HIDAP
AgroFIMS

AGROFIMS v.1.0

USER MANUAL

CGIAR Platform for Big Data in Agriculture

CENTRO INTERNACIONAL DE LA PAPA CIP

IFPRI

Alliance

Bioversity International

CIAT International Center for Tropical Agriculture
Since 1967 Science to cultivate change

AgroFIMS - 2019

CONTENTS

ABOUT

The Agronomy Field Information Management System (AgroFIMS) has been developed on CGIAR's HIDAP (Highly Interactive Data Analysis Platform) created by CGIAR's International Potato Center, CIP. AgroFIMS draws fully on ontologies, particularly the Agronomy Ontology (AgrO)[1]. It consists of modules that represent the typical cycle of operations in agronomic trial management (seeding, weeding, fertilization, harvest, and more) and enables the creation of data collection sheets using the same ontology-based set of variables, terminology, units and protocols. AgroFIMS therefore enables *a priori* harmonization with metadata and data interoperability standards and adherence to the FAIR Data Principles essential for data reuse and increasingly, for compliance with funder mandates - without any extra work for researchers. AgroFIMS is therefore of value to anyone (scientist, researcher, agronomist, etc.) who wishes to easily design a standards-compliant agronomic research fieldbook following the FAIR Data Principles.

AgroFIMS also allows users to collect data electronically in the field, thereby reducing errors. Currently this is restricted to the KDSmart Android platform, but we expect to enable this capability with other platforms such as the Open Data Kit (ODK) and Field Book in v.2.0. Once data is collected using KDSmart, the data can be uploaded back to AgroFIMS for data validation, statistical analysis, and the generation of statistical analysis reports. V.2.0 will allow easy upload of the data from AgroFIMS to an institutional or compliant repository of the user's choice.

AGROFIMS WORKFLOW

AgroFIMS works in collaboration with the Android application KDSmart to provide a complete workflow to manage data for the creation of a fieldbook to the data analysis. Below are the different steps to follow to create, collect, analyze and save data using AgroFIMS:

1. Fieldbook creation in AgroFIMS
2. Digital data collection with KDSmart mobile app
3. Data analysis via AgroFIMS statistical analysis module
4. Data archiving in your own or institutional repository (for v.2.0)

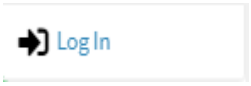
[1]AgrO webpage: https://bigdata.cgiar.org/resources/agronomy-ontology/

GET STARTED WITH AGROFIMS

Creating an account

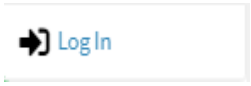
1. Go to https://apps.cipotato.org/hidapagrofims/#
2. Enter your email, password, name, last name, organization and country.
3. Click Create.
4. Your account has been created. You can Log in and start using AgroFIMS.
5. An email will be sent to your mailbox to confirm your account. **Don't forget to check your spam folder if you don't see the email in your inbox!**

Logging in

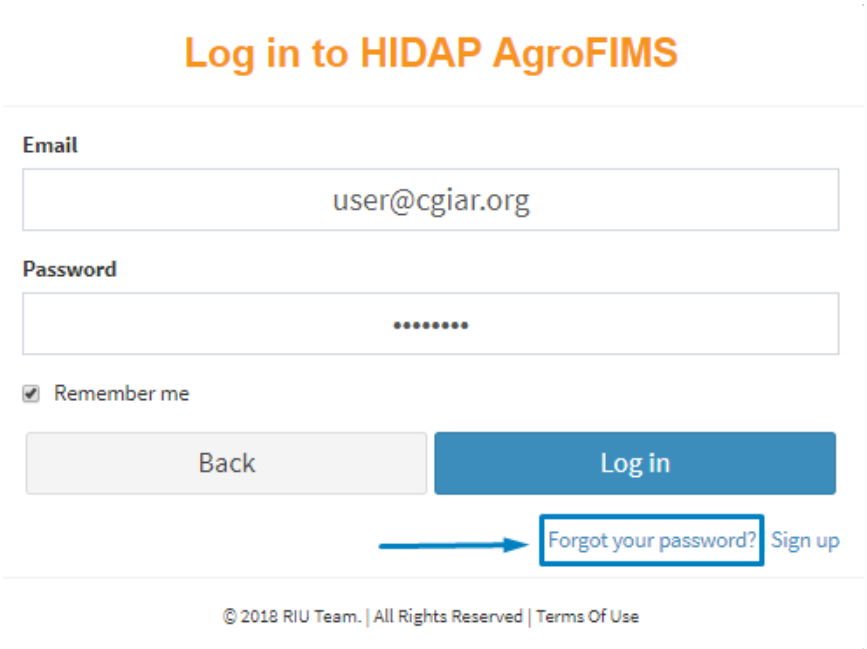
1. At the upper right corner of the Home page, click on  and select 

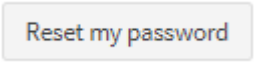
2. Enter your email and your password.
3. Click 

I have forgotten my password

1. At the upper right corner of the Home page, click on  and select 

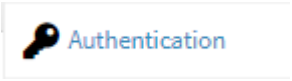
2. Select ''Forgot your password?''



3. Enter your email and click on 

4. A new password will be sent to your email address. **Don't forget to check your spam folder**.

Changing your password

1. Log in.
2. Click on  at the top right corner of the Home page.
3. Select 

4. Enter your current password and a new password.
5. Click ''Update password''.
6. Your password has been updated and you can now log in with your new password.

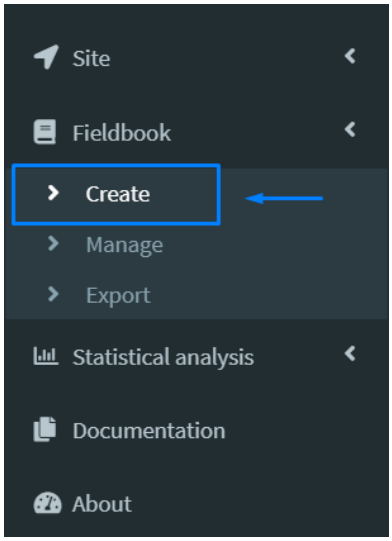
Home screen

1. Menu button to open and close the Menu
2. Help desk
3. Profile icon to open profile settings and to Log out
4. Menu

CREATE A NEW FIELDBOOK

STEP 1. OPEN A NEW FIELDBOOK

In the menu, select Fieldbook > Create to create a new fieldbook.



May I import an existing fieldbook?

It is not currently possible to import a fieldbook in AgroFIMS.

STEP 2. EXPERIMENT

In this section, you can detail the experiment metadata.

Experiment ID

The Experiment ID is a code generated by AgroFIMS to uniquely name experiments. It is made up of the 2 first letters of Experiment name + the 2 first letters of Experiment project name + unique number

May I leave a case blank?

