

Software User Manual (SUM)

2IPE0 SOFTWARE/WEB ENGINEERING PROJECT

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Abstract

This document is the software user manual for CloudFarmer, developed by CloudFarmers as part of the Software Engineering Project in the Technical University of Eindhoven. The Software User Manual contains all essential information to assist the user make full use of the application with a thorough understanding. This document complies with the ESA software standards [1]

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I Document Status Sheet

I.I General

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I.II Document History

Version	Date	Authors	Reason
0.1	7-10-2019	Mohamed	Initial version.
0.2	10-10-2019	Mohamed	Added tutorials for the views.
0.3	18-10-2019	Léon	Added screenshots and added description for the first section of tutorials.
0.4	23-10-2019	Arthur & Mohamed & Kas	Added text and screenshots for Chapter 3 and Chapter 4.
0.5	25-10-2019	Arthur & Mohamed & Kas	Added text and screenshots for Chapter 3 and Chapter 4.
1.1	31-10-2019	Arthur& Kas	Resized pictures.
1.2	4-11-2019	Arthur	Improve consistency.

II Document Change Records

Version	Date	Section	Reason
0.1	7-10-2019	All	Initial version.
0.2	10-10-2019	3	Added tutorials.
0.3	18-10-2019	3	Added screenshots.
0.4	23-10-2019	3 & 4	Added screenshots and text.
0.5	25-10-2019	4	Added final text.
1.1	31-10-2019	4	Resized pictures.
1.2	4-11-2019	All	Improve consistency.

1 Introduction

1.1 Intended readership

There are four types of CloudFarmer users for whom this document is intended:

- Farm admin: As farm owners, the farm admins will have access to all data pertaining to their farm. They have the jurisdiction to change information related to their farm and control other users' roles on their farm. The farm admin is the class of users with the most rights.
- Farmers: The users engaged in agriculture on the farm. They are managed by the farm admins and hence are capable of less functionalities than the farm admins.
- Researchers: The class of users who carry out experiments and investigations using farm data. Researchers are expected to have a decent scientific background in the field of agriculture so that they can interpret the data they can access using CloudFarmer.
- General users: These users have no specific role on a farm, these users can only see the data of a farm if the farm is set to public mode. They possess the least right compared to the other three parties.

1.2 Applicability

This document is applicable to the latest version of CloudFarmer.

1.3 Purpose

CloudFarmer aims to give its users insights into the information of specific fields. This information will be accessible through an easy to use user interface that displays data gathered from a number of different data sources in an orderly manner.

Therefore, the purpose of this document is to guide users how to use this application through a collection of several step by step tutorials. These tutorials are accompanied by illustrations of the associated pages as well. The functionalities available for every type of user is thoroughly explained in the upcoming sections.

1.4 How to use this document

To learn about the functionalities available to the user, it is advised to have a thorough read through this document and its pages together with the corresponding illustrations. Furthermore, the Software User Manual incorporates various step tutorials to aid the

users make use of CloudFarmer. It is recommended to go through these tutorials before using the application to get acquainted with it.

1.5 Related documents

There is a strong relation between the Software User Manual (SUM) and the User Requirement Document (URD) of CloudFarmer [2]. The URD has a list of requirements and priorities to these requirements whilst the Software User Manual shows how these requirements are implemented.

1.6 Conventions

The italic font is used to indicate CloudFarmer's tab names, field names, column names, menu items and buttons. Furthermore, red arrows and boxes are used to highlight areas of interest.

1.7 Problem reporting

If users require any additional support or encounter problems when using the application, they should refer to the client company, *Praktijkcentrum Voor Precisie Landbouw*. CloudFarmers will not work on the application further upon its completion.

1.8 List of references

- [1] *E.B. for software Standardisation and Control*. ESA software standards, 1991.
- [2] *User Requirements Document*. Technische Universiteit Eindhoven, 2019.

2 Overview

In Chapter 3, tutorials to aid users interact with CloudFarmer are provided. In particular, tutorials for user management and the following views are provided:

- Farms View
- Live View
- History View
- Fields View
- Datamaps View
- Equipment View
- Farm Settings View
- Personal Settings View

Chapter 4 provides a functional description of every view accompanied by a list of possible operations that can be executed on that view. The steps to execute these operations as well as their end results are provided.

Finally, two appendices are provided. Appendix A shows all possible error messages that a user can encounter when using CloudFarmer as well the necessary recovery steps from these errors. Appendix B, the Glossary, defines the terminologies used in this document. It should be noted that it is not necessary to read these appendices before reading the Software User Manual, but rather referred to should an unknown term be encountered.

3 Tutorials

3.1 User Management

3.1.1 Logging in

Functional description: This tutorial shows how a user can log in to CloudFarmer.

Preconditions:

- The user has valid credentials on CloudFarmer.

Procedure:

- Navigate to the CloudFarmer web page. The log-in page will be shown see figure 1.
- Enter the email address in the *Email* field .
- Enter the password in the *Password* field .
- Click the *Log in* button.

Likely errors:

1. The user fills in a wrong email, before clicking the *Log In* button.
2. The user does not fill in an email, before clicking the *Log In* button.
3. The user fills in the wrong password, before clicking the *Log In* button.
4. The user does not fill in the password, before clicking the *Log In* button.
5. The user clicks the *Log In* button but does not submit a (valid) email address.

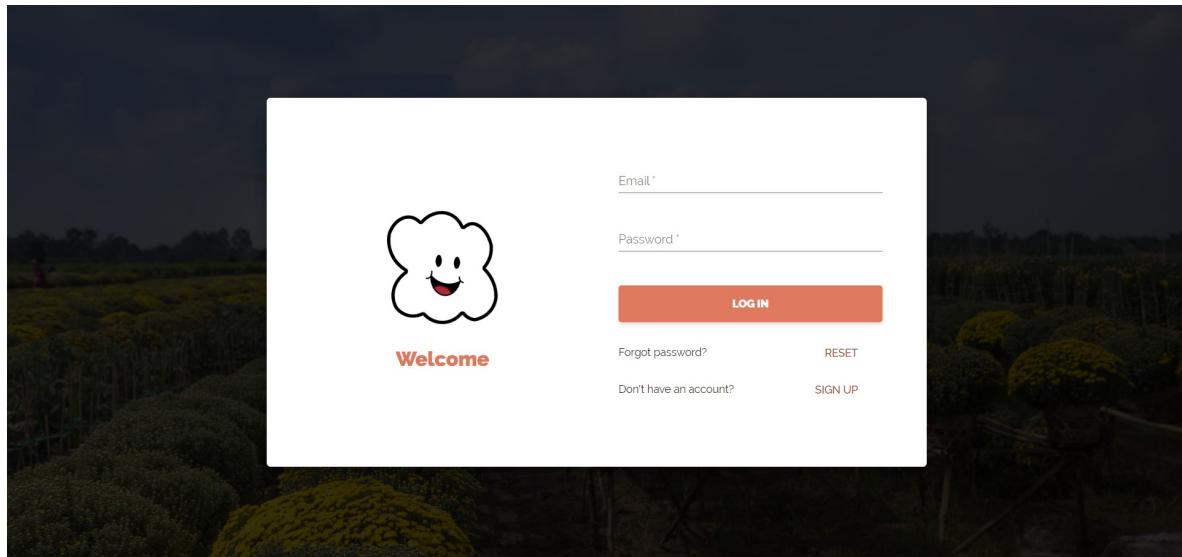


Figure 1: The login page.

3.1.2 Creating an Account

Functional description: This tutorial shows how a user can sign up to CloudFarm.

Preconditions: none

Procedure:

- Navigate to the CloudFarmer web page.
- Click the *Sign Up* button see figure 2.
- You will presented with the sign up screen see figure 3.
- Enter all required information: First name, Last name, email-address, a password and the same password again as confirmation.
- Click the *Sign Up* button see figure 4.

Likely errors:

- First name is not filled in.
- Last name is not filled in.
- User does not enter a valid email address.
- User does not fill in a password.
- Password contains less than 5 characters.
- The password entered in the *Password* field does not match the one entered in the *Confirm Password* field.
- The email address entered already exists.

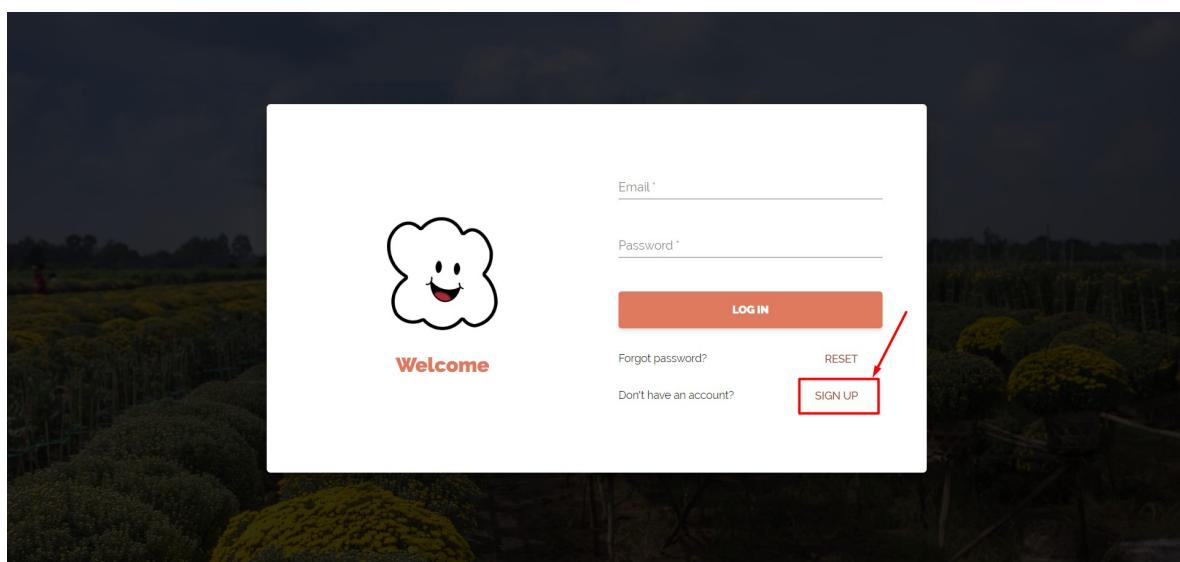


Figure 2: The sign up button on the log-in screen.

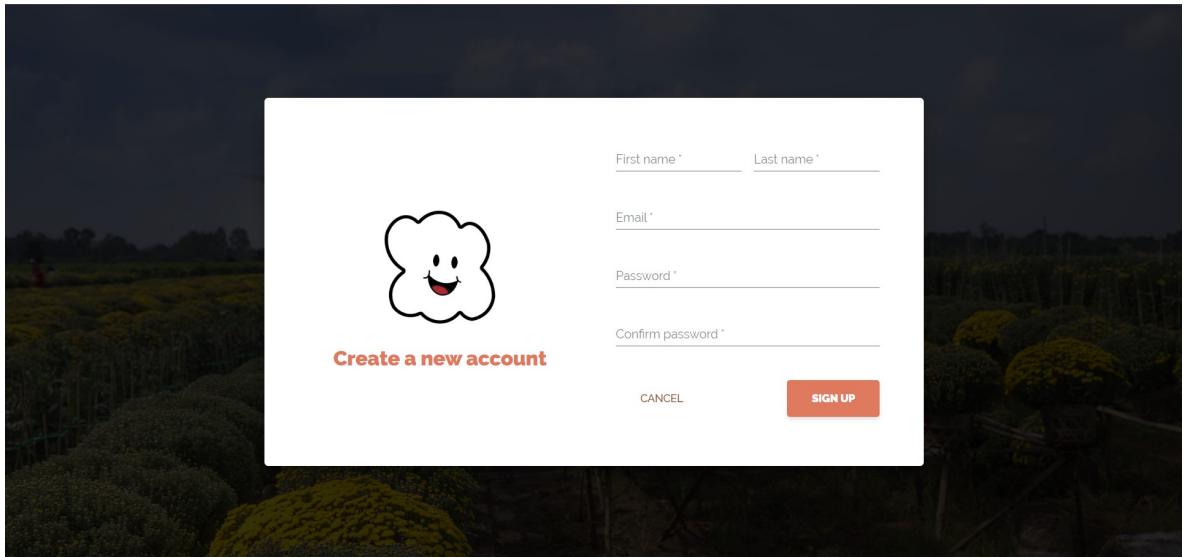


Figure 3: The sign up page.

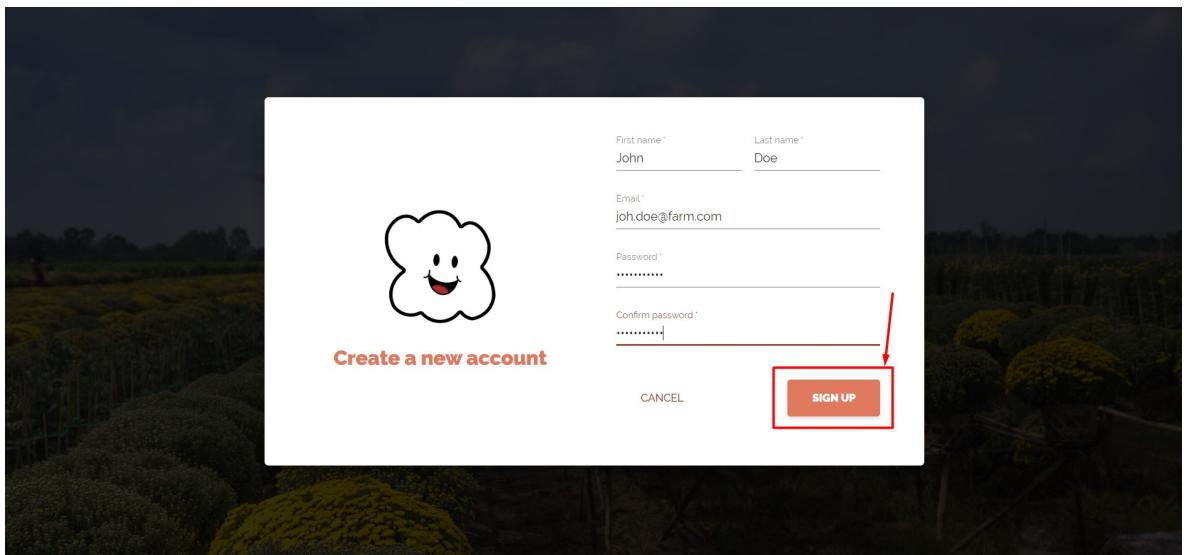


Figure 4: The sign up page with all the information required filled in and the sign up button highlighted.

3.1.3 Logging out

Functional description: This tutorial describes how a user can log out of CloudFarmer.

Preconditions:

- The user is logged in.

Procedure:

- Click the logout icon in the side bar see figure 5.

Likely errors: None.

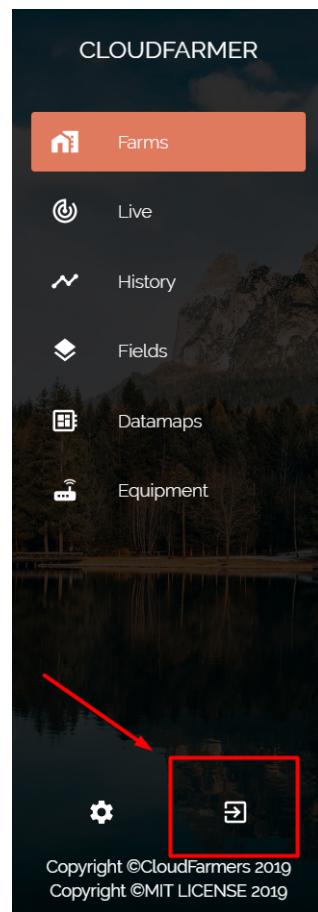


Figure 5: The logout icon.

3.2 Farms View

3.2.1 Navigate to the Farms View

Functional description: This tutorial describes how a user can navigate to the Farms View.

Preconditions:

- The user is logged in.

Procedure:

- Click the *Farms* button in the side bar see figure 6.

Likely errors: None.

