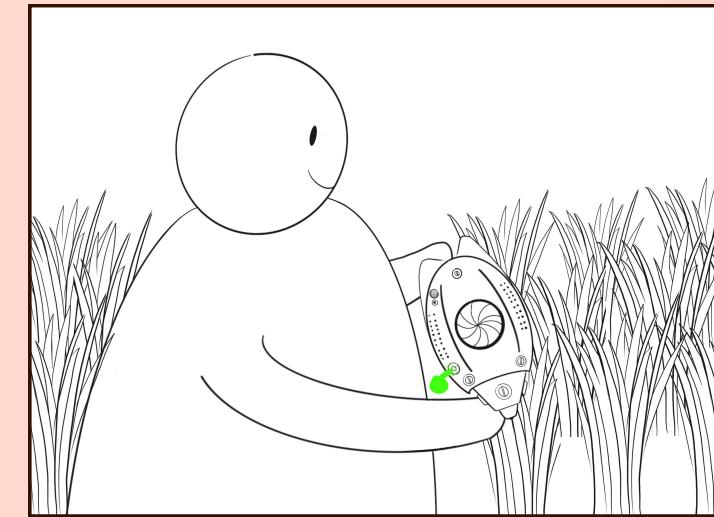


Layout's similar but has a little changes with the icons to be more consistent.

Storyboard



Storyline: Ladybug is a natural predator, it's beneficial to farmer to treat the insect successfully



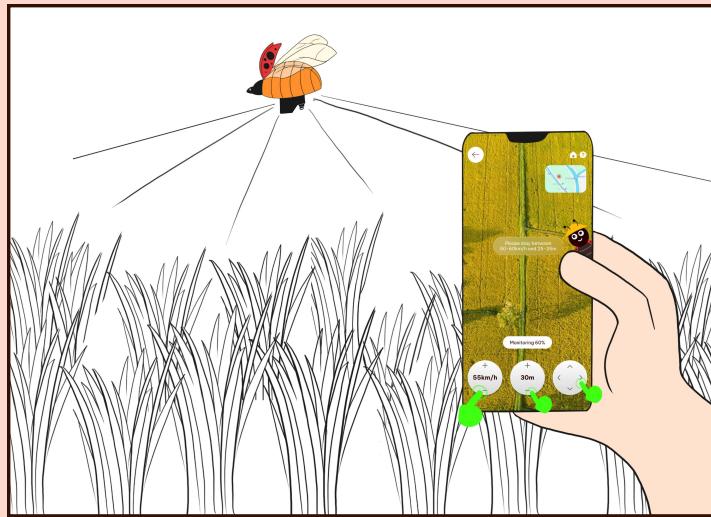
Storyline: The farmer uses the device in the ladybug form to help him treat the insect effectively. He starts his daily routine by turning on his Ladybud to monitor the farm and give daily reports.

Emotions: helpful, secured



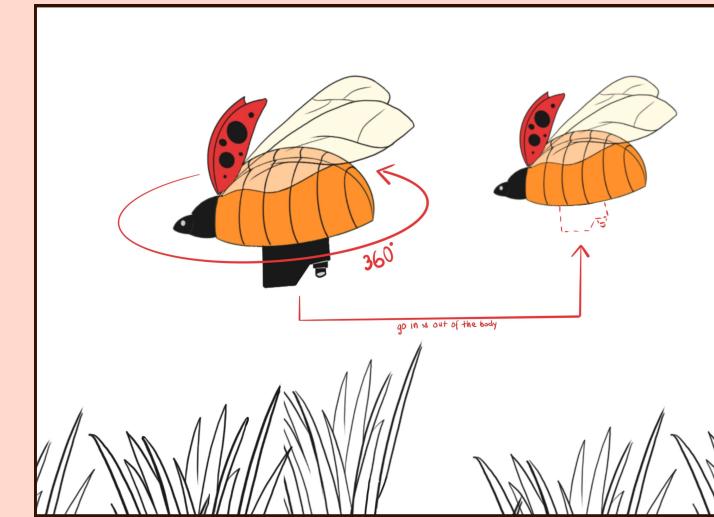
Storyline: Then he connects with the wifi of the Ladybud so that it can connect with the app.