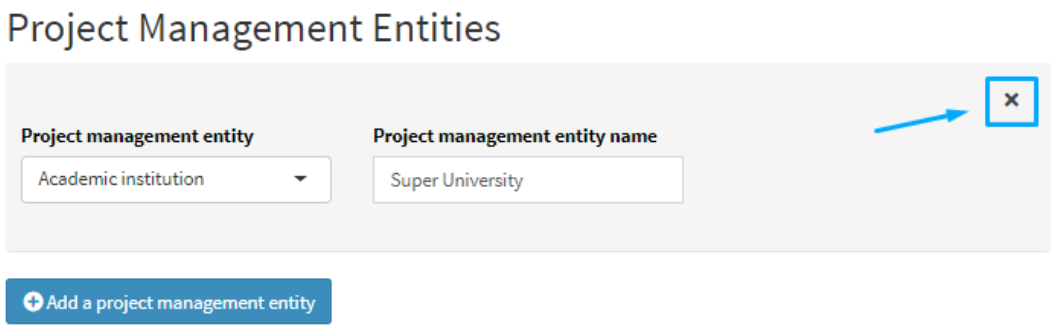
The mandatory fields are marked with a red asterisk. All other fields may be left blank. However, we recommend that you provide as much information about your experiment as possible. Robust metadata will allow better understanding and interpretation of your data set, and greatly augment its discovery and re-use in the immediate and distant future, assuring that your data continues to provide value well after collection.

Adding a Funding agency – Project management entity – Experiment lead

Click on  button to add a new line.

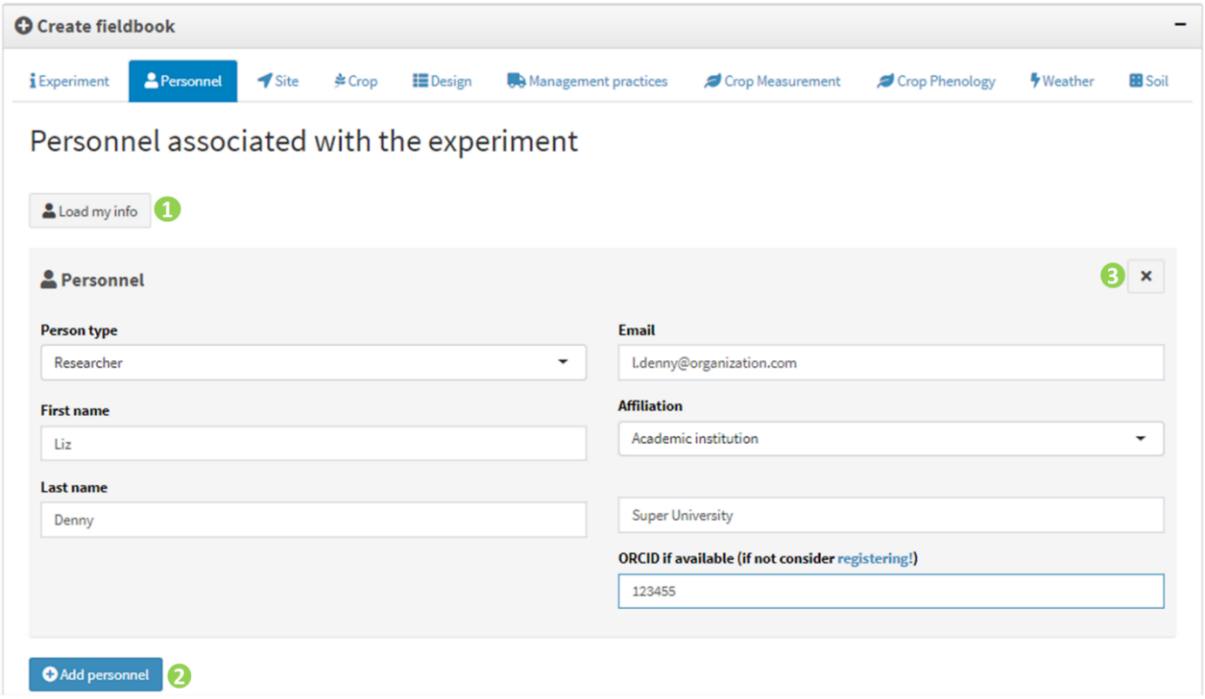
Removing a Funding agency– Project management entity – Experiment lead

Click on the cross at the upper right side of the line to remove it. There is a minimum of one line per category. If you want to remove the information in this line, you can erase the name typed.



STEP 3. PERSONNEL

In this section you can add information about the personnel linked to the experiment.



Loading my info

You can start by adding your profile information using the button '' Load my info'' 1 . This will auto-fill the boxes with information registered in your profile.

Adding personnel

Click on 2 to add a new person to the experiment.

Removing personnel

Click on 3 to remove personnel. The first box cannot be deleted. If you want to remove the information of this person, you can erase the text boxes.

Modifying profile information

You can view your profile information by selecting Account > Profile in the Menu. If you wish to update your profile information, please send an email to agrofims@cgiar.org.

STEP 4. SITE

In this section you can describe the experimental site and its surroundings.

Creating a new site

1. Select Site > Create in the Menu.
2. Fill the information about the site type, site name, country name and administrative divisions using text boxes and picklists as appropriate. You can zoom in the map to help you find the name of your location, but you cannot use the map to directly pinpoint the site.
3. Once you have filled the information about the site and the site is pinpointed on the map, click 

at the bottom left of the page.

Adding a site to your experiment

1. In the Menu, go to Fieldbook > Create.
2. Go to the section Site.
3. Under Site information, select the country of the experimental site and the site name.

I don’t find my site.

1. In the Menu, go to Fieldbook > Create > Site.
2. Under Site information, if the site doesn't appear in the site list, click on Refresh.
3. If the site is still absent from the list, you can check the sites list by clicking on Site > Manage in the Menu.
4. If the site is not listed here, it may not have been saved during its creation. You may create the site again by selecting Site > Create in the Menu.

What is a site ID?

The site ID is a unique identifier automatically generated by AgroFIMS to distinguish the sites in your sites list.

Viewing Site Information

1. Go to Site> Manage in the Menu.
2. Click on  next to the site you want to get information about.

Deleting a Site

1. Go to Site> Manage in the Menu.
2. Click on  next to the site you want to delete.

Updating information for a site

A site cannot be updated. You must create a new site.

STEP 5. CROP

This section is dedicated to the description of the crops cultivated in the experiment.

Adding a crop or a variety to the experiment

1. Select the type of cropping system of your experiment. Currently the choices are: Monocrop, Intercrop or Relay crop.
2. Select the crop's common name. If the crop is not listed, select ''Other'' and specify the crop common name. If "Intercrop" or "Relay crop" are selected, AgroFIMS will require you to add at least 2 crops. To add more, click on "add crop".
3. Enter the variety name. You can enter as many varieties as needed.

May I import a list of varieties or genotypes?