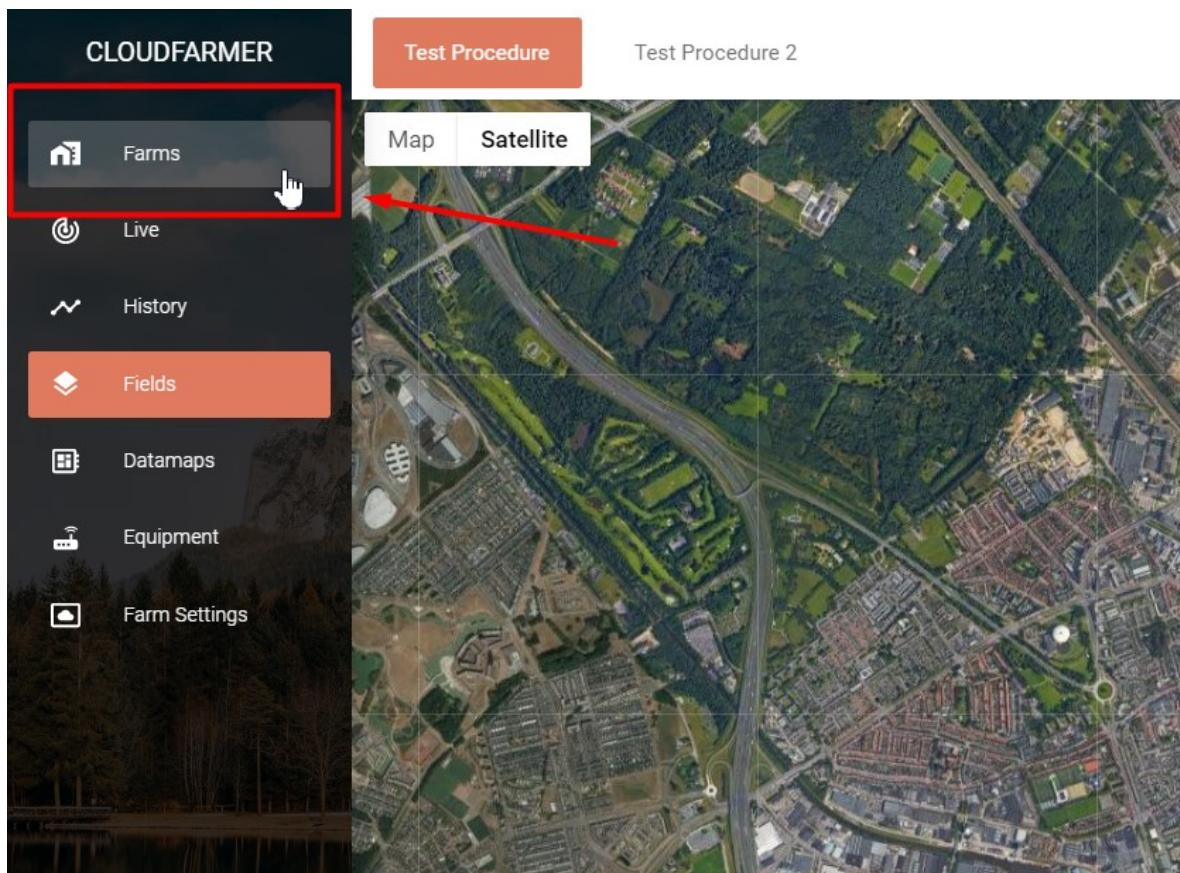


Figure 6: The Farms view button.

3.2.2 Select a farm

Functional description: This tutorial describes how a user can select a farm from the Farms View.

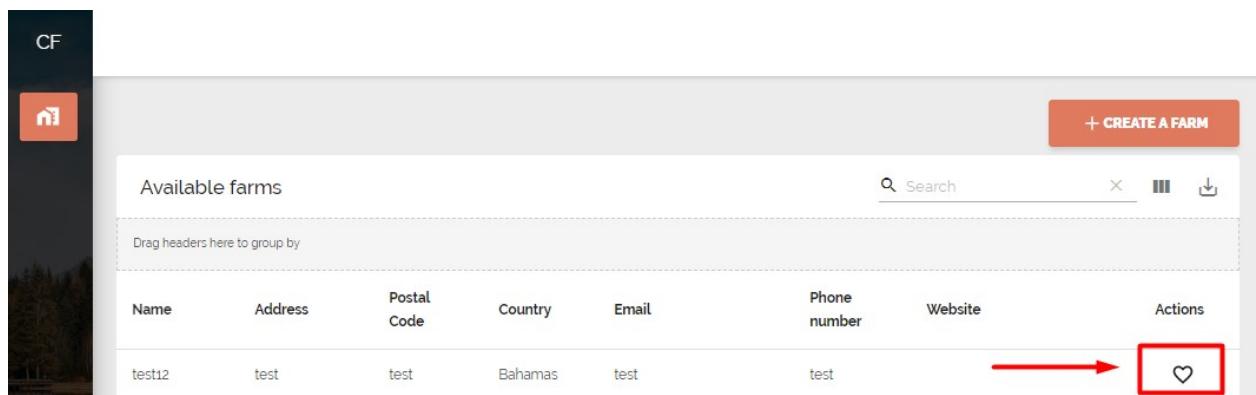
Preconditions:

- The user is logged in.
- The user is on the Farms View.

Procedure:

- Navigate to farms list.
- For the wanted farm, click its associated “” button under the *Actions* column see figure 7.
- The selected farm will now appear as a tab at the top of the page.

Likely errors: None.



Name	Address	Postal Code	Country	Email	Phone number	Website	Actions
test12	test	test	Bahamas	test	test		 

Figure 7: The  button.

3.2.3 Create a farm

Functional description: This tutorial describes how a user can create a farm on Cloud-Farmer.

Preconditions:

- The user is logged in.
- The user is on the Farms View.

Procedure:

- Navigate to the *Create A Farm* button. (See Figure 8)
- Fill in the farm details on the dialog form.
- To finalise the new farm's creation, click on the *Create New Farm* button. To cancel the new farm, click on the *Cancel* button see figure 9.

Likely errors:

- Farm name is not filled in.
- Address is not filled in.
- Postal code is not filled in.
- Email is not filled in
- Phone number is not filled in.
- Website is not filled in.
- Country is not selected.

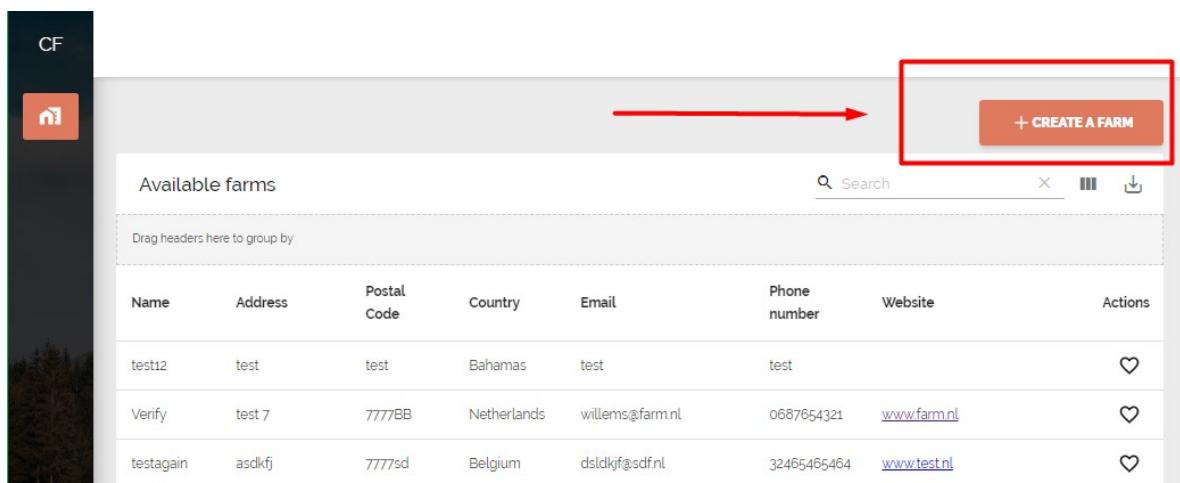


Figure 8: Create Farm Button.

Create a new farm

Farm name *

Mohamed's Farm

Address *

Hemelrijken 181A2

Postal code *

1234

Email: *

mohamedyehia1998@gmail.com

Phone number *

+20 128 2005 338

Website *

www.farm.com

Country *

Egypt

Private

Public

CANCEL

CREATE NEW FARM

Figure 9: Create or Cancel the new farm.

3.2.4 Deselect a farm

Functional description: This tutorial describes how a user can deselect a farm from the Farms View.

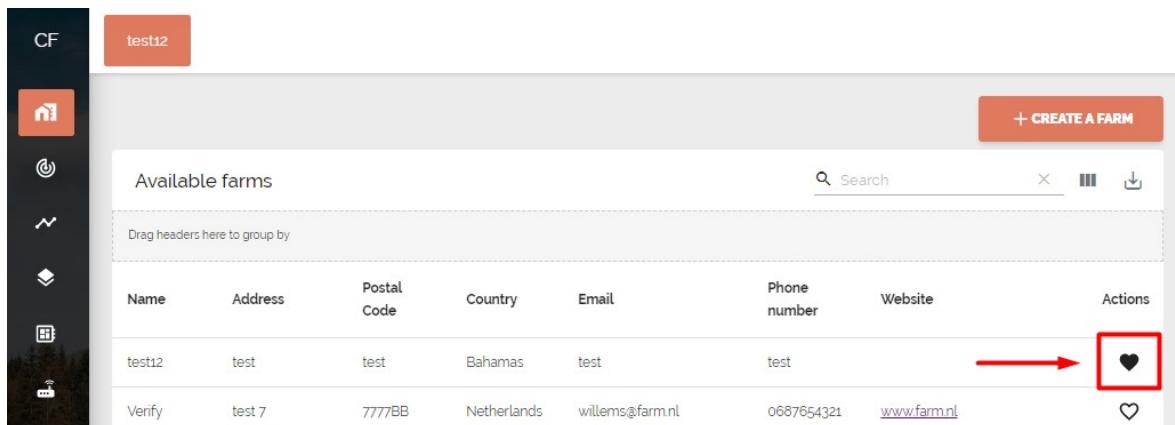
Preconditions:

- The user is logged in.
- The user is on the Farms View.
- The user selected a farm.

Procedure:

- Navigate to farms list.
- For the currently selected farm, click on its associated “♥” button below the *Actions* column. (See Figure 10)

Likely errors: None.



Name	Address	Postal Code	Country	Email	Phone number	Website	Actions
test12	test	test	Bahamas	test	test	www.farm.nl	
Verify	test 7	7777BB	Netherlands	willems@farm.nl	0687654321		

Figure 10: The ♥ button.

3.2.5 Group farms

Functional description: This tutorial describes how a user can group the farms in the farm list.

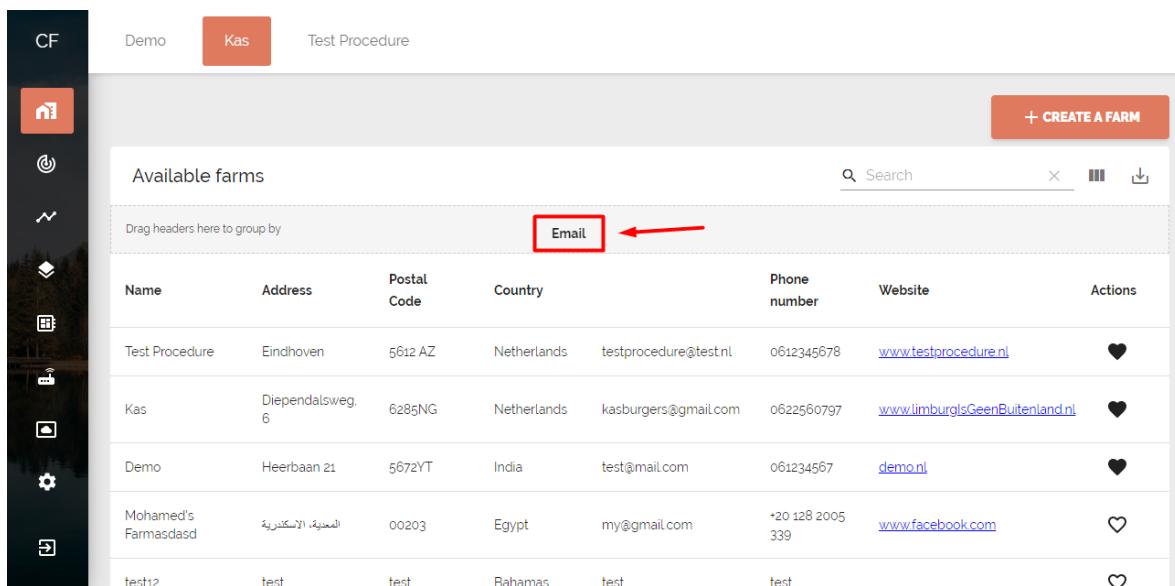
Preconditions:

- The user is logged in.
- The user is on the Farms View.

Procedure:

- Navigate to farms list.
- Press and hold the column name that is desired to be the grouping header. (See Figure 11)
- Drag the column name to the grey bar above the table. (See Figure 12)

Likely errors: None.



The screenshot shows a mobile application interface for managing farms. On the left is a vertical sidebar with icons for home, settings, and more. At the top, there are tabs for 'Demo', 'Kas' (which is highlighted in orange), and 'Test Procedure'. A red arrow points to the 'Email' column header in the table below, which is highlighted with a red box. The table has columns for Name, Address, Postal Code, Country, Phone number, Website, and Actions. The 'Actions' column contains heart icons. The 'Email' column header is positioned above the table, indicating it is being used as a grouping header.

Name	Address	Postal Code	Country	Phone number	Website	Actions
Test Procedure	Eindhoven	5612 AZ	Netherlands	testprocedure@test.nl	0612345678	www.testprocedure.nl
Kas	Diependalsweg, 6	6285NG	Netherlands	kasburgers@gmail.com	0622560797	www.limburgIsGeenBuitenland.nl
Demo	Heerbaan 21	5672YT	India	test@mail.com	061234567	demo.nl
Mohamed's Farmasdasd	المندورة، الإسكندرية	00203	Egypt	my@gmail.com	+20 128 2005 339	www.facebook.com
test12	test	test	Bahamas	test	test	

Figure 11: The *Email* column is selected to be the grouping header.

The screenshot shows a software application interface for managing farms. At the top, there are navigation tabs: 'Demo', 'Kas' (which is highlighted in orange), and 'Test Procedure'. On the far left is a vertical sidebar with icons for home, back, forward, and other functions. The main area is titled 'Available farms' and contains a table of farm data. The table has columns for Name, Address, Postal Code, Country, Phone number, Website, and Actions. Above the table, a header bar includes a search input field with a magnifying glass icon, a clear button (X), and filter/download icons. A red box highlights the 'Grouped By' header, and a red arrow points to the 'Email' column header. The table data shows several entries, each starting with a greater-than symbol and followed by an email address.

Name	Address	Postal Code	Country	Phone number	Website	Actions
> Email:						
> Email:	asd@tue.nl					
> Email:	atptest@gmail.com					
> Email:	bram@huizevanleeuwen.nl					
> Email:	dsldkjf@sdf.nl					
> Email:	farmanje@farm.nl					

Figure 12: The bar above the farms table.

3.2.6 Filter farms

Functional description: This tutorial describes how a user can filter farms that satisfy a criteria they set.

Preconditions:

- The user is logged in.
- The user is on the Farms View.

Procedure:

- Navigate to farms list.
- Enter a search string in the search bar. (See Figure 13)

Likely errors: None.

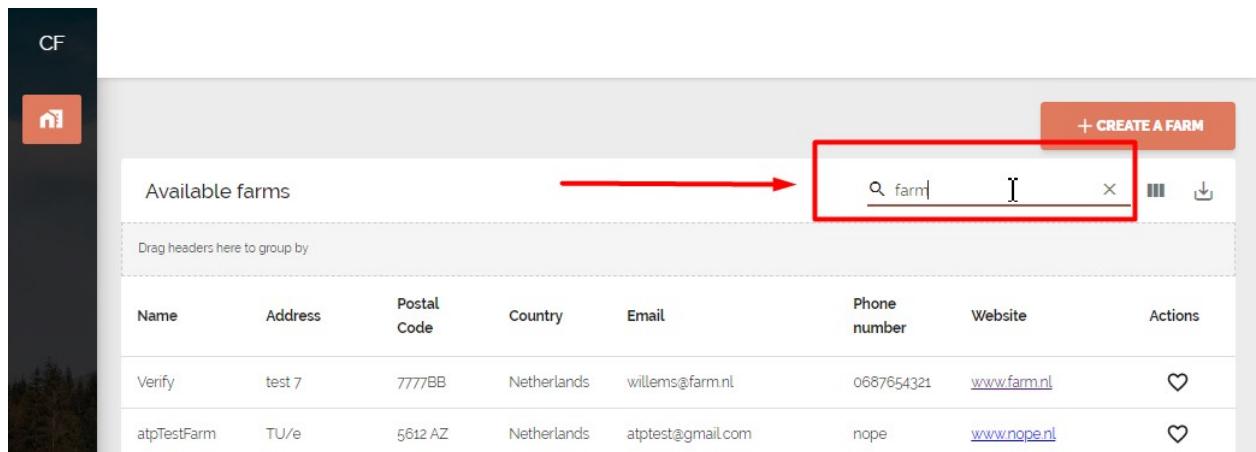


Figure 13: Farms View Search bar.

3.2.7 Select farm attributes to be displayed

Functional description: This tutorial describes how a user can choose which properties of the farms get to be displayed on the Farms View.