Emotions: helpful, secured



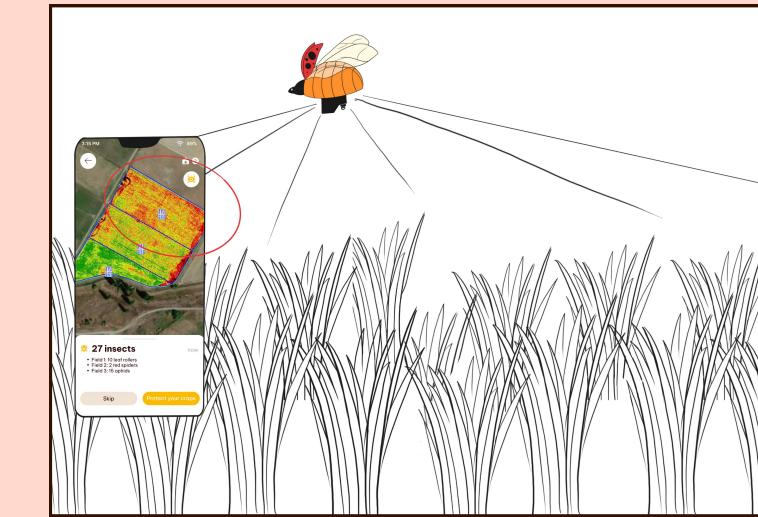
Storyline: He can control the way the Ladybud moves and monitor the farm within the app. It can move around on its own and avoid the obstacles to easily monitor the farm.

Emotions: helpful, secured



Storyline: It can rotate 360 degrees and adjust the sensor to go in/out of the body.

Emotions: helpful, secured



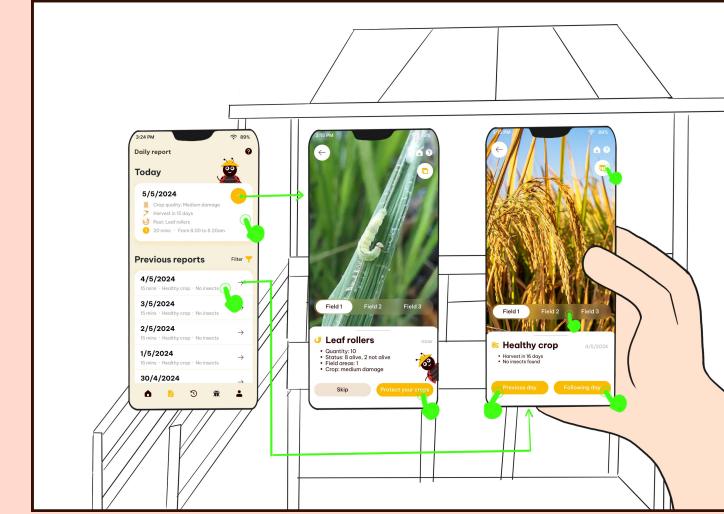
Storyline: The data will be analyzed to RGB images to show the crop quality.

Emotions: helpful, secured



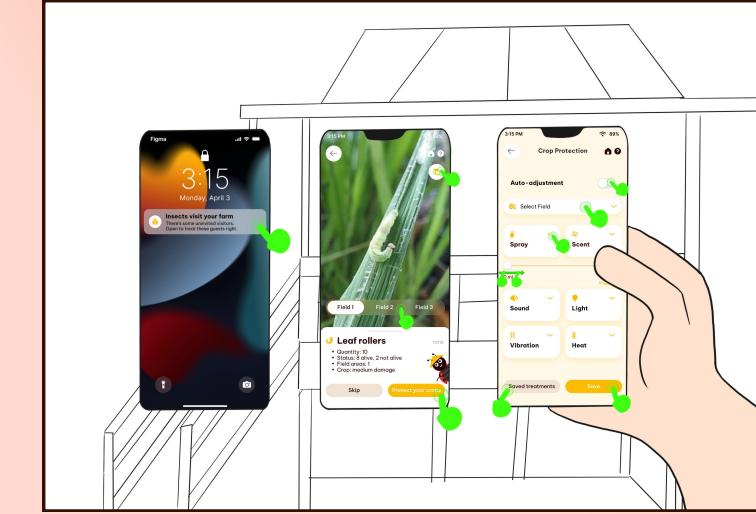
Storyline: After analyzing the affected areas, Ladybud will go closer and capture the pest.