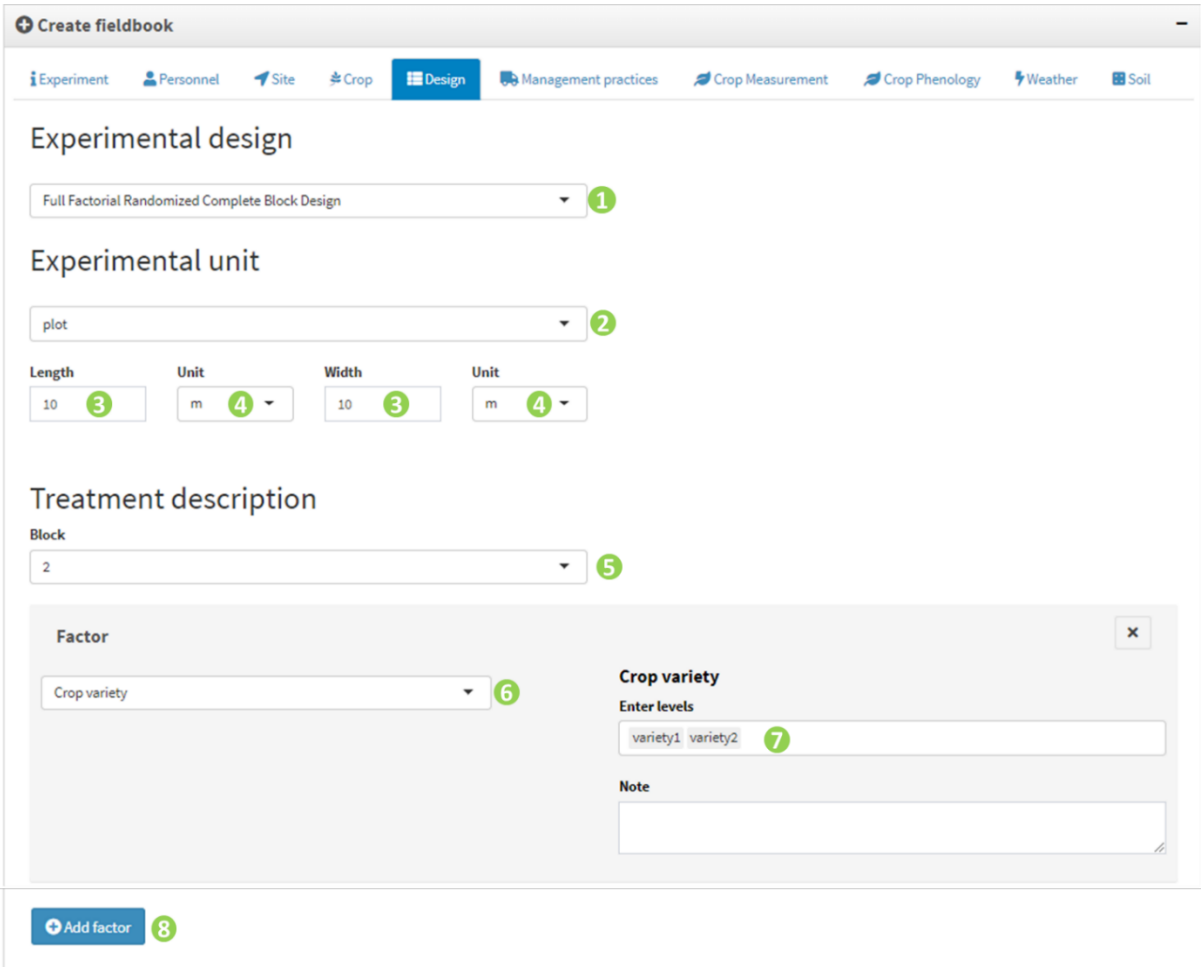
It is not currently possible to import a list of varieties or genotypes. You have to manually enter your list in the text box: Variety name(s)

What is Fieldbook ID?

Fieldbook ID is a unique identifier created by AgroFIMS to identify your experiment. It is made of the concatenation of the following information: F_Cropping type_Crop name_Experiment start date_Country. "F" stands for Fieldbook in this case.

STEP 6. DESIGN

In this section you can specify the design of the experiment and its treatments, levels etc.



Specifying the design of the experiment

1. Select the experimental design of your experiment using the drop-down list 1
2. Select the experimental unit (plot, field, pot) 2
3. Enter the size of the experimental unit selected 3
4. Select a unit to express the size of the experimental unit using the dropdown list 4

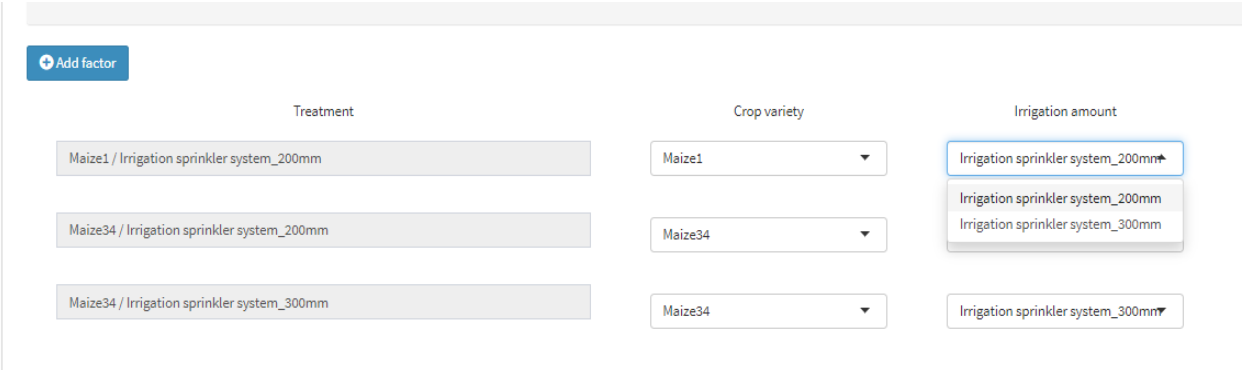
Creating an experiment with only 1 repetition

It is not possible to design an experiment with only one replication, thus, AgroFIMS requires that you add at least two replications. Currently AgroFIMS does not allow data collection from demonstration experiments and farmer surveys, which may not be replicated. This capability will be developed in v.2.0.

Defining the treatment of the experiment

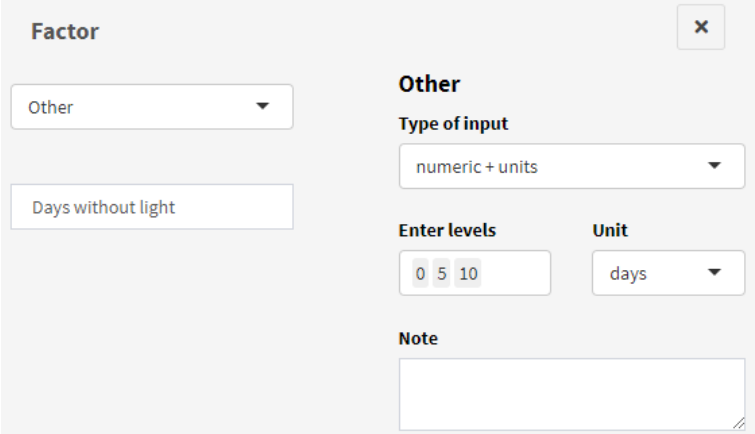
A treatment is a combination of factor levels. A factor is a controlled independent variable whose levels are set by the experimenter. Each factor has two or more levels (i.e. two or more different values)[2].