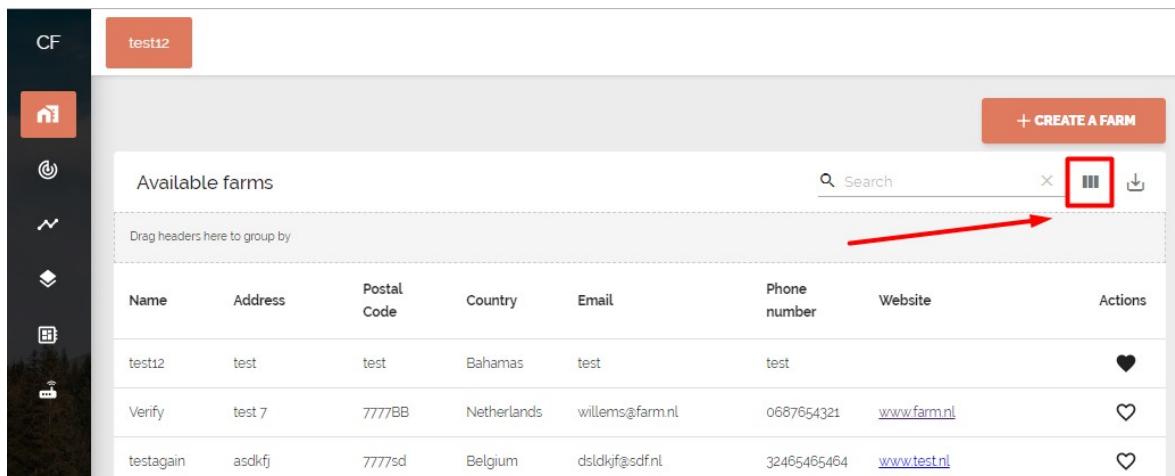
Preconditions:

- The user is logged in.
- The user is on the Farms View.

Procedure:

- Navigate to farms list.
- Click the *Show Columns* button. (See figure 14)
- Tick the desired properties from the list dialog. (See figure 15)

Likely errors: None.



The screenshot shows a web-based application interface for managing farms. On the left is a sidebar with icons for file operations like Create, Edit, Delete, and a search bar. The main area has a header with 'test12' and a '+ CREATE A FARM' button. Below is a table titled 'Available farms' with columns: Name, Address, Postal Code, Country, Email, Phone number, Website, and Actions. A red arrow points to the 'Actions' column header, which is enclosed in a red box. The table contains three rows of sample data.

Name	Address	Postal Code	Country	Email	Phone number	Website	Actions
test12	test	test	Bahamas	test	test	www.farm.nl	
Verify	test 7	7777BB	Netherlands	willems@farm.nl	0687654321	www.farm.nl	
testagain	asdkgfj	7777sd	Belgium	dsldkjf@sdf.nl	32465465464	www.test.nl	

Figure 14: Farms View Show Columns Button.

The screenshot shows a software interface for managing farms. On the left, there's a sidebar with icons and the text 'CF'. In the center, a table titled 'Available farms' displays several farm entries. A red arrow points from the table to a modal window titled 'Add or remove columns'. This modal lists seven columns with checkboxes: Name, Address, Postal Code, Country, Email, Phone number, and Website. All checkboxes are checked.

Name	Address	Postal Code	Country	Email	Phone number	Website
test12	test	test	Bahamas	test	test	www.farmr.com
Verify	test 7	7777BB	Netherlands	willems@farm.nl	0687654321	www.farmr.com
testagain	asdkfj	7777sd	Belgium	dsldkjf@sdf.nl	32465465464	www.test.nl
Kas	Diependalsweg 6	6285NG	Netherlands	kasburgers@gmail.com	0622560797	www.limburgs.nl

Figure 15: Column headers list dialog.

3.3 Live View

Functional description: This tutorial describes how the user gets to see live data.
Preconditions:

- User is logged in.
- The user is a farm admin, farmer, researcher, or general user, and the farm is set to public, on the selected farm.
- The user is on the live view.

Procedure:

- Click the arrow to see the live data of that crop field see figure 16.

Likely errors: None.

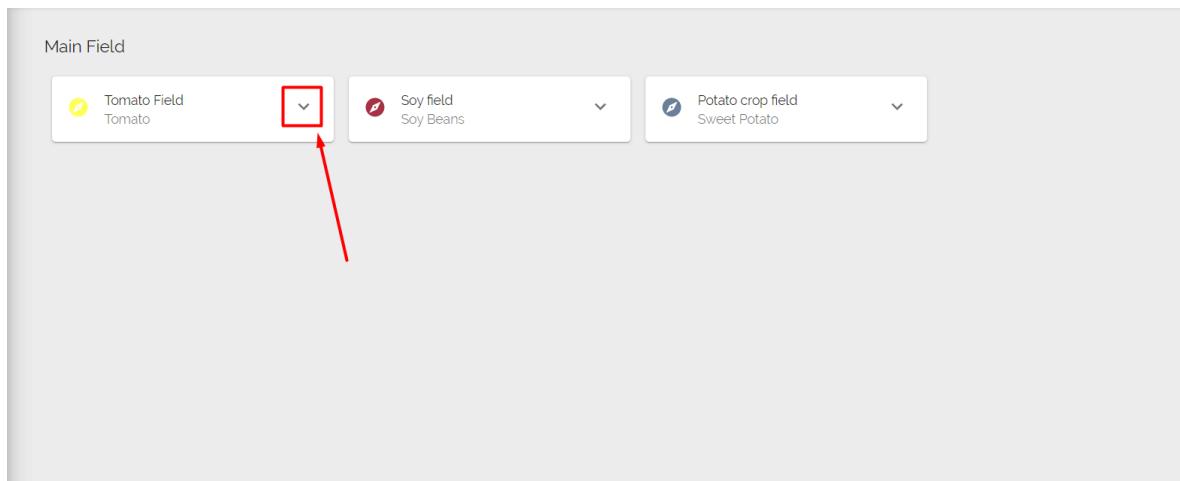


Figure 16: Click on view field information.

3.4 History View

Functional description: This tutorial describes how to set the filters in such a way the users sees the data they want.

Precondition:

- The user is logged in.
- The user is a farm admin, farmer, researcher, or general user, and the farm is set to public, on the selected farm.
- The user is on the history view.

Procedure:

- Select a value for the filters show in figure 17.

Likely errors: None.

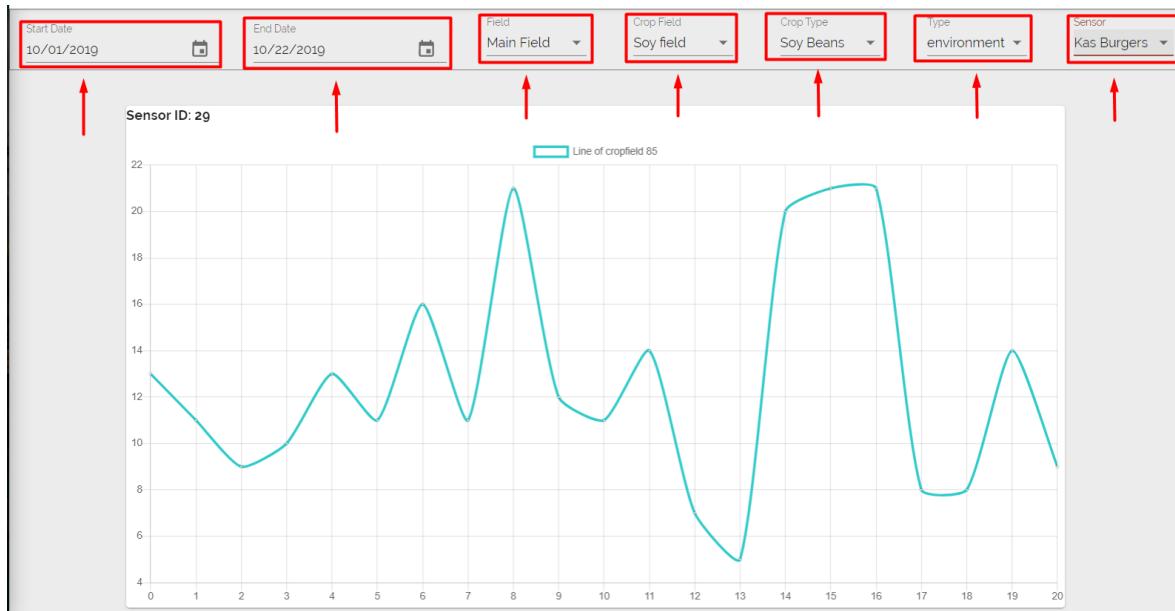


Figure 17: History view.

3.5 Fields View

3.5.1 Add a field/crop field to a farm

Functional description: This tutorial describes how a user can add a field or a crop field to a farm on the Fields View.

Preconditions:

- The user is logged in.
- The user is the farm admin or a farmer in that farm.
- The user is on the Fields View.

Procedure:

- Click the add button at the bottom right corner of the map see figure 18.
- Navigate to the area in the farm to which a field/crop field is to be added.
- Define the field's/crop field's corners by positioning the cursor at the desired location and then click to create that corner as a point.
- Define the rest of the borders such that the resulting region is a closed parameter see figure 19.
- Fill in the dialog form that pops up once the field/crop field is successfully defined.
- After all the information is filled in, press the create field/crop field button see figure 20.

Likely errors:

- Field name is not filled in.
- For a crop field the field it is located in is not selected.
- The crop type is not selected.



Figure 18: Add field button.



Figure 19: Creating closed field.

Cropfield information

Choose what kind of field you want to create

Cropfield Field

Cropfield name *

Field *

Start date
2019/10/21

End date
2019/10/21

Crop type *

Private Public

DISCARD

SAVE

Figure 20: Fill in the field pop-up.

3.5.2 Edit a field's/crop field's borders

Functional description: This tutorial describes how a user can edit the borders of a field or a crop field on the Fields View.

Preconditions:

- The user is logged in.
- The user is the farm admin or a farmer on that farm.
- The user is on the Fields View.

Procedure:

- Click the edit button at the bottom right corner of the map see figure 21.
- Navigate towards the desired field/ crop field.
- Click and hold one of the dots on the border of the field/crop field see figure 22.

- Drag the dot to the desired location and then drop the dot at the desired location.
- Press the save button in the left bottom corner of the map see figure 23.

Likely errors: None.

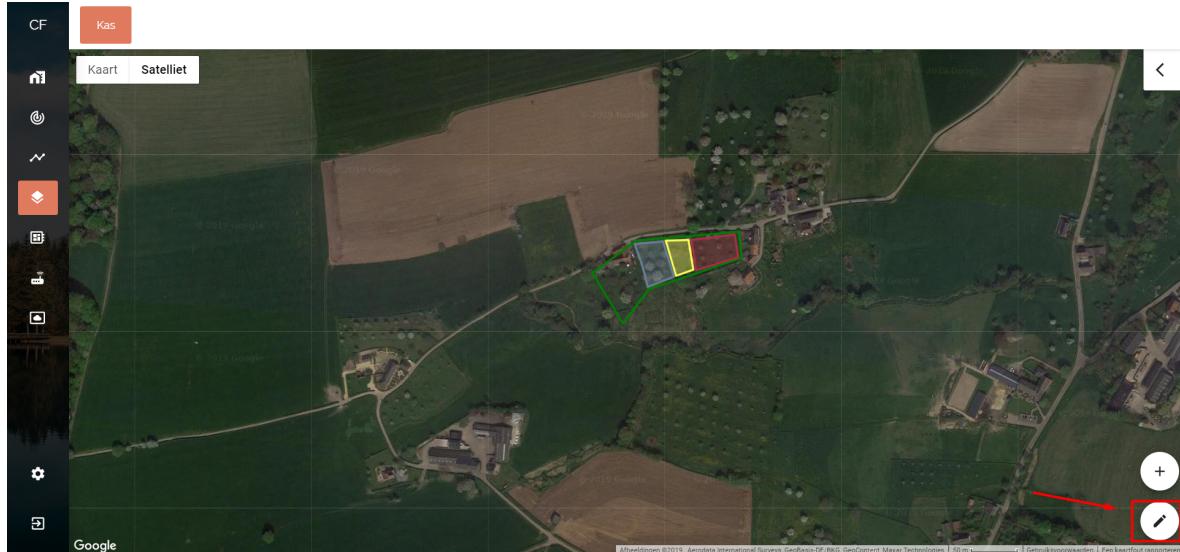


Figure 21: Edit field border button.



Figure 22: Drag able dots on the field borders.



Figure 23: Save edited border.

3.5.3 Delete a field/ crop field

Functional description: This tutorial describes how a user can delete a field or a crop field on the Fields View.

Preconditions:

- The user is logged in.
- The user is the farm admin or a farmer on that farm.
- The user is on the Fields View.

Procedure:

- Click the arrow at the top right of the map to show the field list see figure 24.
- Click the three dots next to the name of the field/crop field see figure 25.
- Click the delete field.
- Click the confirm button on the pop-up see figure 26.

Likely errors: None.

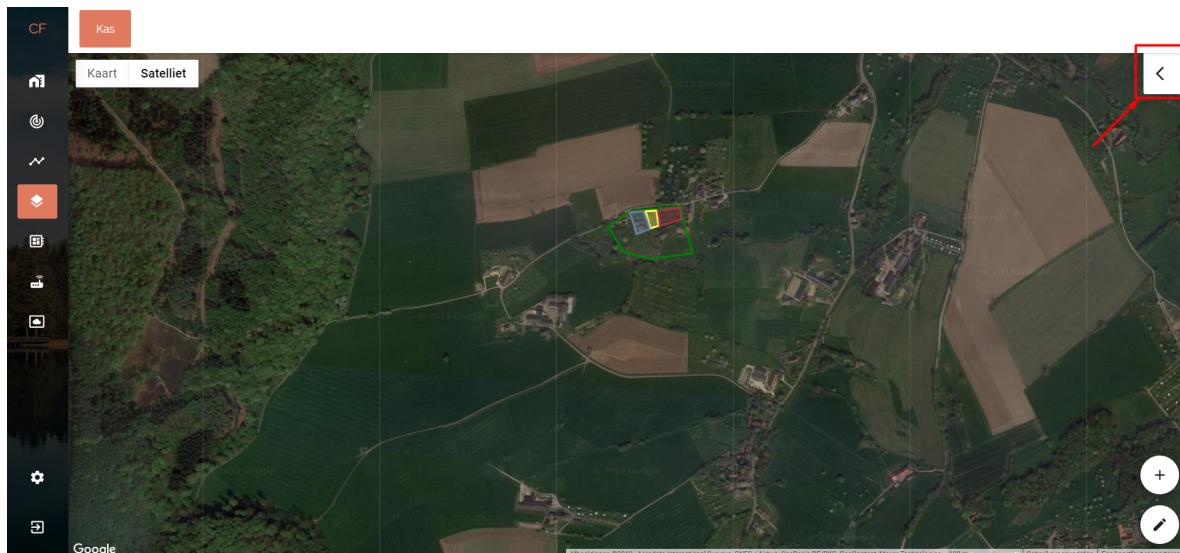


Figure 24: Open the fields list.

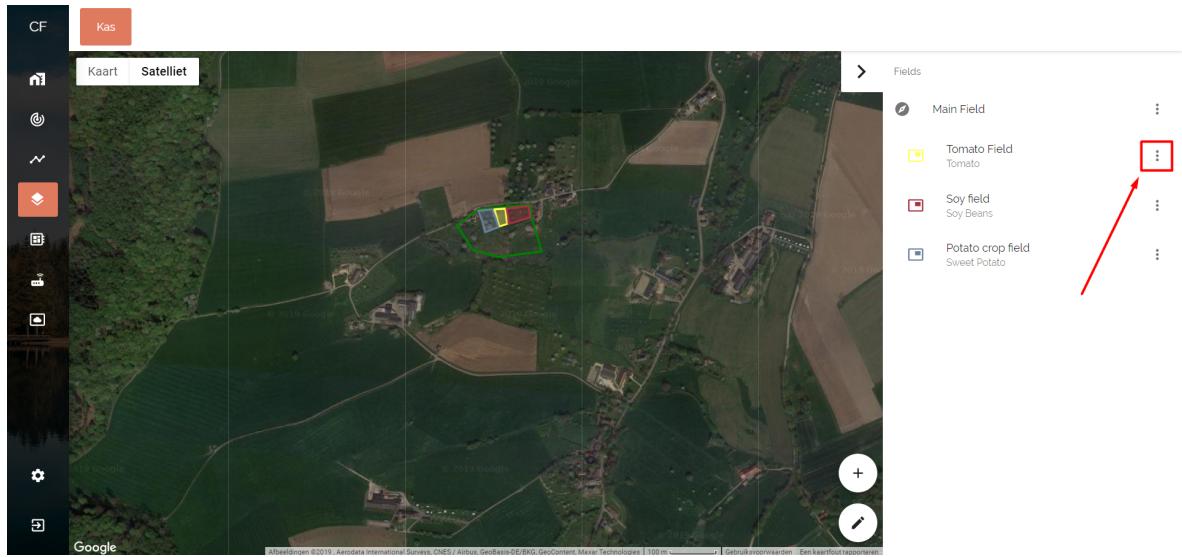


Figure 25: Show field options.