Emotions: helpful, secured



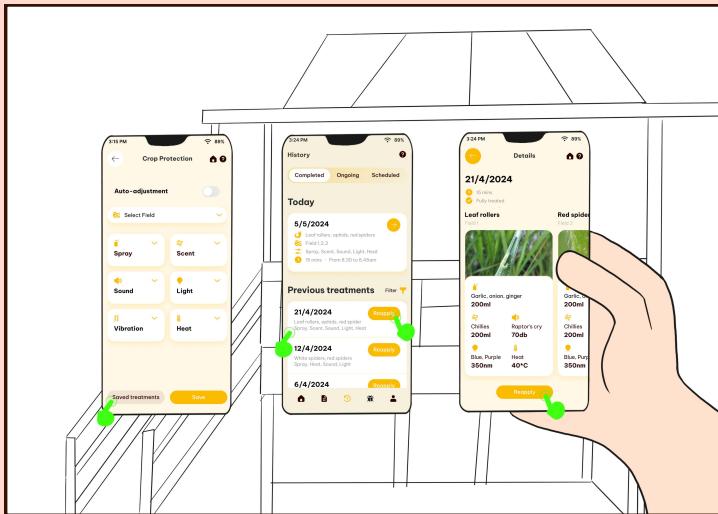
Storyline: After monitoring, it sends a daily report to the app so Tuan can see remotely from his house. Even there's no insects, it still sends the report of the crop quality and day to harvest.

Emotions: helpful, secured



Storyline: If there're insects, at his house, Tuan'd get a notification about the insects attack on his phone. He then has remote access to all the information about the detected insects within the real-time images screen.

Emotions: surprised, helpful, secured



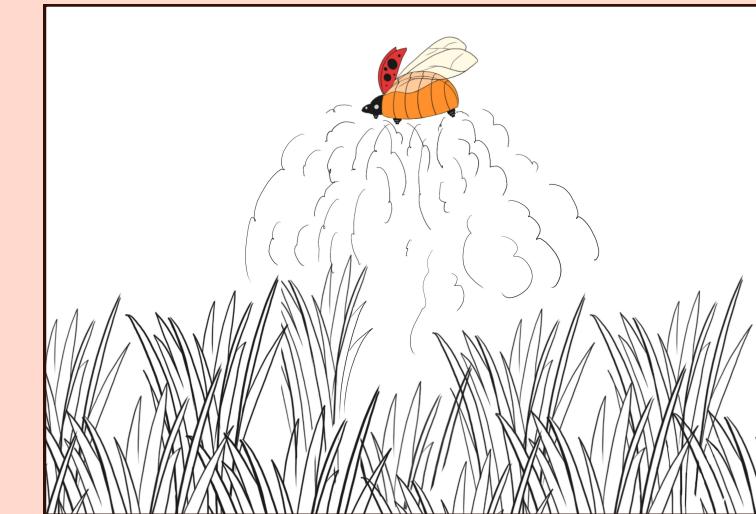
Storyline: Tuan quickly selects the field and treatment, then adjusts the quantity output. He can choose the suggested ones. To save time and effort, he can choose Auto-treatment or reapply the previous treatments that's really effective.

Emotions: surprised, helpful, secured



Storyline: After activating, the Ladybug at the farm works hard to protect the crops. It sprays natural insecticides, a mixture of natural ingredients.

Emotions: fulfilled, helpful, happy, secured



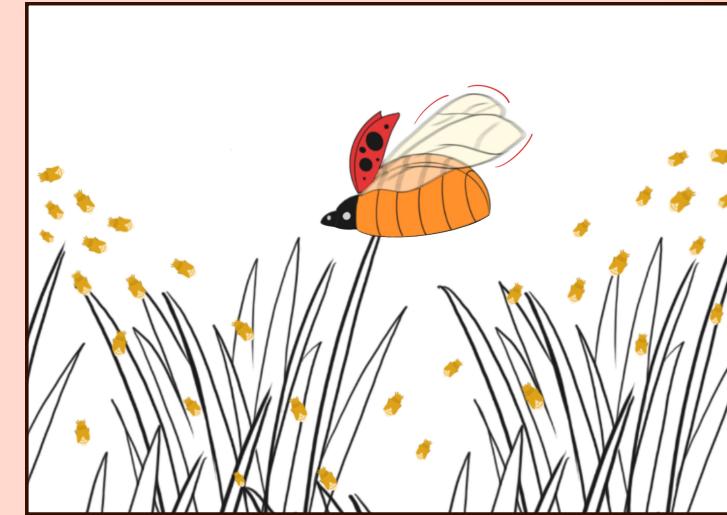
Storyline: The device sprays natural scents, to chase away the insects

Emotions: fulfilled, helpful, happy, secured



Storyline: The device lights up to attract the insects towards it.