1. Specify the number of treatments and repetitions (or blocks) 5
2. Select a factor in the list 6. If the factor is not listed, select ''Other'' and specify the name of the factor.
3. Enter the levels of the factor 7
4. To add another factor, click on "Add factor" 8
5. For the CRD and RCBD designs, define the treatments by assembling the factors and their levels using the dropdown menus at the bottom of the page.



Finding your factor

1. Scroll the dropdown menu or start typing the name of the factor; AgroFIMS will narrow down possibilities for you 6. The factors have been listed using broader categories. This means that if you want to test different amounts of urea, the factor you should select is "Fertilizer amount". If you want to test different potato varieties, the factor will be "Crop variety".
2. If the factor is not in the list, select ''Other'' and write in the name of the factor in the text box, select the type of input, the unit if needed, and the levels.



[2] https://stattrek.com/statistics/dictionary.aspx?definition=treatment

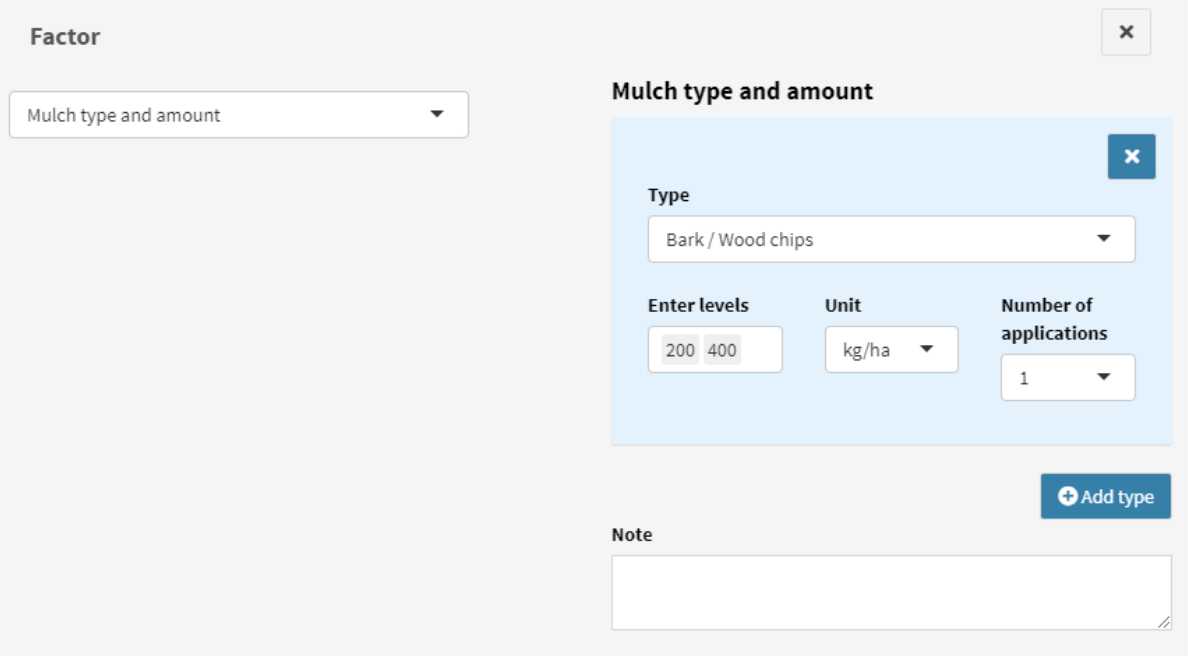
Type and amount factor

To allow a wide range of treatments, some factors have been grouped together. For example, the irrigation amount factor has been grouped with the irrigation type factor. This way it is possible to compare different types of irrigation with different amounts (Sprinkler 200ml versus Drip Irrigation 300ml).

Note: This is the case for mulch, fertilizer, irrigation, weeding product, crop residue, nutrient element, biotic stress, biotic stress control product.

For these factors:

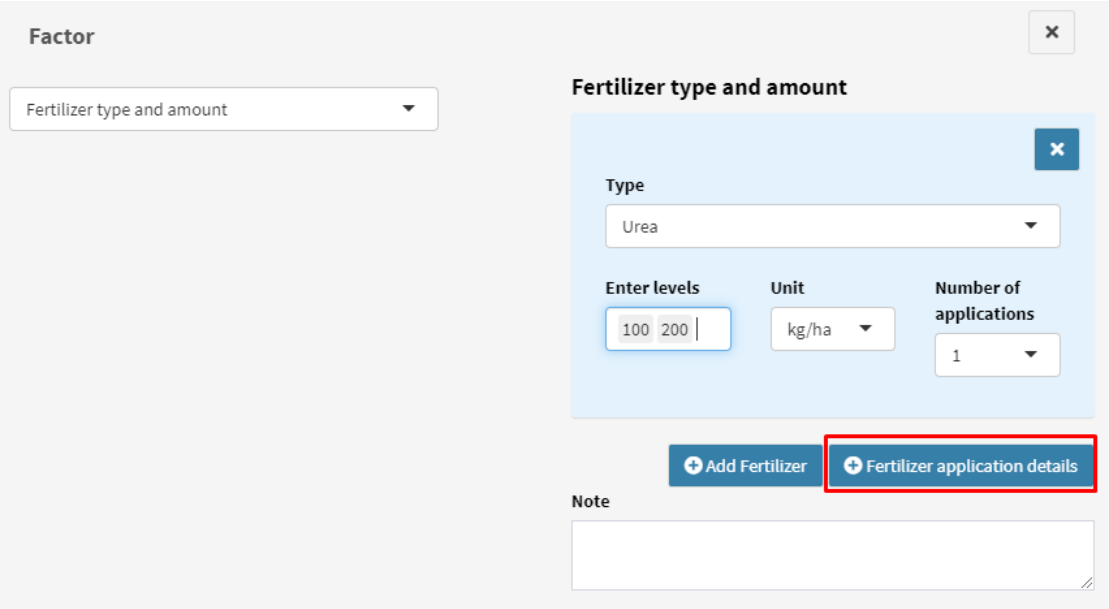
1. Select the factor in the list
2. Specify the type of factor
3. Enter the level and their units
4. Click ''add type'', if you need to add another type of the same factor



Fertilizer type and amount factor

For this factor you have the possibility to calculate the nutrient amount that will be applied to the field and to specify the management practices.