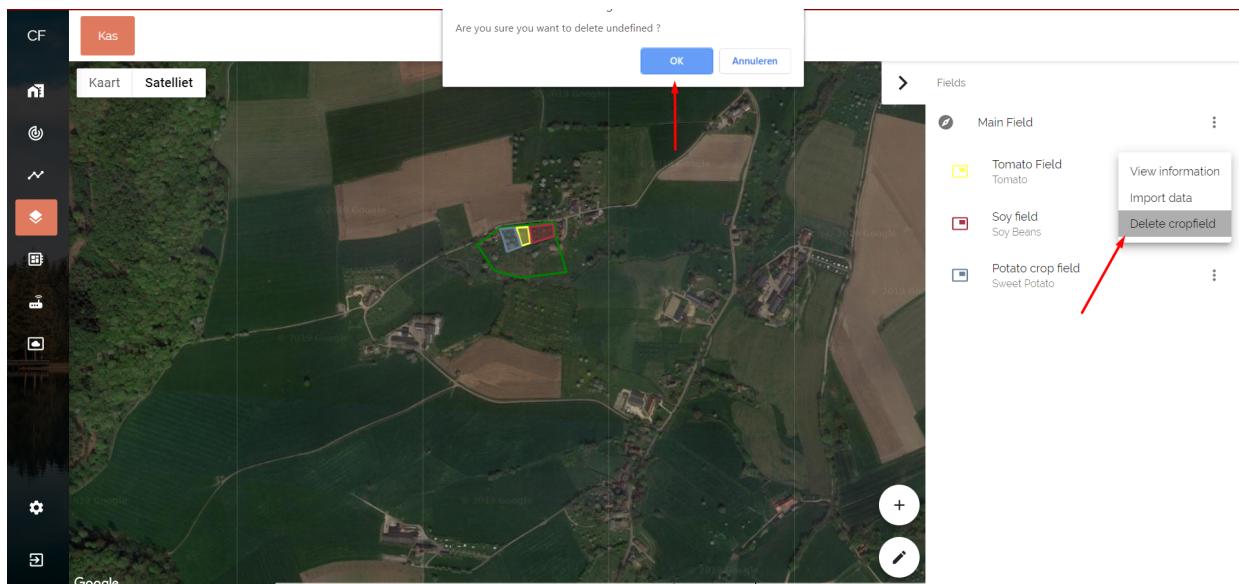


Figure 26: Delete field.

3.5.4 Locate a field/crop field

Functional description: This tutorial describes how a user can locate a field or a crop field on the Fields View.

Preconditions:

- The user is logged in.
- The user is the farm admin, a farmer, a researcher on that farm. Or a general user and the farm data is set to public.
- The user is on the Fields View.

Procedure:

- Navigate to the list in the Fields View see figure 27.
- Click the desired list item, the map refocuses on the desired field/crop field see figure 28.

Likely errors: None.

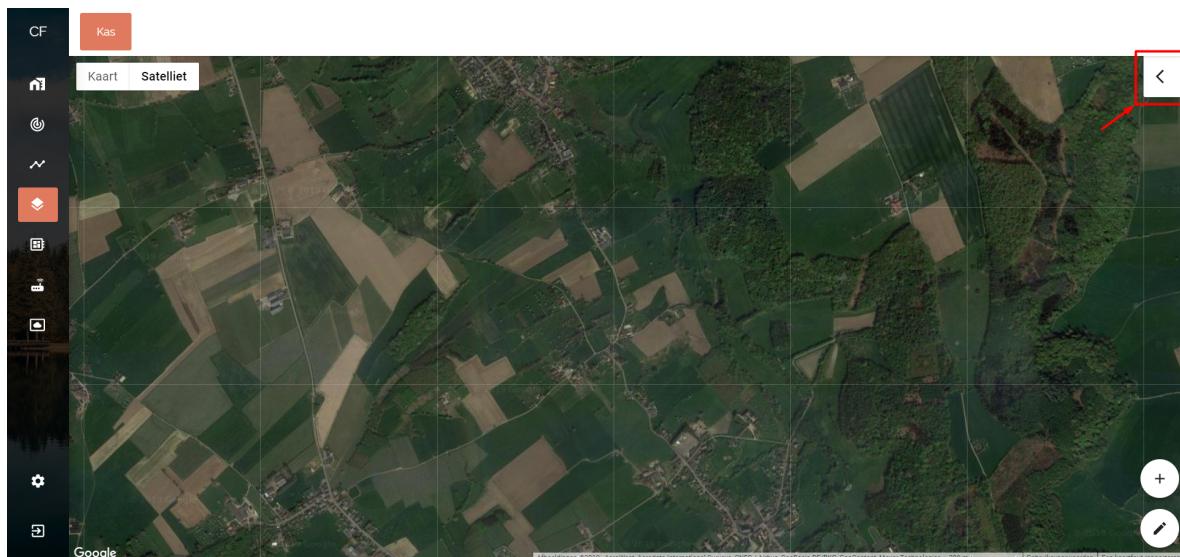


Figure 27: Open fields list.

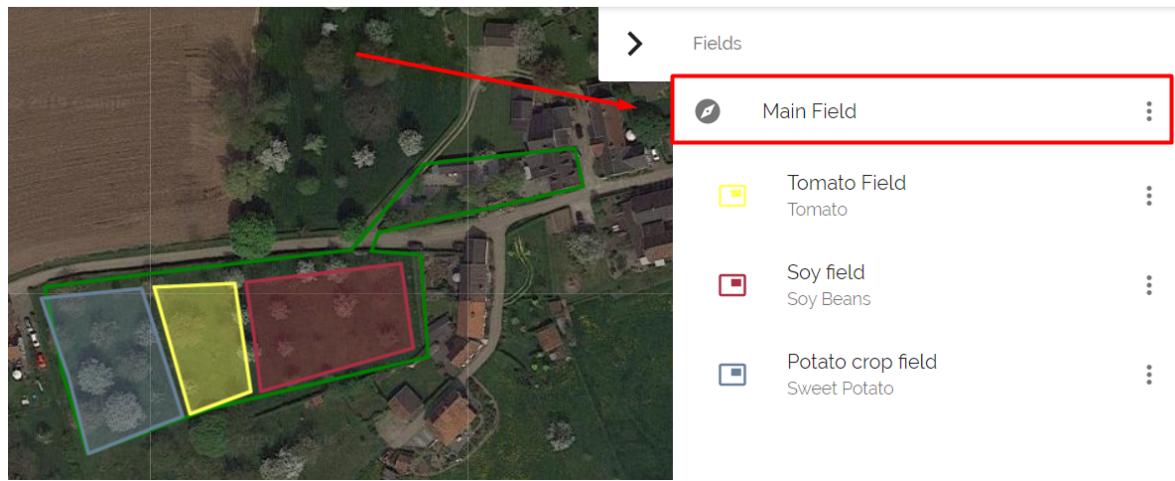


Figure 28: Select field to locate.

3.5.5 Get field/ crop field information

Functional description: This tutorial describes how a user can get information about a certain field or crop field.

Preconditions:

- The user is logged in.
- The user is the farm admin, a farmer, a researcher on that farm. Or a general user and the farm data is set to public.
- The user is on the Fields View.

Procedure:

- Navigate to the list in the Fields View see figure 29.
- Click on the three dots next to the name of the desired field/ crop field and select view information 30.
- By clicking left of the side bar the side bar will close again and the standard map is visible again.

Likely errors: None.

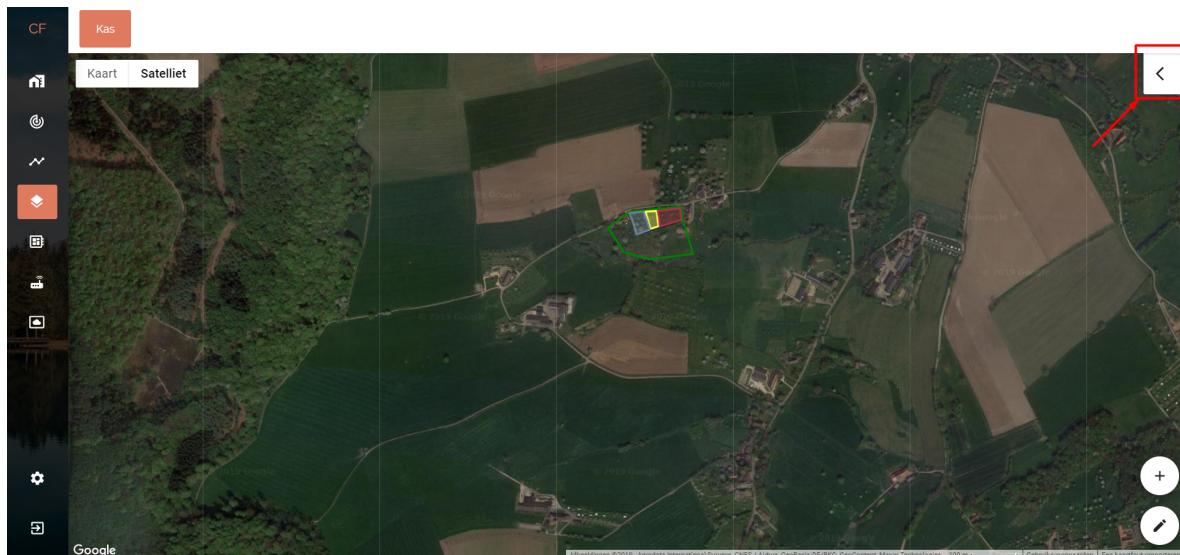


Figure 29: Open fields list.



Figure 30: Click on view field information.

3.5.6 Edit field/crop field data

Functional description: This tutorial describes how a user can change the data of a field or crop field.

Preconditions:

- The user is logged in.
- The user is on the fields view.
- The user is a farm admin or farmer on the selected farm.

Procedure:

- Navigate to the list in the Fields View see figure 29.
- Click the three dots next to the field/crop field that needs to be edited.
- Click the view information option on the drop-down menu.
- Click the pencil icon to open the edit mode see figure 31.
- Change the data that needs to be changed and click on the save button see figure 32.

Likely errors: None.

Cropfield information

 X

Cropfield name: Tomato Field

Croptype: Tomato

Period start: Thu Jan 01 1970 01:00:00 GMT+0100
(Midden-Europese standaardtijd)
Date cropfield was planted

Period end: Thu Aug 19 1971 01:00:00 GMT+0100
(Midden-Europese standaardtijd)
Date cropfield was harvested

Accessibility: public

GPS coordinates of cropfield:

50.765145, 5.907912

50.7648, 5.908072

50.764861, 5.908333

50.765156, 5.908263

Figure 31: The button to edit the data.

Cropfield name *

Tomato Field

Field *

Main Field

Start date

1970/01/01 

End date

1971/08/19 

Crop type *

Tomato

Private  Public

DISCARD **SAVE**



Figure 32: Save edited data.

3.6 Datamaps View

3.6.1 Navigate to the Datamaps View

Functional description: This tutorial describes how an user can navigate to the Datamaps page.

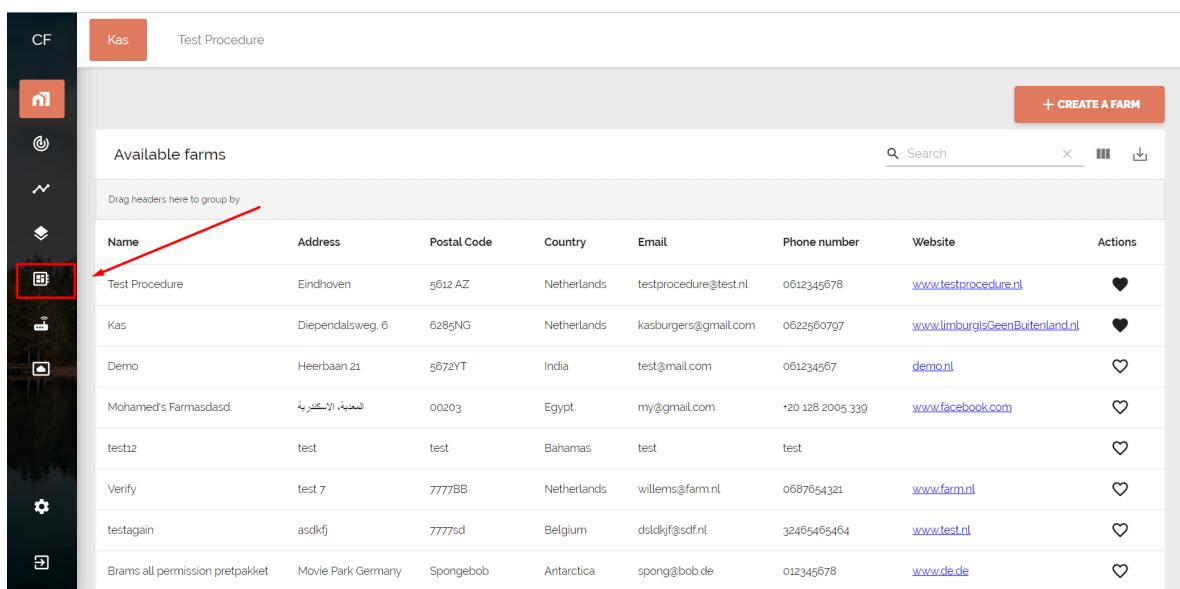
Preconditions:

- The user is logged in.
- The user selected a farm.

Procedure:

- Click the *Datamaps* button in the side bar see Figure 33.

Likely errors: None.



The screenshot shows a web-based application interface for managing farms. On the left is a dark sidebar with various icons: a house (highlighted with a red box and a red arrow pointing to it), a gear, a magnifying glass, a map (highlighted with a red box), and a square. At the top, there are tabs for 'CF' and 'Kas', with 'Kas' being active. The main area has a header 'Test Procedure'. Below the header is a search bar with a magnifying glass icon and a 'CREATE A FARM' button. The main content area is titled 'Available farms' and contains a table with columns: Name, Address, Postal Code, Country, Email, Phone number, Website, and Actions. The table lists several farms, each with a small heart icon in the Actions column. The farms listed are: Test Procedure, Kas, Demo, Mohamed's Farmasdasd, test12, Verify, testagain, and Brams all.permission pretpakket. The 'Actions' column for each row contains a small heart icon.

Name	Address	Postal Code	Country	Email	Phone number	Website	Actions
Test Procedure	Eindhoven	5612 AZ	Netherlands	testprocedure@test.nl	0612345678	www.testprocedure.nl	♥
Kas	Diependalsweg, 6	6285NG	Netherlands	kasburgers@gmail.com	0622560797	www.limburgIsGeenBuitenland.nl	♥
Demo	Heerbaan 21	5672YT	India	test@mail.com	061234567	demo.nl	♥
Mohamed's Farmasdasd	المنجية، الإسكندرية	00203	Egypt	my@gmail.com	+20 128 2005 339	www.facebook.com	♥
test12	test	test	Bahamas	test	test		♥
Verify	test 7	7777BB	Netherlands	willems@farm.nl	0687654321	www.farm.nl	♥
testagain	asdkgfj	7777sd	Belgium	dsldkjf@sdf.nl	32465465464	www.test.nl	♥
Brans all.permission pretpakket	Movie Park Germany	Spongebob	Antarctica	spong@bob.de	012345678	www.de.de	♥

Figure 33: The Datamaps view button.

3.6.2 Upload Datamaps

Functional description: This tutorial describes how an user can upload a datamap to the database.

Preconditions:

- The user is logged in.
- The user selected a farm.
- The user is on the datamaps view.

Procedure:

- Click the + button see Figure 34.
- Fill in the desired values for all the fields, see Figure 35.
- Click the next button.
- Fill in the desired values for all the fields see Figure 36.
- Click the finish button.

Likely errors: The user does not specify the Type see Figure 35.