Emotions: fulfilled, helpful, happy, secured



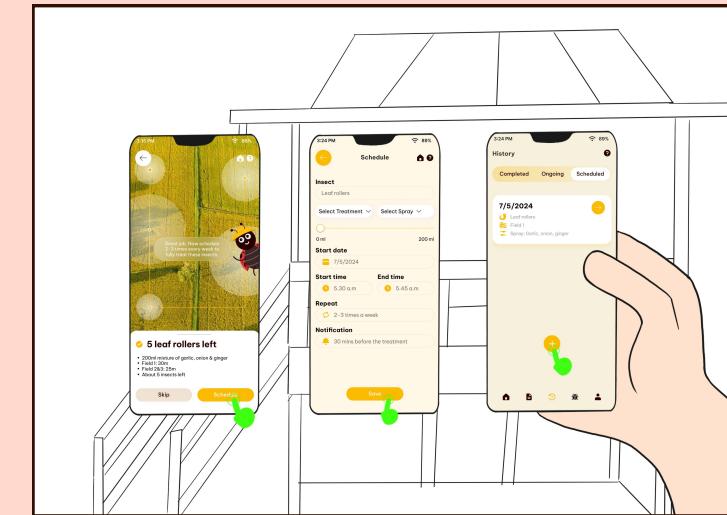
Storyline: It also vibrates using its wings to chase away the insects.

Emotions: fulfilled, helpful, happy, secured



Storyline: It also emits sounds using microphone to chase away the insects.

Emotions: fulfilled, helpful, happy, secured

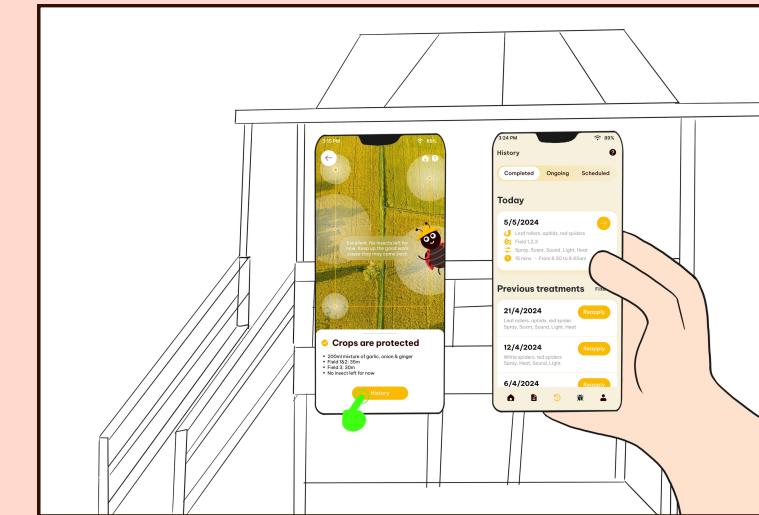


Storyline: It also heats up its own body to chase away the insects.

Emotions: fulfilled, helpful, happy, secured

Storyline: It sends the result to the app when he's away. If the insects are not fully treated, he is recommended to schedule to ensure complete eradication, for example: repeat 2-3 times every week or in the night to use the light to attract insects.

Emotions: surprised, helpful, secured



Storyline: When completed, it auto-saves the section for further insects analysis. He can see it in the Completed sections.

Emotions: fulfilled, helpful, happy, secured



Storyline: Finally, the farmer no longer need to rely on the chemicals and know how to effectively manage the pest problems. His crops stay healthy and insect-free.

Emotions: fulfilled, helpful, happy, secured

Reflection

During this second part of the projects, I got the chance to look back, reflect on my mid-fi prototype. In terms of the user testing, I learned from my experience from the Skills course and did it better for this course testing. After the testing and observation, I realized a lot of things from my prototype isn't working out and I only can get the insights once I test. It was such a fun experience to get to know about the user's experience and feeling. Through the UX stream, I learned that I need to open my mind and empathize with others thoughts, feelings and experience.

I did encounter lots of difficulties within the assignments. The deadline's really short for me to do both user-testing and prototype refinement. I still have some skill issues to fully refine my prototype the way I want but overall, I think it has gotten a lot better from the mid-fi. If I got more time to do, I think I'd try different layout options and test it to see what's best since my own opinions only doesn't matter as much as the users'.

Overall, I have lots of takeaways from this course and the whole UX stream. It was such a great experience despite all the difficulties and challenges. I tried something I've never done and I wouldn't have made it without the massive support from our lecturers and friends.

Figma link

[Medium fidelity prototype](#)

[High fidelity prototype](#)

[Figjam link \(User-flow\)](#)