1. Select “Fertilizer type and amount” in the factor list.
2. Once you have specified the fertilizer type, levels and number of application splits, click on 



3. A pop-up window will appear. If it is blank, click on Refresh
4. Check if the "Nutrient content in product" data corresponds to your fertilizer product. Modify the nutrient content in the product if needed.
5. Specify the fertilizer application timing, and the technique and traction used to apply the fertilizer.
6. Click on Calculate Nutrient Amount to get the amount of nutrient that will be applied in the field for each level. This information will be displayed in the Protocol tab of the Excel fieldbook and in Trial attributes in KDSmart. **Note that this is currently calculated on a per hectare basis; you will need to use this to calculate the amount required for the area over which you are applying the fertilizer.**

Nutrient type and amount factor

For this factor you have the possibility to calculate the amount of product to be applied in the field and to specify the management practices.

1. Select "Nutrient type and amount" in the factor list.
2. Once you have specified the type, levels and number of splits, click on Fertilizer application details
3. If the pop-up window is empty, click on Refresh
4. Specify the fertilizer product application timing, the technique and traction that will be used to apply the product.
5. Select the product to apply from the list. If the product is not listed, select ''Generic fertilizer''.
6. Check if the "Nutrient content in product" data corresponds to your fertilizer product. Modify the nutrient content in the product if needed.

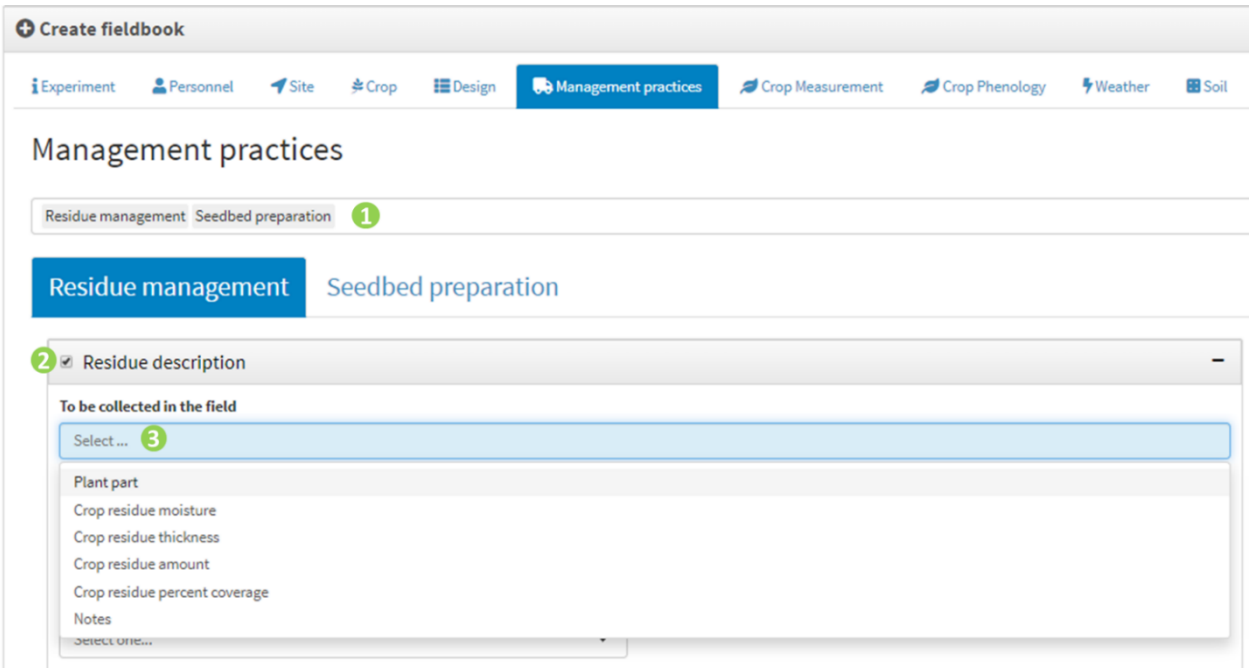
7. Click on Calculate Product Amount to get the amount of product that must be applied in the field to get the level of nutrient desired. This information will be displayed in the Protocol tab of the Excel fieldbook and in Trial attributes in KDSmart. **Note that this is currently calculated on a per hectare basis; you will need to use this to calculate the amount required for the area over which you are applying the fertilizer.**

Get a preview of your fieldbook

Once you have filled information in the Design tab you can click Book Preview at the bottom right on the page to get a preview of the fieldbook with plot numbers and the treatment assigned to them.

STEP 7. MANAGEMENT PRACTICES

In this section you can describe the experimental protocol.



1. Select the management practices that will be implemented in the field 1
2. Fill the information for each of them.
3. When there is more than one management practice under a section, like for planting, residue management or seedbed preparation, don't forget to tick the box next to the management practice you wish to select. 2

The information filled in this section will be exported in the tab Protocol of the Excel file, and will be listed under Trial attributes in KDSmart.

How to indicate a management practice has to be noted in the field?

If you wish to get information about a management practice that will be done in the field, like the date of sowing or the depth of tillage:

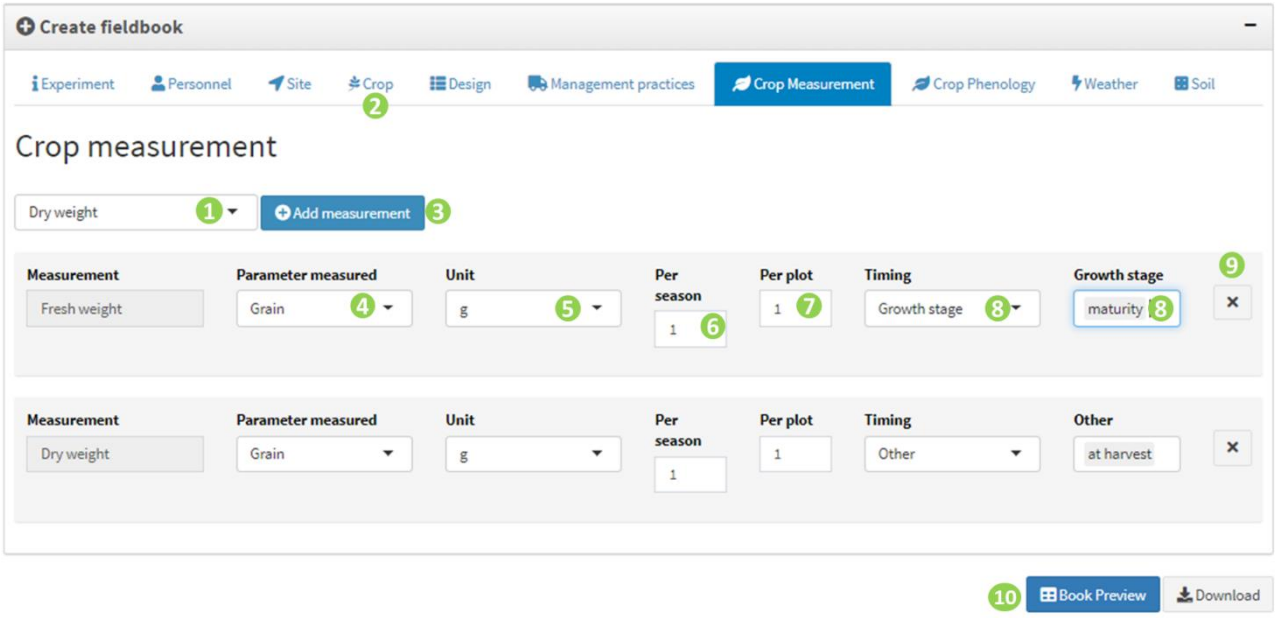
1. Select the management practice. 1
2. Select the management practice to be noted in the field in the box ''To be collected in the field''. 3

I don't find the management practice I am looking for

Currently, AgroFIMS doesn't allow users to create their own management practices as this would defeat the goal of harmonizing data among experiments. However, we understand that some management practices may be missing from the current lists. Please contact us at agrofims@cgiar.org if you would like to discuss terms or practices you feel should be in AgroFIMS.