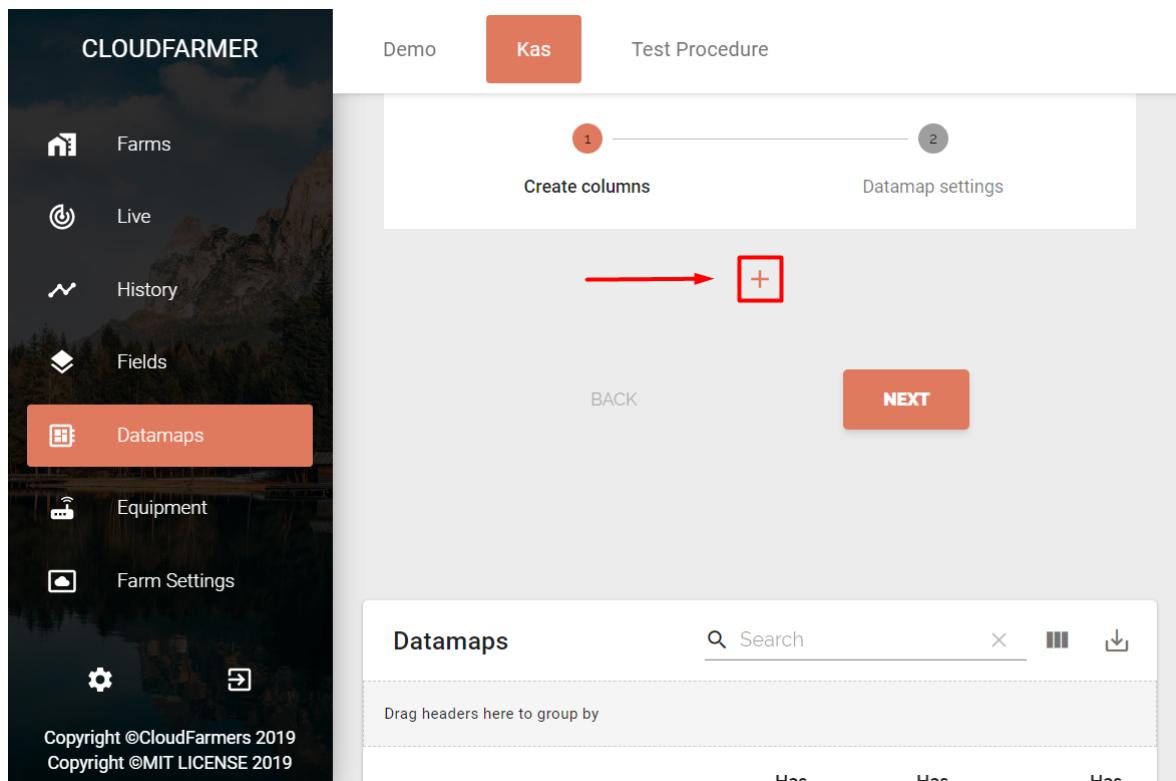


Figure 34: The Datamaps button.

Type	Context *	Parameter *	Unit *	Condition parameter *
		Condition value *		
		0	Condition unit *	

Figure 35: The Datemap information fields.

✓ 2

Create columns Datamap settings

Datamap name *

Description *

Select equipment model *

Additional declarations

has_header has_coordinate has_date
 has_time

Private Public

BACK FINISH

Figure 36: The Datemap description fields.

3.7 Equipment View

3.7.1 Navigate to the Equipment View

Functional description: This tutorial describes how a user can navigate to the Equipment View.

Preconditions:

- The user is logged in.
- The user selected a farm.

Procedure:

- Click the *Equipment* button in the side bar. (See Figure 37)

Likely errors: None.

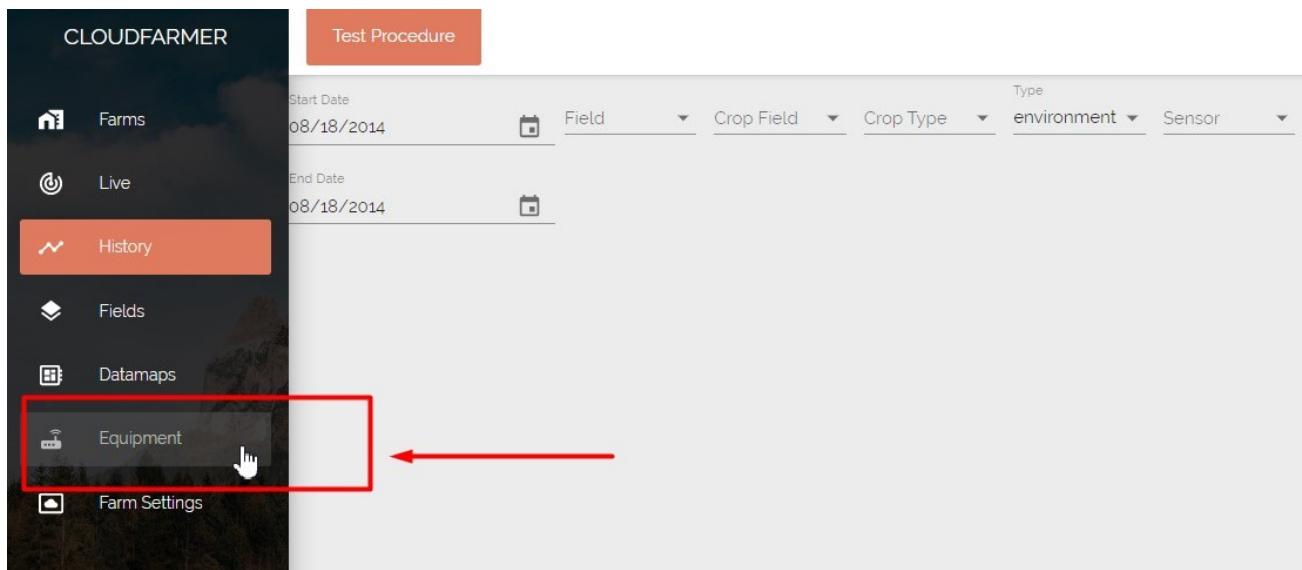


Figure 37: The Equipment view button.

3.7.2 Edit equipment

Functional description: This tutorial describes how a user can edit the equipment data.

Preconditions:

- The user is logged in.
- The user selected a farm.
- User is on the equipment view.
- The user has a farm admin or farmer role on the selected farm.

Procedure:

- Click the edit equipment button see figure 38.
- Edit the data the on the pop-up form.
- Click the save button see figure 39.

Likely errors: None.

The screenshot shows a user interface for managing farm equipment. On the left is a dark sidebar with icons for 'CF', a house, a map, and settings. The main area has a header 'Kas' and a 'CF' logo. Below the header is a search bar and a 'ADD EQUIPMENT' button. The main content is divided into two sections: 'Equipment' and 'Equipment Model'. The 'Equipment' section has a table with columns: Name, Description, Manufacturing date, Serial number, Accessibility, Model Id, and Actions. A single row is shown: 'Kas Burgers' with 'test' in the Description column, '6876354' in the Serial number column, 'private' in the Accessibility column, '19' in the Model Id column, and an 'edit' icon in the Actions column which is highlighted with a red box and a red arrow pointing to it. The 'Equipment Model' section below it has a similar table structure but is currently empty. At the bottom of each section are search, filter, and export buttons.

Figure 38: Edit equipment button.

Edit equipment

Equipment name *

Kas Burgers

Equipment description

test

Equipment model

+ 

Manufacturing date *

31-12-2018

Serial number

6876354

Private Public 

CANCEL  **SAVE**



Figure 39: Equipment form.

3.7.3 Add equipment

Functional description: This tutorial describes how a user can add equipment to the selected farm.

Preconditions:

- The user is logged in.
- The user selected a farm.
- User is on the equipment view.
- The user has a farm admin or farmer role on the selected farm.

Procedure:

- Click the *Add Equipment* button see figure 40.
- Fill in the data in the pop-up dialog form.
- Click the *Add Equipment* button see figure 41.

Likely errors:

- Equipment name is not filled in.
- Equipment description is not filled in.
- Equipment model is not selected.
- Manufacturing date is not selected.
- Serial number is not filled in.
- WolkyTolky API key is not filled in.
- WolkyTolky station id is not filled in.
- Field is not selected.
- Crop field is not selected.

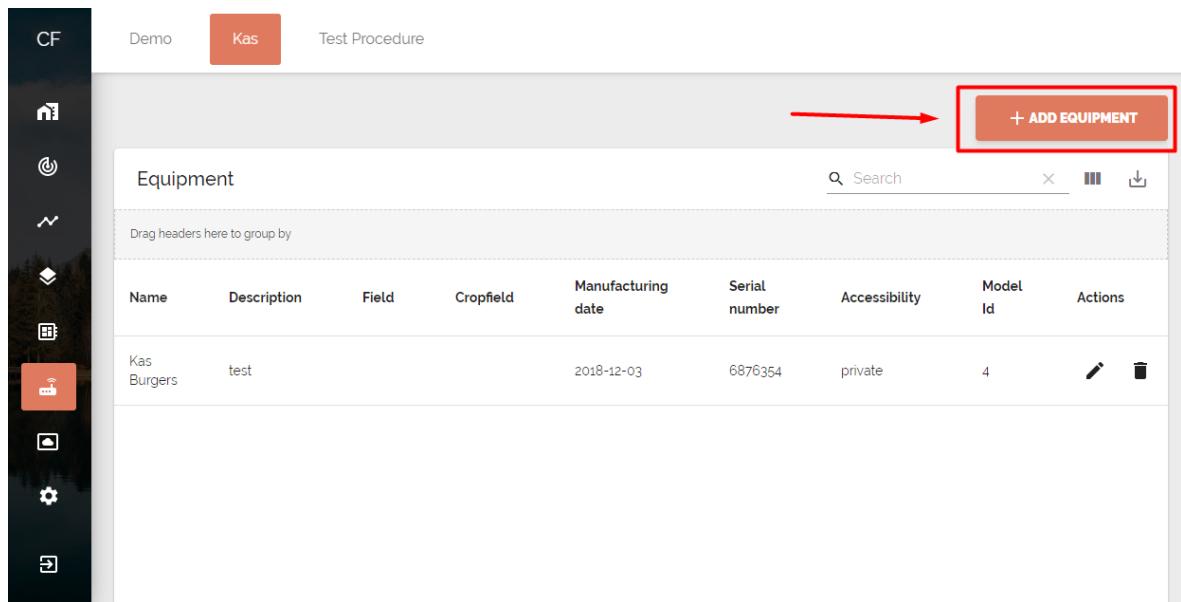


Figure 40: The *Add Equipment* button.

Add new equipment

Equipment name *

Equipment description

Equipment model +

Manufacturing date *
01/01/2019

Serial number

Private Public

WolkyTolky API key

WolkyTolky station id
0

Field

Cropfield

Do you want to store the data of this equipment?

No Yes

CANCEL ADD EQUIPMENT

Figure 41: The Add Equipment dialog form and the *Add Equipment* button.

3.8 Farm Settings View

3.8.1 Navigate to the Farm Settings View

Functional description: This tutorial describes how a user can navigate to the Farm Settings View.

Preconditions:

- The user is logged in.
- The user selected a farm.
- The user is the farm admin.
- The user is not on the Farm Settings View.

Procedure:

- Click the *Farm Settings* button in the side bar. (See Figure 42)

Likely errors: None.

The screenshot shows the CloudFarmer application interface. On the left is a dark sidebar with various icons and labels: Farms (highlighted in orange), Live, History, Fields, Datamaps, Equipment, and Farm Settings (which has a red box around it and a red arrow points to it from below). At the bottom of the sidebar, it says 'Copyright ©CloudFarmers 2019' and 'Copyright ©MIT LICENSE 2019'. The main area has tabs at the top: Demo, Kas (highlighted in orange), and Test Procedure. Below the tabs is a header with '+ CREATE A FARM' and search/filter options. The main content area is titled 'Available farms' and contains a table with the following data:

Name	Address	Postal Code	Country	Email	Phone number	Website	Actions
Test Procedure	Eindhoven	5612 AZ	Netherlands	testprocedure@test.nl	0612345678	www.testprocedure.nl	Heart
Kas	Diependalsweg 6	6285NG	Netherlands	kasburgers@gmail.com	0622560797	www.limburgIsGeenBuitenland.nl	Heart
Demo	Heerbaan 21	5672YT	India	test@mail.com	061234567	demo.nl	Heart
Mohamed's Farmasdasd	المندرة، الإسكندرية	00203	Egypt	my@gmail.com	+20 128 2005 339	www.facebook.com	Heart

Figure 42: The Farm Settings view button.

3.8.2 Edit farm information

Functional description: This tutorial describes how an admin can edit their farm information.

Preconditions:

- The user is logged in.
- The user selected a farm.
- The user is the admin of the selected farm.
- The user is on the Farm Settings View.

Procedure:

- User navigates to the information field they want to update its information.
- Type the new information and/or select the new information from the drop-down menus.
- Click the *Save Changes* button to save the new changes. (See figure 43)

Likely errors: Not all farm information is filled in.

The screenshot shows a form for editing farm information. It includes fields for Farm name, Address, Email, Phone number, Website, and Country. There is also a toggle switch for Privacy settings between 'Private' and 'Public'. At the bottom, there are three buttons: 'DISCARD', 'DELETE FARM', and a large red-bordered 'SAVE CHANGES' button. A red arrow points from the text in the previous section to this 'SAVE CHANGES' button.

Farm name *	Test Procedure		
Address *	Eindhoven	Postal code *	5612 AZ
Email *	testprocedure@test.nl		
Phone number *	0612345679		
Website *	www.testprocedure.nl		
Country *	Germany		
Private	<input checked="" type="checkbox"/>	Public	
DISCARD	DELETE FARM	SAVE CHANGES	

Figure 43: The Farm Settings Save button.

3.8.3 Edit user roles on the farm

Functional description: This tutorial describes how an admin can change the roles other users have to their farm.

Preconditions:

- The user is logged in.
- The user selected a farm.
- The user is the admin of the farm.
- The user is on the Farm Settings View.

Procedure:

- Navigate to the User Management table.
- For the wanted user, click the edit button associated with them. (See figure 44)
- For the wanted user, select the desired new role for them from the drop-down menu under the *Role* column in the table. (See figure 45)
- To save changes, click the “✓” icon under the *Actions* column. To cancel the changes, click the “✗” icon.

Likely errors: None.

User management table		
Actions	Email	Role
	hoi@hoi.nl	farm_admin
		

Figure 44: The user management table edit button.

User management table		
Actions	Email	Role
 	hoi@hoi.nl	
		

Figure 45: The user role drop-down menu.

3.8.4 Add a user to the farm

Functional description: This tutorial describes how an admin can add other users to their farm.

Preconditions:

- The user is logged in.
- The user selected a farm.
- The user is the admin of the farm.
- The user is on the Farm Settings View.

Procedure:

- Navigate to the User Management table.
- Click the table's add button see figure 46.
- Enter an email and a role for the new user.
- To save changes, click the “✓” icon under the *Actions* column. To cancel the changes, click the “✗” icon.

Likely errors: None.



Figure 46: The user management table add button.

3.9 Personal Settings View

3.9.1 Edit Personal Settings

Functional description: This tutorial shows how a user can change the settings of his/her personal account.

Preconditions: User is logged in.

Procedure:

- Navigate to the Personal Settings view by clicking the gear icon. (See Figure 47)
- To change a setting fill in the new information into the corresponding field and fill in the password used for login into both the *password* and *confirm password* fields.
- To change your password you need to fill in your new password in both the *password* and *confirm password* fields.

Likely errors:

- User does not fill in the first/last name.
- User does not fill in the email address. In the right format.
- User does not fill in the password.
- User does not fill in a password of at least 5 characters.
- The filled in passwords do not match.
- The user fills in an email which is already existing.