STEP 8. CROP MEASUREMENT

In this section you can select and describe the measurements to be made on the crops.



Selecting a crop measurement

1. Select a measurement in the drop-down list. 1 You can either scroll through the list or delete the default and type the name of the measurement – the auto-complete feature will select the term if the measurement is in the list.
2. If the drop-down list is empty, it may be that you have forgotten to select a crop. Verify that you have selected a crop in the Crop section. 2
3. Once you have found your measurement, select it and click on Add measurement. 3 The measurement will be added to the list of measurements for this experiment.
4. Indicate on which part of the plant the measurement will be done (parameter measured 4), the unit of measurement 5, the number of times it has to be measured during the season 6, how many samples have to be taken per plot each time 7 and the measurement timing 8
5. You can add as many crop measurements as needed.

Changing the unit of a measurement

To change the unit of measurement you can click on the arrow at the right side of the dropdown list. 5 A list of units will appear. If the unit you are looking for is not listed, you can select ''other''. However, there is currently no option to specify ''other'' for units. We encourage you to use standard units as much as possible. However, please contact us at agrofims@cgiar.org if you would like to see units in AgroFIMS that are not currently there.

Removing a measurement from the list

To remove a measurement, click on the cross at the upper right side of the measurement box. 9

Get a preview of your fieldbook

Once you have selected the Crop measurements of the experiment, you can click on Book Preview 10 to display the Fieldbook preview with the measurements.

STEP 9. CROP PHENOLOGY

In this section you can select the phenologic measurements to be made.

Selecting a phenological measurement

Click on the measurement to be collected in the field. Once a phenological measurement is selected it is highlighted in blue.

If the section is empty, verify that you have selected a crop in the Crop section.

I don't find my measurement in the list

Currently, AgroFIMS doesn't allow users to create their own measurement. Please contact us at agrofims@cgiar.org if you would like to discuss measurements you feel should be in AgroFIMS.

How do I remove a phenological measurement from my list?

If a phenological measurement is highlighted in blue and you wish to remove it from the list of measurements, click again on it until it is no longer highlighted in blue.

STEP 10. WEATHER

This section is dedicated to the selection of weather measurements to make during the experiment.

Selecting a weather measurement

1. Select a measurement in the drop-down list. You can either scroll through the list or delete the default and type the name of your measurement – the auto-complete feature will select the term if the measurement is in the list.
2. Once you have found your measurement, select it and click on 

. The measurement will be added to the list of measurements for this experiment.
3. You can then indicate its unit, the number of times it has to be measured during the season, and its timing.
4. You can add as many weather measurements as needed.

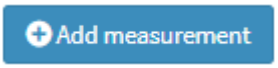
Removing a measurement from the list

To remove a measurement, click on the cross at the upper right side of the measurement box.

STEP 11. SOIL

This section is dedicated to the selection of soil measurements to make during the experiment.

Selecting a measurement

1. Select a measurement in the drop-down list. You can either scroll through the list or delete the default and type the name of your measurement – the auto-complete feature will select the term if the measurement is in the list.
2. Once you have found your measurement, select it and click on 

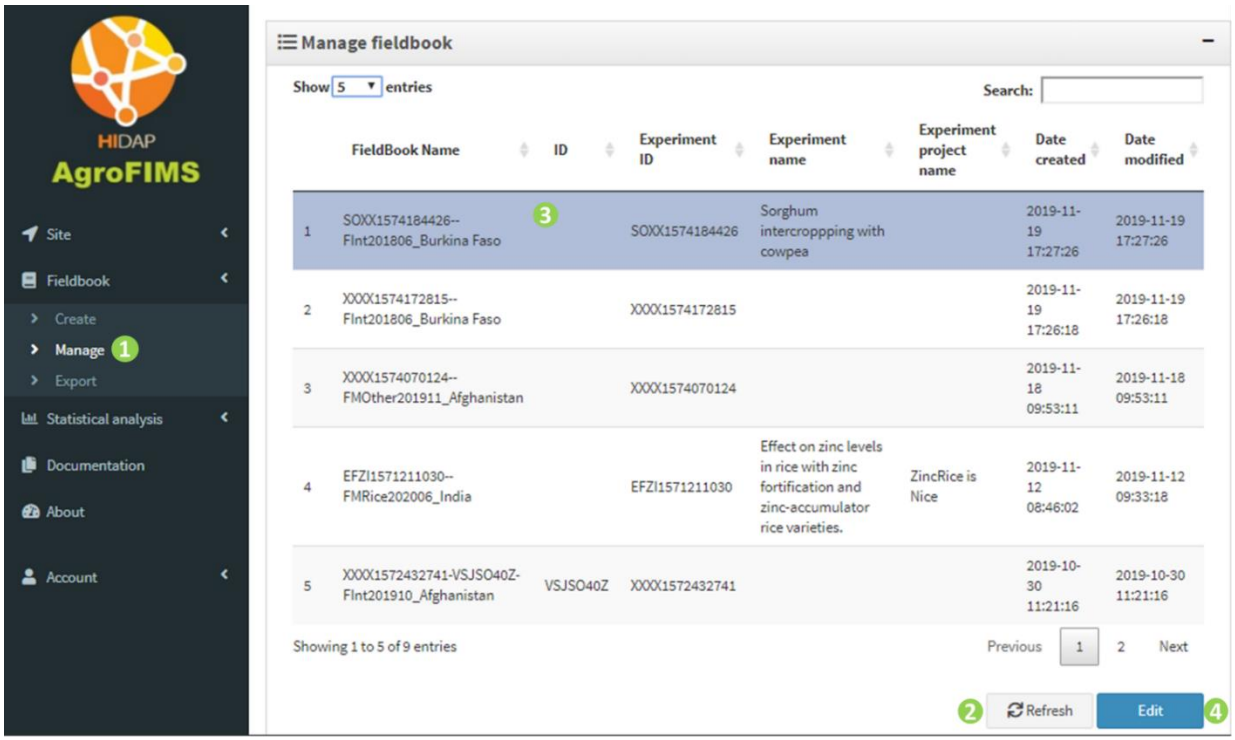
. The measurement will be added to the list of measurements for this experiment.
3. You can then indicate its unit, the depth of the measurement, the number of times it has to be measured during the season, and its timing.
4. You can add as many soil measurements as needed.

Removing a measurement from the list

To remove a measurement, click on the cross at the upper right side of the measurement box.

MANAGE MY FIELDBOOK

Fieldbooks created in AgroFIMS are saved in the "Manage" section of the left-hand panel in AgroFIMS. These saved fieldbooks can be opened for editing.



Finding my saved fieldbook

1. Select Fieldbook > Manage in the Menu 1
2. If you don't see any fieldbook or if you don't find the one you are looking for, click on Refresh 2
3. It can take some minutes for the experiment to appear in the list. If the experiment is not listed after some time, you can contact us at agrofims@cgiar.org.

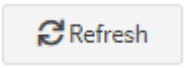
How to duplicate or edit an existing fieldbook?

1. Select Fieldbook > Manage in the Menu. 1
2. Select the fieldbook you wish to duplicate/edit. Once selected, the fieldbook is highlighted in blue. 3
3. Click on Edit 4
4. The fieldbook will be opened in AgroFIMS ready to be edited. To duplicate a fieldbook, modify the experiment name and/or the experiment site and click on Save.
5. Currently, AgroFIMS is not able to save items selected in the dropdown lists. You will have to refill them. We apologize for the inconvenience. We are working on this feature for the next release.

EXPORT MY FIELDBOOK

Exporting AgroFIMS fieldbook in a format readable by a mobile data collection application

To use AgroFIMS fieldbooks with a mobile data collection tool you need to export the fieldbook in a format readable by the mobile application. Currently AgroFIMS is only compatible with the Android mobile application KDSmart.

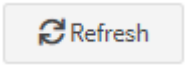
1. To export your fieldbook, select Fieldbook > Export in the Menu.
2. In the list of fieldbook, select the one to export.
3. If the fieldbook does not appear in the list, click 

4. Click 

5. A .kdx file will be downloaded to your laptop.
6. You can send this file to the data collector or transfer it to the device where KDSmart is installed (via email, a cloud or a direct USB transfer).

Exporting AgroFIMS fieldbook as an Excel file

You can visualize the fieldbook created in AgroFIMS in an Excel file.

1. Select Fieldbook > Export on the Menu.
2. In the list of fieldbooks, select the one you wish to export.
3. If your fieldbook does not appear in the list, click 

4. Click 

5. An Excel file will be downloaded to your laptop.

Content of the Excel file tabs

Excel file tab name	Origin of the content from AgroFIMS interface
Metadata	Information from the AgroFIMS sections: Experiment, Personnel, Site, Crop, Design.
Protocol	All the information given in the AgroFIMS Management Practices section.
Notes_Deviations	Tab designed to note down unexpected events that could happen in the field.
Crop_measurements	Measurements to be collected in the field and selected in the AgroFIMS section Crop Measurement.
Residue management	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Residue management> To be collected in the field.
Seedbed Preparation	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Seedbed preparation> To be collected in the field.
Fertilizer Management	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Fertilizer management> To be collected in the field.
Planting_ Transplanting	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Planting, transplanting> To be collected in the field.
Mulch_management	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Mulch management> To be collected in the field.
Irrigation	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Irrigation> To be collected in the field.
Weeding	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Weeding> To be collected in the field.
Harvest	Measurements to be collected in the field and selected in the AgroFIMS section Management practices>Harvest> To be collected in the field.
Phenology	Measurements to be collected in the field and selected in the AgroFIMS section Crop Phenology.
Weather	Measurements to be collected in the field and selected in the AgroFIMS section Weather.
Soil	Measurements to be collected in the field and selected in the AgroFIMS section Soil.
TraitList	All measurements to be collected in the field with their unit, validation rule, data type, timing. Biotic and abiotic variables are automatically listed here to be available in the data collection application if needed.

COLLECT DATA WITH THE KDSMART MOBILE APP

AgroFIMS is compatible with the Android mobile application KDSmart that allow digital data collection. Compatibility with other mobile applications (ODK, Field Book app) will be available in the next version of AgroFIMS.

STEP 1. DOWNLOAD KDSMART

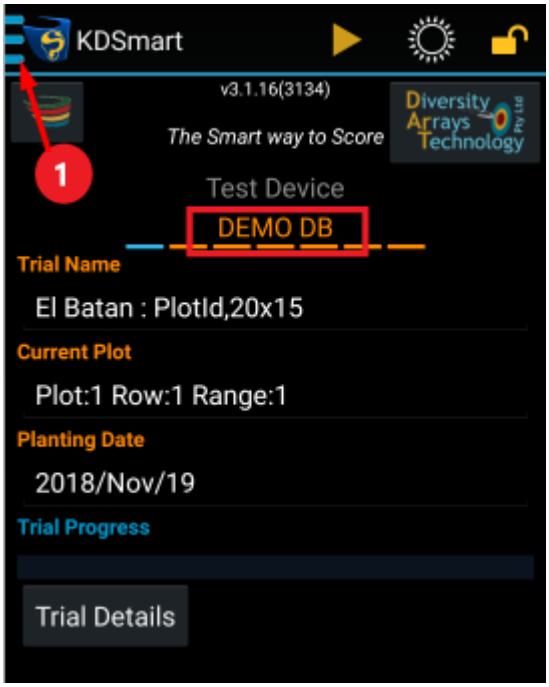
1. Download and install the application on an Android device: https://play.google.com/store/apps/details?id=com.diversityarrays.kdsmart&hl=en_US
2. A tutorial for KDSmart is available on the website of KDDart: http://www.kddart.org/help/kdtutorials/html/KDSTutorial.html#

STEP 2. SET UP KDSMART

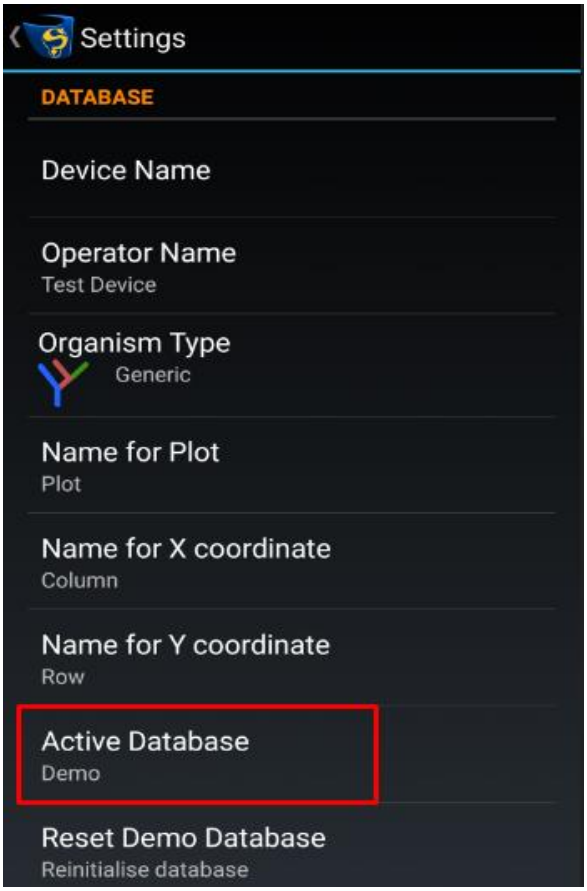
Set the app in production mode

The application is in Demo DB mode. To enable all the functionalities the mode Production has to be enabled.