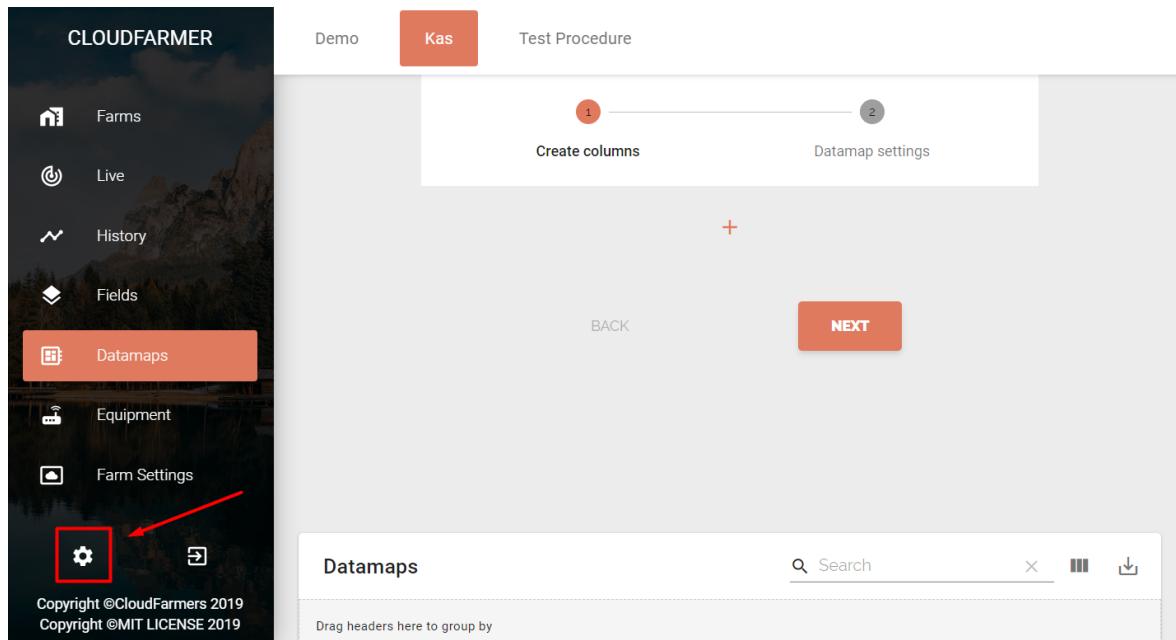
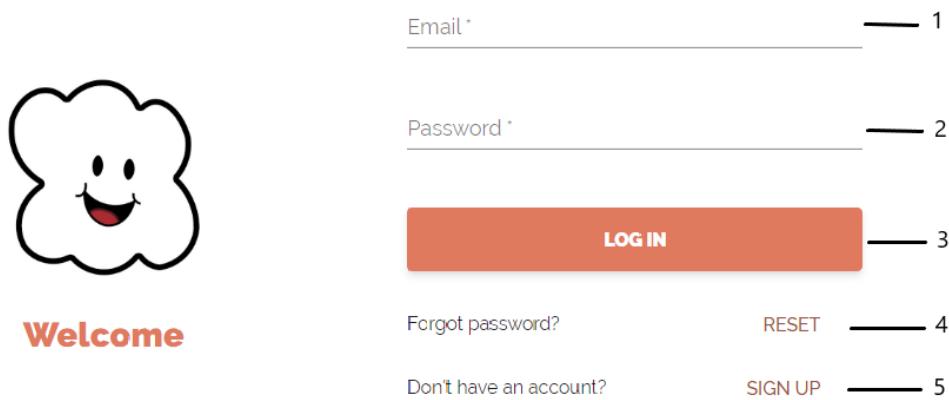


Figure 47: The gear icon which redirects to the personal settings view.

4 Reference

4.1 Login view

Functional description: This page allows users to log in to CloudFarmer, reset their password, or head to the registration page.



The image shows the CloudFarmer login page. A large, stylized white cloud with a smiling face is on the left. The page has a light blue background. At the top, there is a navigation bar with icons for Home, Support, and Log In. Below the navigation, the word "Welcome" is displayed in red. The main form area contains fields for "Email" and "Password", both with asterisks indicating they are required. Below these fields is a large orange "LOG IN" button. To the right of the "LOG IN" button are two links: "Forgot password?" and "RESET". At the bottom of the form are two more links: "Don't have an account?" and "SIGN UP". Callouts numbered 1 through 5 point to specific elements: 1 points to the "Email" field, 2 points to the "Password" field, 3 points to the "LOG IN" button, 4 points to the "Forgot password?" link, and 5 points to the "SIGN UP" link.

Figure 48: Login reference page.

Formal description

Operation	Description	Result
1 Set Email	Enter the account's email into the <i>Email</i> field	The Email is filled in
2 Set password	Enter the account's password into the <i>Password</i> field	The password is filled in
3 Log in	Click the <i>Log in</i> button	The user is logged in with the filled in credentials
4 Go to the Reset Password page	Click the <i>Reset</i> button	The user is redirected to The Forgot password page
5 Go to the Sign Up page	Click the <i>Sign Up</i> button	The user is redirected to The Registration page

4.2 Create an account

Functional description: This page allows users to sign up for CloudFarmer.

The diagram shows a user interface for creating a new account. On the left, there is a white, fluffy cloud-like icon with a smiling face. To its right, the text "Create a new account" is displayed in a red, bold font. The form itself consists of several input fields and buttons. A horizontal line labeled "1" connects the "First name *" field to the "Last name *" field. A line labeled "2" connects the "Last name *" field to the "Email *" field. A line labeled "3" connects the "Email *" field to the "Password *" field. A line labeled "4" connects the "Password *" field to the "Confirm password *" field. A line labeled "5" connects the "Confirm password *" field to the "SIGN UP" button. A line labeled "6" connects the "SIGN UP" button to the "CANCEL" link. A line labeled "7" connects the "CANCEL" link back to the "First name *" field. The "SIGN UP" button is highlighted with a red background and white text.

1

First name * Last name *

2

Email *

3

Password *

4

Confirm password *

5

CANCEL

SIGN UP

6

7

Figure 49: Create account reference page.

Formal description

Operation	Description	Result
1 Fill in first name	Enter the desired first name of the user into the <i>First Name</i> field	The first name is filled in
2 Fill in last name	Enter the desired last name of the user into the <i>Last Name</i> field	The last name is filled in
3 Fill in email	Enter the desired email of the user into the <i>Email</i> field	Email is filled in
4 Fill in password	Enter an account's desired Password into the <i>Password</i> field	The password name is filled in
5 Fill in confirm password	Enter an account's desired Password into the <i>Confirm Password</i> field to confirm the desired password	The password confirmation is filled in
6 Sign Up	Click the <i>Sign Up</i> button	An account with the specified credentials is created
7 Cancel the registration	Click the <i>Cancel</i> button	The creating of an account is cancelled

4.3 Reset Password

Functional description: This page allows users to request a new password for their account on CloudFarmer.

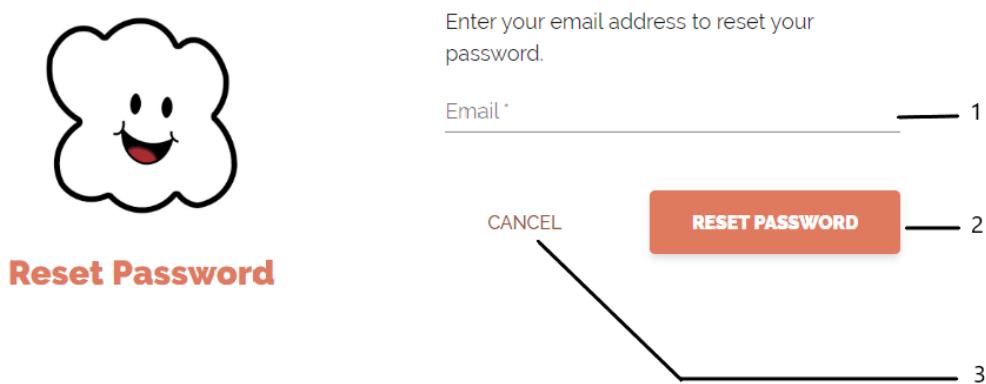


Figure 50: Reset password reference page.

Formal description

Operation	Description	Result
1 Fill in email	Enter the email into the <i>Email</i> field of the Account which password needs to be reset	Email is filled in
2 Reset Password	Click the <i>Reset</i> button	A password reset is requested
3 Cancel the registration	Click the <i>Cancel</i> button	The creating of an account is cancelled

4.4 Sidebar

Functional description: The sidebar contains the buttons which direct the user to their desired view.

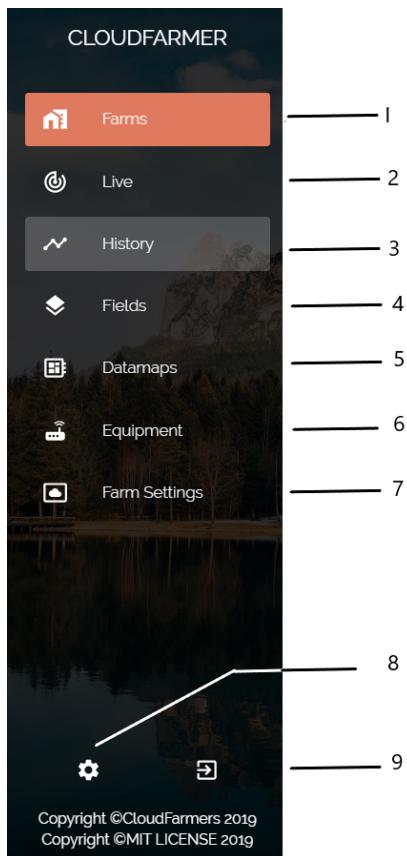


Figure 51: Sidebar reference page.

Formal description

Operation	Description	Result
1 Navigate to Home	Click the <i>Farms</i> button	The user is redirected to the Farms view
2 Navigate to Live	Click the <i>Live</i> button	The user is redirected to the Live view
3 Navigate to History	Click the <i>History</i> button	The user is redirected to the Farms History
4 Navigate to Fields	Click the <i>Fields</i> button	The user is redirected to the Fields view
5 Navigate to Datamaps	Click the <i>Datamaps</i> button	The user is redirected to the Datamaps view
6 Navigate to Equipment	Click the <i>Equipment</i> button	The user is redirected to the Equipment view
7 Navigate to History	Click the <i>History</i> button	The user is redirected to the History view
8 Navigate to Personal Settings	Click the <i>cogwheel</i> button	The user is redirected to the Personal settings view
9 Log out	Click the <i>Logout</i> button	The user is logged out and redirected to the login page

4.5 Equipment View

4.5.1 Equipment list

Functional description: In this part of the view, the user is provided with a list of the equipment of the selected farm. The attributes of the equipment shown in that list are the *Name*, *Description*, *Manufacturing date*, *Serial number*, *Accessibility* and *Model id*. The user can select which attributes are displayed. The user can perform other actions as well including, but not limited to, adding a new equipment piece, deleting equipment, editing equipment information and exporting those them as a CSV list.

The screenshot shows a table titled 'Equipment' with columns: Name, Description, Manufacturing date, Serial number, Accessibility, Model Id, and Actions. A single row is visible with data: Kas Burgers, test, 2018-12-03, 6876354, private, 4. The 'Actions' column contains icons for edit (pencil), delete (trashcan), and export (down arrow). The top right features a search bar with a magnifying glass icon, a clear button (X), and a download icon. A red '+' button labeled '+ ADD EQUIPMENT' is at the top right. Callouts numbered 1 through 6 point to various elements: 1 points to the '+ ADD EQUIPMENT' button; 2 points to the search bar; 3 points to the download icon; 4 points to the edit icon in the 'Actions' column; 5 points to the delete icon in the 'Actions' column; 6 points to the export icon in the 'Actions' column. Navigation buttons at the bottom include '5 rows', '<', '< 1-1 of 1 >', and '>'.

Name ↑	Description	Manufacturing date	Serial number	Accessibility	Model Id	Actions
Kas Burgers	test	2018-12-03	6876354	private	4	

Figure 52: Equipment on equipment view.

Formal description

Operation	Description	Result
1 Add equipment	Click the <i>Add Equipment</i> button	The dialog for adding equipment appears
2 Export equipment list	Click the <i>Export</i> icon	The equipment list is downloaded as a CSV file
3 Select the equipment attributes to be displayed	Click the <i>Show Columns</i> icon	The column menu is displayed (analogous to the column menu in the Farms View).
4 Filter equipment	Enter a search string	Equipment that have a property containing the search string are filtered
5 Delete equipment	Click the trashcan icon	Equipment piece gets deleted
6 Edit equipment	Click the edit icon and fill in the values for the equipment attributes	Equipment information gets updated

4.5.2 Equipment Model list

Functional description: In this part of the view, the user is provided with a list of the equipment models of the selected farm. The attributes of the equipment shown in that list are the *Brand*, *Model*, *Model year*, *Series*, *Software version*, *Description* and *Model id*. The user can select which attributes are displayed and filter the equipment models based on those attributes.

Equipment Model						
<input type="text"/> Search X ☰ Download						
Drag headers here to group by						
Brand	Model	Model year	Series	Software version	Description	Model Id
sadf	asdf	1234	asjkdf	lsadkjf	dfaaf	2
Merk	Model	4568	Serie	Software	beschrijving	4
Sensor Brand	New model	2018	From the new series	1.0	Great sensor!	6
sdf	sdf	2019				7
High model year	High	2035				8

5 rows |< < 1-5 of 17 > |> — 4 — 5

Figure 53: Equipment model on equipment view.

Formal description:

Operation	Description	Result
1 Export equipment model list	Click the <i>Export</i> icon	The equipment model list is downloaded as a CSV file
2 Select the equipment model attributes to be displayed	Click the <i>Show Columns</i> icon	The column menu is displayed (analogous to the column menu in the Farms View)
3 Filter equipment models	Enter a search string	Equipment that have a property containing the search string are filtered
4 Select the number of rows in the list	Click the downward arrow-head and select the number of rows desired	The selected number of rows is displayed
5 Navigate to the next page in the list	Click the arrow pointing to the right	The next page in the equipment model list is displayed

4.5.3 Add equipment dialog

Functional description: This dialog appears when the user opts to add a new equipment piece to the selected farm. This dialog contains the information that the user should fill to add the new equipment piece.

The screenshot shows the 'Add new equipment' dialog with various input fields and controls. A series of black numbers from 1 to 14 are overlaid on the interface to identify specific elements:

- 1: Equipment name input field
- 2: Equipment description input field
- 3: Equipment model input field with a red '+' button
- 4: Manufacturing date input field
- 5: Manufacturing date value ('01-01-2019')
- 6: Serial number input field
- 7: Privacy toggle switch (Private/Public)
- 8: WolkyTolky API key input field
- 9: WolkyTolky station id input field
- 10: Field dropdown menu
- 11: Cropfield dropdown menu
- 12: Storage preference toggle switch (No/Yes)
- 13: Storage preference value ('Yes')
- 14: ADD EQUIPMENT button
- 15: CANCEL button

Figure 54: Add equipment.

Formal description

	Operation	Description	Result
1	Set equipment name	Fill in the equipment name	The equipment name is filled in
2	Set equipment description	Fill in the equipment description	The equipment description is filled in
3	Assign a new equipment model to the equipment piece	Click the plus icon encapsulated in the orange box	The user is directed to the equipment model dialog
4	Assign an existing equipment model to the equipment piece	Click the drop-down button and select the desired equipment model	The equipment model is filled in
5	Set the manufacturing date	Fill in the date	The manufacturing date is filled in
6	Set the serial number	Fill in the serial number	The serial number is filled in
7	Set the equipment's accessibility	Click the accessibility switch	The equipment's accessibility is displayed
8	Set the equipment's WolkyTolky API key	Enter the API key	The API key is filled in
9	Set the WolkyTolky station id	Fill in the station id	The station id is set
10	Set the field to which the equipment belongs	Click the field drop-down button and select the desired field	The field is set
11	Set the crop field to which the equipment belongs	Click the crop field drop-down button and select the desired crop field	The crop field is set
12	Enable/disable data storage	Click the toggle associated with data storage	The preferred data storage option is set
13	Cancel equipment addition	Click the <i>Cancel</i> button	The equipment piece is not added
14	Confirm equipment addition	Click on the <i>Add equipment</i> button	The equipment piece is added

4.5.4 Add equipment model dialog

Functional description: This dialog appears when the user opts to add a new equipment model to the selected farm. This dialog contains the information that the user should fill to add that new equipment model.

Add new equipment model

Brand name *

Model *

Model year *

2019

Series

Software version

Description

CANCEL

ADD MODEL

Figure 55: Equipment model on equipment view.

Formal description

	Operation	Description	Result
1	Set the equipment model's brand	Fill in the brand name	The brand name is filled in
2	Set equipment model name	Fill in the model name	The equipment model name is filled in
3	Set equipment model year	Fill in the model year	The equipment model year is filled in
4	Set equipment model series	Fill in the series	The equipment model series is filled in
5	Set equipment model software version	Fill in the software version	The equipment model software version
6	Set equipment model description	Fill in the description	The equipment model description is filled in
7	Cancel equipment model addition	Click the <i>Cancel</i> button	The equipment model addition is cancelled
8	Confirm equipment model addition	Click the <i>Add Model</i> button	The equipment piece is added

4.6 Farms View

Functional description: This view provides the user with a list of the farms available on CloudFarmer's database. The attributes of the farms shown in that list are the *Name*, *Address*, *Postal Code*, *Country*, *Email*, *Phone number* and *Website*. The user can select which attributes are displayed. The user can perform other actions as well including, but not limited to, creating a new farm, grouping farms and exporting those farms as a CSV list.

The screenshot shows a web-based application interface for managing farms. At the top right is a red button labeled '+ CREATE A FARM' (1). Below it is a search bar with a magnifying glass icon (2) and a clear 'X' button (3). To the right of the search bar are three icons: a grid (4), a download (5), and a refresh (6). A grey header bar contains the text 'Available farms' (7). Below the header is a section titled 'Drag headers here to group by'. The main content area displays a table of farms with the following columns: Name, Address, Postal Code, Country, Email, Phone number, Website, and Actions. The table lists four farms: Kas, Demo, Mohamed's Farmsasd, and test12. Each row has a set of icons in the Actions column: a heart (6), a list (7), and another heart (7). The entire interface is styled with a light grey background and white text.

Name	Address	Postal Code	Country	Email	Phone number	Website	Actions
Kas	Diependalsweg 6	6285NG	Netherlands	kasburgers@gmail.com	0622560797	www.limburgIsGeenBuiteland.nl	
Demo	Heerbaan 21	5672YT	India	test@mail.com	061234567	demo.nl	
Mohamed's Farmsasd	المدنية، الإسكندرية	00203	Egypt	my@gmail.com	+20 128 2005 339	www.facebook.com	
test12	test	test	Bahamas	test	test		

Figure 56: Farm reference page.

Formal description

Operation	Description	Result
1 Create a new farm	Click the <i>Create A Farm</i> button	The farm creation dialog is displayed
2 Select the farm attributes to be displayed	Click the <i>Show Columns</i> icon	The column menu is displayed
3 Export the farms list as CSV file	Click the <i>Export</i> icon	The farms list and their details are downloaded as a CSV file
4 Filter farms	Enter a search string	Farms that have a property containing the search string are filtered
5 Group farms	Drag a column header to the grey bar	Farms get grouped by the selected header.
6 Deselect a farm	Click the associated with the farm	The farm's tab is removed from the top bar
7 Select a farm	Click the associated with the farm	The farm's tab is add to the top bar

4.6.1 Farm creation dialog

Functional description: This dialog contains the information that the user has to fill in after they clicked on the *Create A Farm* button.

The image shows a 'Create a new farm' dialog box. It contains the following fields and controls, each labeled with a number:

- Farm name * (text input) - 1
- (Address input) - 2
- (Postal code input) - 3
- Email * (text input) - 4
- Phone number * (text input) - 5
- Website * (text input) - 6
- Country * (dropdown menu) - 7
- Private (radio button) - 8
- Public (radio button) - 9
- CANCEL (button) - 10
- CREATE NEW FARM (button)

A large black arrow points from the 'Address' field (2) towards the 'Postal code' field (3). Another large black arrow points from the 'CANCEL' button (10) towards the 'CREATE NEW FARM' button.

Figure 57: Farm creation dialog.

Formal description

	Operation	Description	Result
1	Set the farm name	Enter the farm name	The farm name is filled in
2	Set the farm's address	Enter the address	The address is filled in
3	Set the farm's postal code	Enter the postal code	The postal code is filled in
4	Set the farm's email address	Enter the email address	The email address is filled in
5	Set the farm's phone number	Enter the phone number	The phone number is filled in
6	Set the farm's website	Enter the website	The website is filled in
7	Set the farm's country	Select the country from the dropdown menu	The country is selected
8	Set the farm's accessibility	Click the accessibility switch	The farm's accessibility is set
9	Cancel farm creation	Click the <i>Cancel</i> button	The farm creation is cancelled
10	Confirm farm creation	Click the <i>Create New Farm</i> button	The farm is created

4.6.2 Farm Column Menu

Functional description: This menu contains the list of farm attributes that are displayed in the farms list. The user can check or uncheck the attributes shown in that menu to control the format of the farms list.

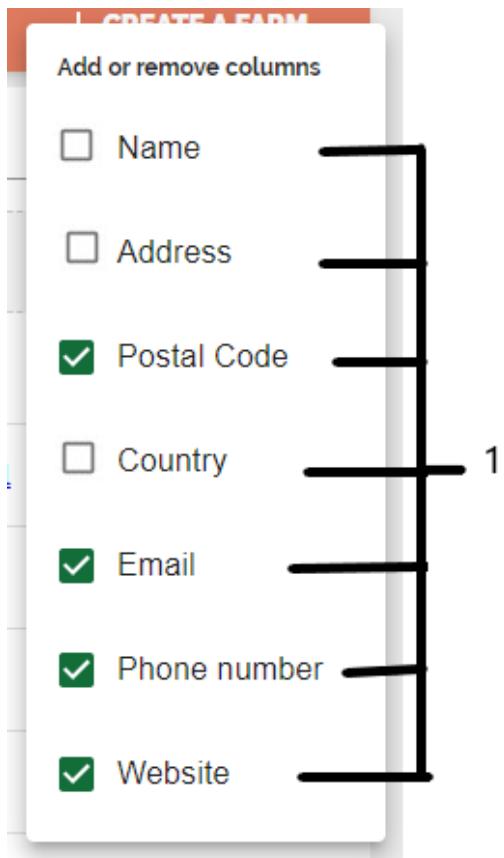


Figure 58: The farm column menu.

Formal description

Operation	Description	Result
1 Show the ticked column headers	Click the desired check boxes	Only the ticked column headers are shown in the farms list

4.7 Farm Settings View

4.7.1 Farm Settings

Functional description: This part of the Farm Settings View allows the farm admin to alter the information of their farm.

The form consists of several input fields and a toggle switch. Annotations numbered 1 through 11 point to specific elements: 1. Farm name field ('Kas'); 2. Address field ('Diependalsweg, 6') and Postal code field ('6285NG'); 3. Email field ('kasburgers@gmail.com'); 4. Phone number field ('0622560797'); 5. Website field ('www.limburgIsGeenBuitenland.nl'); 6. Country dropdown ('Netherlands'); 7. A dropdown menu; 8. A toggle switch between 'Private' and 'Public'; 9. The 'Public' label; 10. The 'SAVE CHANGES' button; 11. The 'DISCARD' button.

Farm name *	Kas	1
Address *	Diependalsweg, 6	2
Email *	kasburgers@gmail.com	3
Phone number *	0622560797	4
Website *	www.limburgIsGeenBuitenland.nl	5
Country *	Netherlands	6
Private	Public	7
DISCARD	DELETE FARM	8
		9
	SAVE CHANGES	10
		11

Figure 59: Farm settings.

Formal description

	Operation	Description	Result
1	Set the farm name	Fill in the new farm name	The new farm name is filled in
2	Set the farm postal code	Fill in the new postal code	The new postal code is filled in
3	Set the farm address	Fill in the new farm address	The new farm address is filled in
4	Set the farm email	Fill in the new email	The new email is filled in
5	Set the farm phone number	Fill in the new phone number	The new phone number is filled in
6	Set the farm website	Fill in the new website	The new website is filled in
7	Set the farm country	Select the new country from the dropdown menu	The country is selected
8	Set the farm accessibility	Click the accessibility switch	The farm accessibility is filled in
9	Discard the farm settings changes	Click the <i>Discard</i> button	The farm settings changes are not saved
10	Save the farm settings changes	Click the <i>Save Changes</i> button	The farm settings changes are saved
11	Delete the farm	Click the <i>Delete Farm</i> button	The farm is deleted

4.7.2 User Management Table

Functional description: This part of the Farm Settings View displays the users associated with the farm admin's farm. Those users might be general users, researchers, farmers or other farm admins. This table allows the farm admin to add new users to the farm as well as edit the information of the current ones.



Figure 60: Farm settings User Management Table.

Formal description

Operation	Description	Result
1 Add a new user to the farm	Click the add icon and enter the user's email and role	The new user is added
2 Filter users	Enter a search string	Users with an email or a role that contains the entered string are filtered
3 Edit users email and/or role	Click the edit icon associated with the user and enter the new email address and select the new role	The new user email and role are set

4.8 Fields View

4.8.1 Fields Display

Functional description: In this part of the Fields View, the fields and crop fields pertaining to the selected farm are illustrated. The fields and their associated crop fields can be seen via a map view or a satellite view. The functionalities offered in both views are the identical. The functionalities entail viewing and editing field/crop field information as well as deleting and creating new ones.



Figure 61: Satellite View.

Formal description:

Operation	Description	Result
1 Expand the fields view list	Click the arrow	The fields view list is displayed
2 Switch between the Map and Satellite viewing modes	Click the desired viewing mode	The map is displayed in the desired manner
3 View field/crop field information	Click the field/crop field information	The field/crop field information dialog is displayed
4 Add a new field/crop field	Click the add icon	The new field/crop field creation dialog is displayed
5 Edit field/crop field border	Click the edit icon and drag the field/crop field borders	The field/crop field borders are redefined

4.8.2 Fields View List

Functional description: This list displays all fields and crop fields of the selected farm(s). The list allows the user to view, edit and delete field and crop field information.

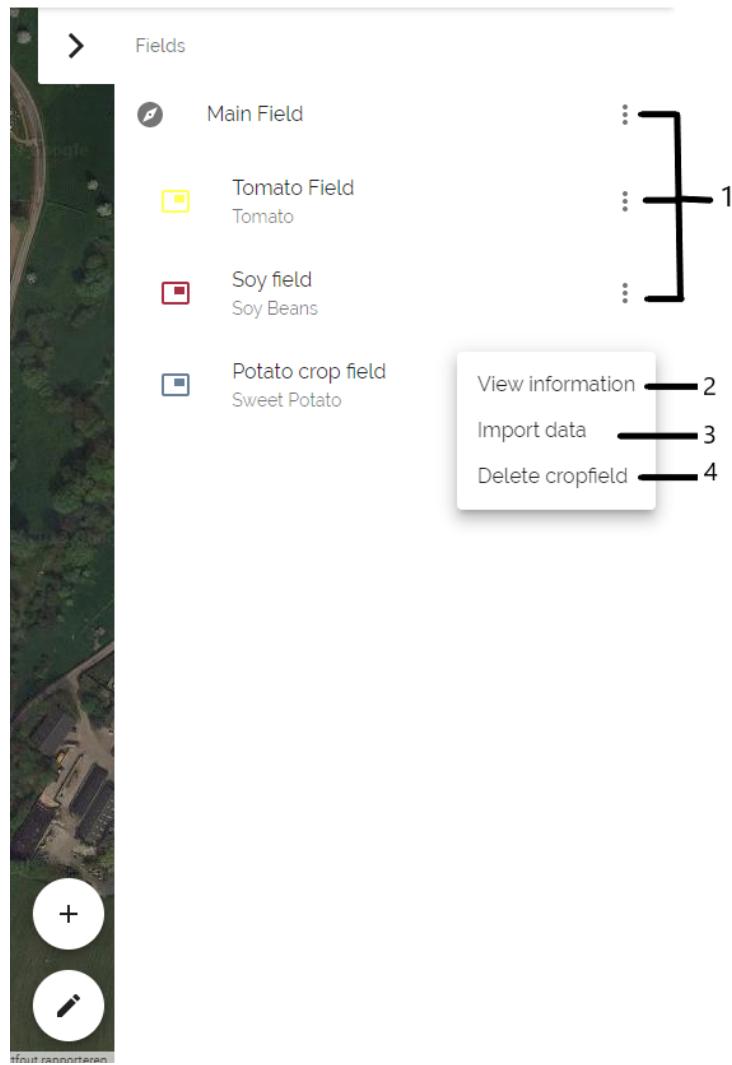


Figure 62: Fields View List

Formal description

Operation	Description	Result
1 Open the options of a field or crop field	Click the 3 dots	The option menu opens
2 View information	Click the <i>View information</i> button	The information drawer of the selected field/ crop field is displayed
3 Import data	Click the <i>Import data</i> button	<i>This feature has not been implemented.</i>
4 Delete the field or crop field	Click the <i>Delete field</i> or <i>Delete crop field</i> button	The field/ crop field gets deleted

4.8.3 Fields creation dialogs

Functional description: This dialog pops up after a perimeter has been defined by the user in the map or satellite view. It allows the user to define the type of the parameter (field or crop field) as well as filling in its details.

The figure shows the 'Field Creation Dialog' interface. At the top, a header reads 'Choose what kind of field you want to create'. Below it is a toggle switch between 'Cropfield' (selected, indicated by a green circle) and 'Field' (indicated by a grey circle). Step 1 is labeled '1' next to the 'Field' option. The next section contains a text input field labeled 'Field name *' (step 2), a dropdown menu labeled 'Soil type *' (step 3), and a toggle switch between 'Private' (selected, green circle) and 'Public' (grey circle) (step 4). Step 5 is a large, diagonal line connecting the bottom of step 4 to the 'SAVE' button. Step 6 is labeled '6' next to the 'SAVE' button, which is highlighted with a red background and white text. To the left of the 'DISCARD' button, there is a small orange 'X' icon.

Figure 63: Field Creation Dialog.

Formal description

Operation	Description	Result
1 Switch to the crop field creation dialog	Click the switch	The crop field creation dialog is displayed
2 Set the field's name	Enter the field's name	The field name is filled in
3 Set the soil type	Click the Soil Type drop-down button and select the soil type	The soil type is selected
4 Set the field's accessibility	Click the accessibility switch	The field's accessibility is selected
5 Discard field creation	Click the <i>Discard</i> button	The field creation is discarded
6 Confirm field creation	Click the <i>Save</i> button	The field creation is confirmed

4.8.4 Crop Field creation dialog

Functional description: This dialog pops up after a perimeter has been defined by the user in the map or satellite view. It allows the user to define the type of the parameter (field or crop field) as well as filling in its details.

Choose what kind of field you want to create

Cropfield Field 1

Cropfield name * 2

Field * 3

Start date
2019/10/23 4

End date
2019/10/23 5

Crop type * 6

Private Public 7

DISCARD SAVE 8

9

The form consists of several input fields and controls. At the top, there's a toggle switch between 'Cropfield' and 'Field', with 'Field' being selected (indicated by a checked checkbox). Below this is a text input for 'Cropfield name' with a required asterisk. A dropdown menu for 'Field' is shown with 'Field' selected. There are two date inputs: 'Start date' and 'End date', both set to '2019/10/23'. Below the dates is a dropdown for 'Crop type'. Underneath the crop type dropdown is a toggle switch between 'Private' (checked) and 'Public'. At the bottom left is a 'DISCARD' button, and at the bottom center is a large orange 'SAVE' button. A long black horizontal bar spans across the bottom of the form, ending with the number '9' on the far right.

Figure 64: Crop Field Creation Dialog.

Formal description

Operation	Description	Result
1 Switch to the field creation dialog	Click the switch	The field creation dialog is displayed
2 Set the crop field's name	Enter the crop field's name	The crop field name is filled in
3 Set the field to which the crop field will be added	Click the drop-down button and select the desired field	The crop field is added to the selected field
4 Set the crop field's start date	Click the calendar icon and select the desired date	The crop field's starting date is filled in
5 Set the crop field's end date	Click the calendar icon and select the desired date	The crop field's end date is filled in
6 Set the crop type	Click the <i>Crop Type</i> drop-down button and select the crop type	The crop type is selected
7 Set the field's accessibility	Click the accessibility switch	The field's accessibility is selected
8 Discard crop field creation	Click the <i>Discard</i> button	The field creation is discarded
9 Confirm crop field creation	Click the <i>Save</i> button	The crop field creation is confirmed

4.8.5 Selected Field/ Crop Field Information Dialog

Functional description: This dialog pops up when the user selects a field or a crop field in the Fields View list to display their information. It allows the user to navigate to the edit field/ crop field information dialog.

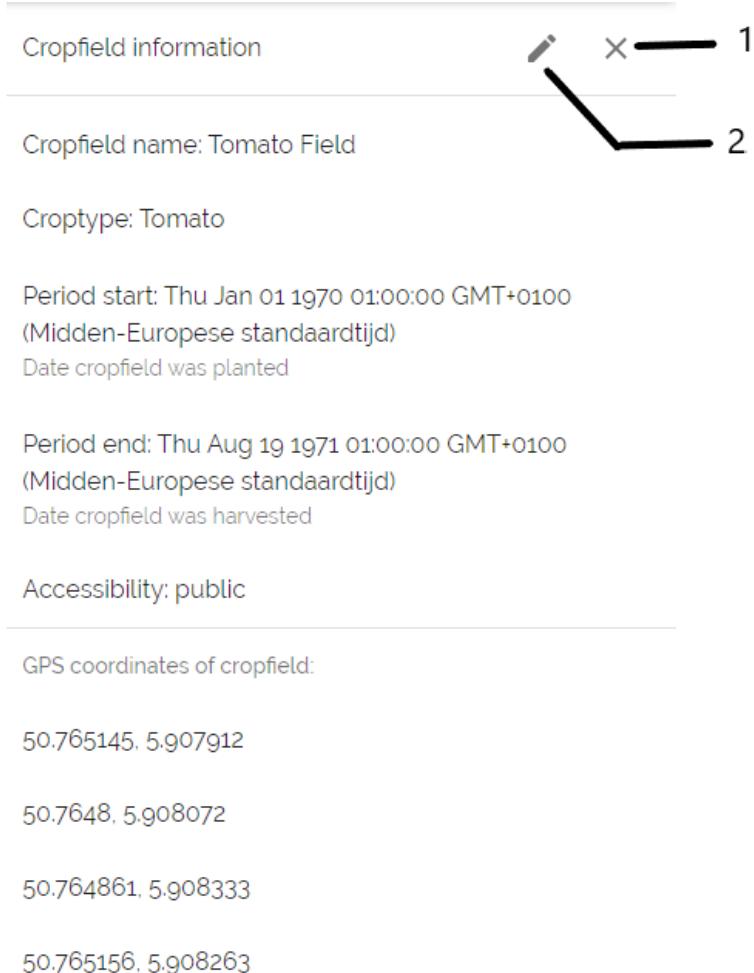


Figure 65: Field/ Crop Field Information Dialog.

Formal description

Operation	Description	Result
1 Close the information dialog	Click the cross icon	The information dialog is closed
2 Edit the information of the selected field/crop field	Click the edit icon	The edit field/crop field information dialog is displayed

4.8.6 Edit Field Information Dialog

Functional description: This dialog appears when the user opts to perform edits regarding field information.

The screenshot shows a dialog box with the following fields and controls:

- Field name ***: A text input field containing "Main Field". A horizontal line labeled "1" extends from the right side of the input field to the right edge of the dialog.
- Soil type ***: A dropdown menu showing "chalk". A horizontal line labeled "2" extends from the right side of the dropdown to the right edge of the dialog.
- Accessibility**: A toggle switch between "Private" (selected) and "Public". A horizontal line labeled "3" extends from the right side of the switch to the right edge of the dialog.
- DISCARD**: A button labeled "DISCARD" in red. A horizontal line labeled "4" extends from the left side of the button to the right edge of the dialog.
- SAVE**: A large orange button labeled "SAVE" in white. A horizontal line labeled "5" extends from the right side of the button to the right edge of the dialog.

Figure 66: Edit field data.

Formal description

Operation	Description	Result
1 Edit the field's name	Enter the field's name	The field name is filled in
2 Edit the soil type	Click on the <i>Soil Type</i> drop-down button and select the soil type	The soil type is edited
3 Edit the field's accessibility	Click the accessibility switch	The field's accessibility is selected
4 Discard field edits	Click the <i>Discard</i> button	The field edits are discarded
5 Save field edits	Click the <i>Save</i> button	The field edits are saved

4.8.7 Edit Crop Field Information Dialog

Functional description: This dialog appears when the user opts to perform edits regarding crop field information.

The screenshot shows a dialog box for editing crop field information. The fields and their corresponding numbers are:

- Cropfield name * (1) - Text input: Tomato Field
- Field * (2) - Select dropdown: Main Field
- Start date (3) - Date input: 1970/01/01 with a calendar icon
- End date (4) - Date input: 1971/08/19 with a calendar icon
- Crop type * (5) - Select dropdown: Tomato
- Private (6) - Toggle switch (green)
- Public (7) - Toggle switch (gray)
- DISCARD (8) - Text button
- SAVE (8) - Orange button with white text

Figure 67: Edit crop field information.

Formal description

	Operation	Description	Result
1	Edit the crop field's name	Enter the crop field's name	The crop field name is filled in
2	Edit the field to which the crop field will be added	Click the drop-down button and select the desired field	The crop field is added to the selected field
3	Edit the crop field's start date	Click the calendar icon and select the desired date	The crop field's starting date is filled in
4	Edit the crop field's end date	Click the calendar icon and select the desired date	The crop field's end date is filled in
5	Edit the crop type	Click the <i>Crop Type</i> drop-down button and select the crop type	The crop type is selected
6	Edit the field's accessibility	Click the accessibility switch	The field's accessibility is selected
7	Discard crop field creation	Click the <i>Discard</i> button	The field creation is discarded
8	Confirm crop field creation	Click the <i>Save</i> button	The crop field creation is confirmed

4.9 Live View

Functional description: In this view, the user can see data of the sensors located in the selected farm's fields.



Figure 68: Live view.

Formal description

Operation	Description	Result
1 View data of the sensors located in the farm	Click the drop-down button associated with the desired field	The data from the sensors are displayed

4.10 Datamap view

4.10.1 Add Datamap view

Functional description: In this view, the user can create a Datamap by specifying all the required input fields.

The screenshot shows a user interface for creating a Datamap. At the top, there are two buttons: 'Create columns' (marked 1) and 'Datamap settings' (marked 2). Below them is a message: 'Please set at minimum one column'. A horizontal line with numbered callouts (1 through 8) spans across several input fields. The fields include: 'Type' dropdown (marked 1), 'Context*' (marked 2), 'Parameter*' (marked 3), 'Unit*' (marked 4), 'Condition parameter*' (marked 5), 'Condition value*' (marked 6), 'Condition unit*' (marked 7), and a '+' button (marked 8). At the bottom left is a 'BACK' button, and at the bottom right is a red 'NEXT' button (marked 9).

Figure 69: Datamap view.

Formal description

	Operation	Description	Result
1	Set the type	Click the <i>Type</i> dropdown	The desired type is selected
2	Set Context	Enter the context	The context is filled in
3	Set Parameter	Enter the parameter	The parameter is filled in
4	Set Unit	Enter the Unit	The Unit is filled in
5	Set Condition parameter	Enter the Parameter	The parameter is filled in
6	Set Condition value	Enter the Condition value	The Condition value is filled in
7	Set Condition unit	Enter the Condition unit	The Condition unit is filled in
8	Open DataMap	Click the '+' button	The fields required to add a datamap are displayed
9	Go to next page	Click the <i>Next</i> button	The Datamap settings are displayed

4.10.2 Datemap Settings view

Functional description: In this view, the user is able to set the settings of his newly created datemap.

The screenshot shows the 'Datemap settings' view. At the top, there are two buttons: 'Create columns' (with a checkmark icon) and 'Datemap settings' (with a red circle icon). Below these are three input fields: 'Datemap name *' (labeled 1), 'Description *' (labeled 2), and 'Select equipment model *' (labeled 3). Underneath these is a section titled 'Additional declarations' containing four checkboxes: 'has_header', 'has_coordinate', 'has_date', and 'has_time' (labeled 4). Below the checkboxes is a slider for 'Privacy' status, with options 'Private' and 'Public' (labeled 5). At the bottom left is a 'BACK' button (labeled 6), and at the bottom right is a large orange 'FINISH' button (labeled 7).

Figure 70: Datemap settings view.

Operation	Description	Result
1 Set the datemap name	Enter the <i>name</i> of the datemap	The Name is filled in
2 Set the datemap description	Enter the <i>description</i> of the datemap	The Name is filled in
3 Select the equipment model	Enter a search string	Datamaps with a property that contains the entered string are filtered
4 Select the additional declarations	Click the checkbox next to the desired declaration	The checkbox is checked
5 Select the privacy status of the datemap	Slide the slider to the desired side	The slider is at the desired side
6 Back	Click the <i>Back</i> button	The add datemap view is displayed
7 Finish	Click the <i>Finish</i> button	The add datemap view is displayed

4.10.3 Datamap Overview

Functional description: In this view, the user can see all the datamaps available to them and download them. The user is given the options to edit the table and search through it with a search bar.

The screenshot shows a table titled "Datamaps" with columns: Name, Description, Has header, Has coordinate, Has date, Has time, Model Id, and Accessibility. There are five rows of data. At the top right are buttons for "Search" (with a magnifying glass icon), "Download" (with a downward arrow icon), and "Edit" (with a three-line icon). Below the table are buttons for "5 rows" (with a dropdown arrow), navigation arrows (< and >), and page numbers (1-5 of 18). Numbered callouts point to specific elements: 1 points to the "Search" button, 2 points to the "Edit" button, 3 points to the "Download" button, 4 points to the "5 rows" dropdown, and 5 points to the page number "1-5 of 18".

Name	Description	Has header	Has coordinate	Has date	Has time	Model Id	Accessibility
> Hoi	Hoi2	✓	✗	✓	✗	9	public
> asdasdsda	daadasd	✓	✗	✓	✓	9	public
> Test datamap	For testing purposes	✓	✗	✗	✗	19	public
> testdatamap1	testdatamap1	✗	✗	✗	✗	16	public
> 23	23	✗	✗	✗	✗	2	public

Figure 71: Datamaps.

Operation	Description	Result
1 Download the table	Click the <i>download</i> button	The table is downloaded
2 Add or remove columns	Click the button	The options to add or remove columns are shown
3 Filter Datamaps table	Enter a search string	Datamaps with a property that contains the entered string are filtered
4 Select how many rows are shown	Click the dropdown menu and select the desired amount of rows shown	The desire amount will be filled in and the table will show that many rows

4.11 History View

Functional description: In this view, the user can create graphs of the collected data to easily interpret and compare the data. Therefore the user needs to select the desired parameters from the dropdown menu's.

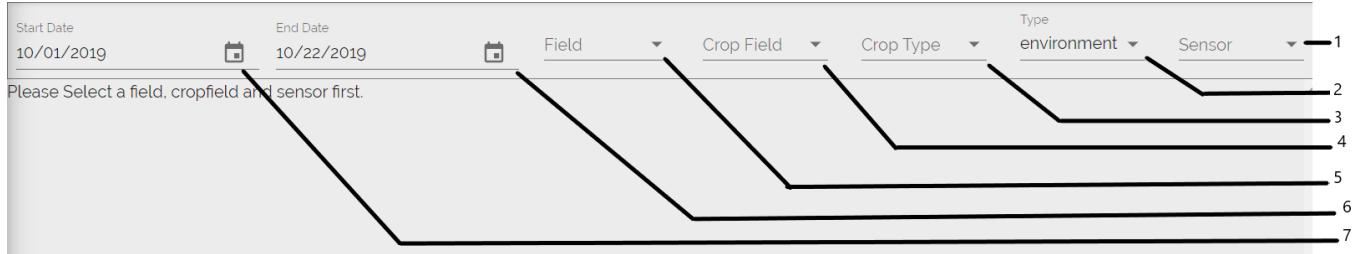


Figure 72: History view.

Operation	Description	Result
1 Set the start date	Click the <i>Start date calendar</i> button and select the start date	The start date is now filled in
2 Set the end date	Click the <i>End date calendar</i> button and select the end date	The end date is now filled in
3 Set field	Select the desired fields from the <i>Field</i> dropdown	The desired fields are filled in
4 Set Crop Field	Select the desired Crop Fields from the <i>Crop Field</i> dropdown	The desired crop fields are filled in
5 Set Crop Type	Select the desired Crop Type from the <i>Crop Type</i> dropdown	The desired crop Type is filled in
6 Set Sensor	Select the desired Sensor from the <i>Sensor</i> dropdown	The desired Sensor is filled in

4.12 Personal Settings View

Functional description: In this view, the user can alter the information associated with their account on CloudFarmer.

The screenshot shows a user interface for managing personal settings. It includes fields for First name, Last name, Email, Password, and Confirm password. There are also 'DISCARD' and 'SAVE SETTINGS' buttons. A numbered callout indicates the following steps:

- 1: Last name field
- 2: Email field
- 3: Email field (continued)
- 4: Password field
- 5: Confirm password field
- 6: Discard button
- 7: Save Settings button

Figure 73: Personal Settings Management Table.

Operation	Description	Result
1 Set the user's first name	Enter the first name	The first name is filled in
2 Set the user's last name	Enter the last name	The last name is filled in
3 Set the user's email address	Enter the email address	The email address is filled in
4 Set the password associated with the user's account	Enter the password	The password is filled in
5 Confirm the password	Enter the password entered in the <i>Password</i> field	The entered password is filled in
6 Discard the settings changes	Click the <i>Discard</i> button	The settings changes are discarded
7 Save the settings changes	Click the <i>Save Settings</i> button	The setting changes are saved

A Error Messages and Recovery Procedures

Message: Please use a valid email address

Diagnoses: The user did not input a valid email in the email field of the login page

Recovery Procedure: The user has to enter a valid email address

Message: Wrong email address or password, please try again

Diagnoses: The email and password the user entered do not match

Recovery Procedure: The user has to enter correct credentials

Message: Please fill in your first name

Diagnoses: The user did not enter their first name when signing up for CloudFarmer

Recovery Procedure: The user has to enter their first name

Message: Please use a valid email address

Diagnoses: The user did not enter a valid email address when signing up for CloudFarmer

Recovery Procedure: The user has to enter a valid email address

Message: Please fill in your password

Diagnoses: The user did not fill in a password to associate with the account they are creating on CloudFarmer

Recovery Procedure: The user has to enter a password

Message: Password must have at least 5 characters

Diagnoses: The user filled in a password of length less than 5 five characters to associate with their account on CloudFarmer

Recovery Procedure: The user has to enter a password of length 5 or more

Message: Please fill in your address

Diagnoses: The user did not fill in the address of their farm when creating one in the Farms View

Recovery Procedure: The user has to fill in their farm address

Message: Please fill in your postal code

Diagnoses: The user did not fill in the postal code when creating a farm

Recovery Procedure: The user has to fill in the postal code

Message: Please use a valid email address

Diagnoses: The user did not fill in a valid email address when creating a farm.

Recovery Procedure: The user has to fill in a valid email address

Message: Please fill in your phone number

Diagnoses: The user did not fill in their phone number when creating a farm

Recovery Procedure: The user has to fill in their phone number

Message: Please use a valid website

Diagnoses: The user did not fill in a valid website for the farm they are creating on the Farms View

Recovery Procedure: The user has to fill in the website

Message: Please use a valid website

Diagnoses: The user did not fill in a valid website for the farm they are creating on the Farms View

Recovery Procedure: The user has to fill in the website

Message: Please select a country

Diagnoses: The user did not select the country the farm they are creating is located

Recovery Procedure: The user has to select a country

Message: Please use a valid website

Diagnoses: The user did not fill in a valid website for the farm they are creating on the Farms View

Recovery Procedure: The user has to fill in the website

Message: Please fill in an equipment name

Diagnoses: The user did not fill in the name of the equipment they are creating

Recovery Procedure: Fill in the equipment name

Message: Please fill in an equipment description

Diagnoses: The user did not fill in the description of the equipment they are creating

Recovery Procedure: Fill in the equipment description

Message: Please fill in a brand name

Diagnoses: The user did not fill in the brand name of the equipment model they are adding

Recovery Procedure: Fill in the equipment model brand name

Message: Please fill in a model

Diagnoses: The user did not fill in the model name of the equipment model they are adding

Recovery Procedure: Fill in the equipment model brand name

Message: Please fill in a model year

Diagnoses: The user did not fill in the model year of the equipment model they are adding

Recovery Procedure: Fill in the equipment model year

Message: Please set at minimum one column

Diagnoses: The user did not set any of the columns in the Datamaps view and/or did not click on the add button

Recovery Procedure: Fill in the values for the columns and click on plus icon

Message: Please fill in your field name

Diagnoses: The user did not fill in the name of the field they are creating

Recovery Procedure: Fill in the name of the created farm

Message: Please fill in your field name

Diagnoses: The user did not fill in the name of the field they are creating

Recovery Procedure: Fill in the name of the created farm

Message: Please fill in your crop field name

Diagnoses: The user did not fill in the name of the crop field they are creating

Recovery Procedure: Fill in the name of the created crop field

B Glossary

Name	Definition
Active farm	An active farm is the farm to which the map, history, live, field, edit data and farm settings view are currently referencing.
Active field	An active field is the field to which the field view is currently referencing.
Active crop field	An active crop field is the crop field to which the field view is currently referencing.
Available farm	A farm of which the user is allowed to see the information.
CloudFarm	Database server for the application.
CloudFarmer	Application as defined by the project group and the customer.
CloudFarmers	The project group tasked to create the aforementioned application.
Crop	The virtual representation of a physical crop.
Crop field	The virtual representation of a physical crop field. A field can contain multiple crop fields.
Crop field information/ the information of a crop field	All the information about a specific crop field; location, crop type, crop year, crop season, area.
Customer	The person who assigned the task to create the application to the project group. In this case Dimas Satria.
Data sources	List of all the sources of data that are known by the application.
Equipment	The sensors in a field.
Farm	The virtual representation of a physical farm. A user is allowed to have more than one virtual farm.
<i>Farmer</i> (Role)	A person who works on the physical farm.
<i>Farm admin</i> (Role)	A user with unrestricted access to all data associated with a specific farm. (E.g farm information/permissions, field information/permissions ... etc)

Farm information/ the information of a farm	All the information about a specific farm; ID number, name, address, postal code, country, email, phone number, website.
Farm permissions	A set of rules that determine which users are able to read, write or delete farm information.
Field	The virtual representation of a physical field. A farm can have multiple virtual fields.
Field information/ the information of a field	All the information about a specific field; location, field name, area, size in hectares, soil type.
Field permissions	A set of rules that determine which users are able to read, write or delete field information.
<i>General user (Role)</i>	A user that is a member of a farm without permissions.
Member	A user is a member of a farm, if they have a role assigned to them on that farm.
Physical crop field	A physical crop field is a physical field that contains at least one type of crop.
Physical farm	An area of land that is devoted to agricultural processes, it is the basic facility for food.
Physical field	A physical field is a patch of dirt, clay, or some type of rock that is owned by a farmer, on which they are able to grow crops.
Selected farm	A farm that the user has selected.
User	A person that interacts with the application.
User role	A role that can be assigned to a user within a farm which defines all the field permissions and farm permissions of the user. These different roles are defined in the definitions and have the tag (role) at the end of them.
Views	The map view, history view, live view, fields view, settings view and personal settings view.