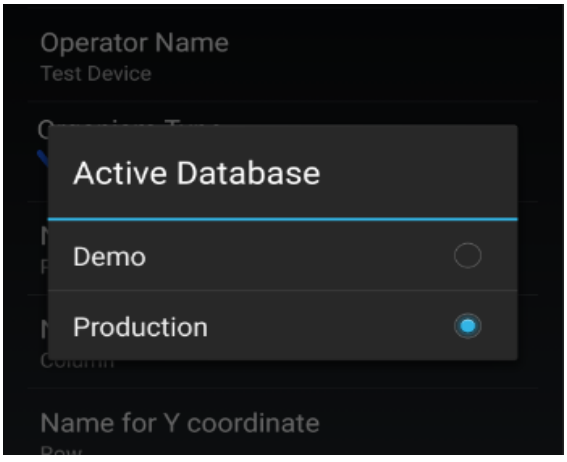
1. In the home screen, click on the menu icon (1) on the top left, and select Settings.



2. In the Settings menu, click on Active Database



3. Select Production



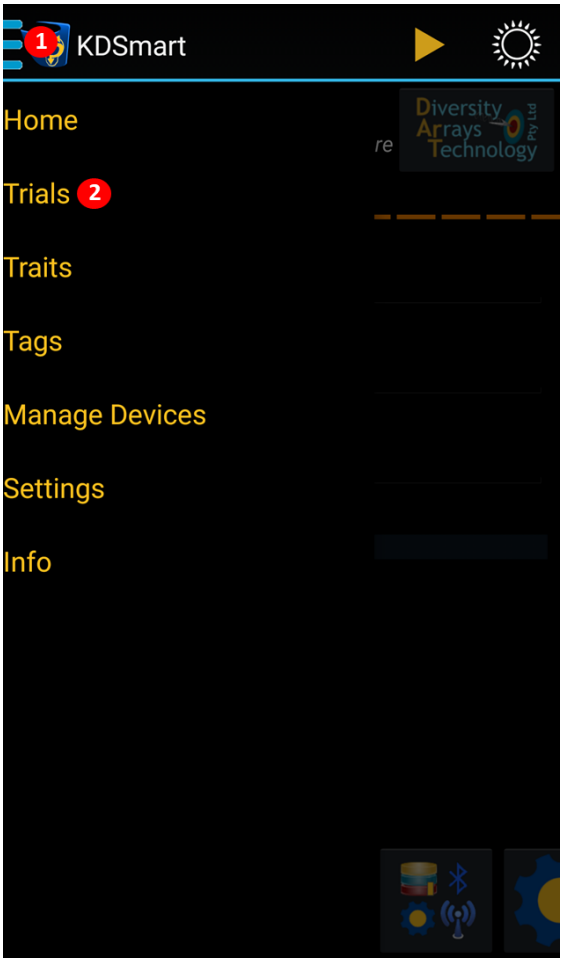
4. To go back to the home screen, click on the arrow at the top left.

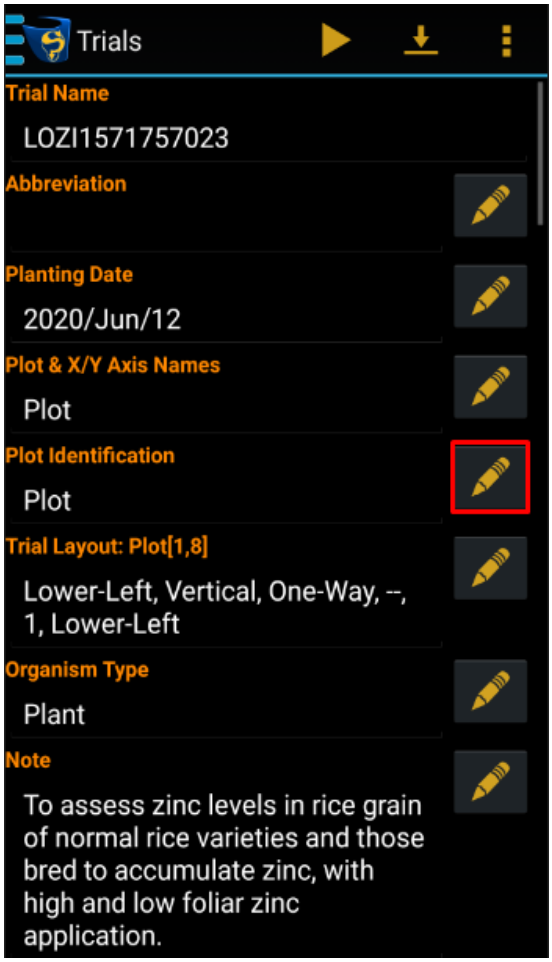
Identifying the plots

In KDSmart the plots can be named either by their number or by the number of their column, row and block.

1. Download a trial (cf. KDSmart tutorial).
2. Click on the three dots at the top left 1
3. Select “Trials”. 2

4. Select your trial in the list to open “Trial Details”
5. Click on the edit icon next to “Plot identification”



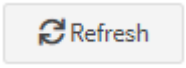


6. Select “Plot” if you want to identify the plots by their number, select "Block/Field Column/Field Row” if you prefer to identify the plots with their Block/Column and Row numbers.

STEP 3. UPLOAD AN AGROFIMS FIELDBOOK IN KDSMART

Exporting AgroFIMS fieldbook in a format readable by KDSmart

To upload an AgroFIMS fieldbook in KDSmart, you have to first export the AgroFIMS fieldbook as a .kdx file.

1. In AgroFIMS select Fieldbook > Export on the Menu.
2. In the list of fieldbooks, select the one you wish to export.
3. If your fieldbook does not appear in the list, click 

4. Click 

5. A .kdx file will be downloaded to your laptop.

Send the file to the mobile device

Once you have created a .kdx file, you have to send it to the device where KDSmart is installed:

- **Via email**: send an email to yourself or the data collector, with the .kdx file attached. Open this email on the mobile device where KDSmart is installed and download the .kdx file.

- **Via a cloud**: On your laptop save the .kdx file on a cloud-based service (OneDrive, Dropbox, Google Drive, etc.). Open the same service on the mobile device and download the .kdx file.

- **Via USB transfer**: Connect the mobile device to your laptop. Save the .kdx file in the folder ''Download'' of the mobile device.

Open the file in KDSmart

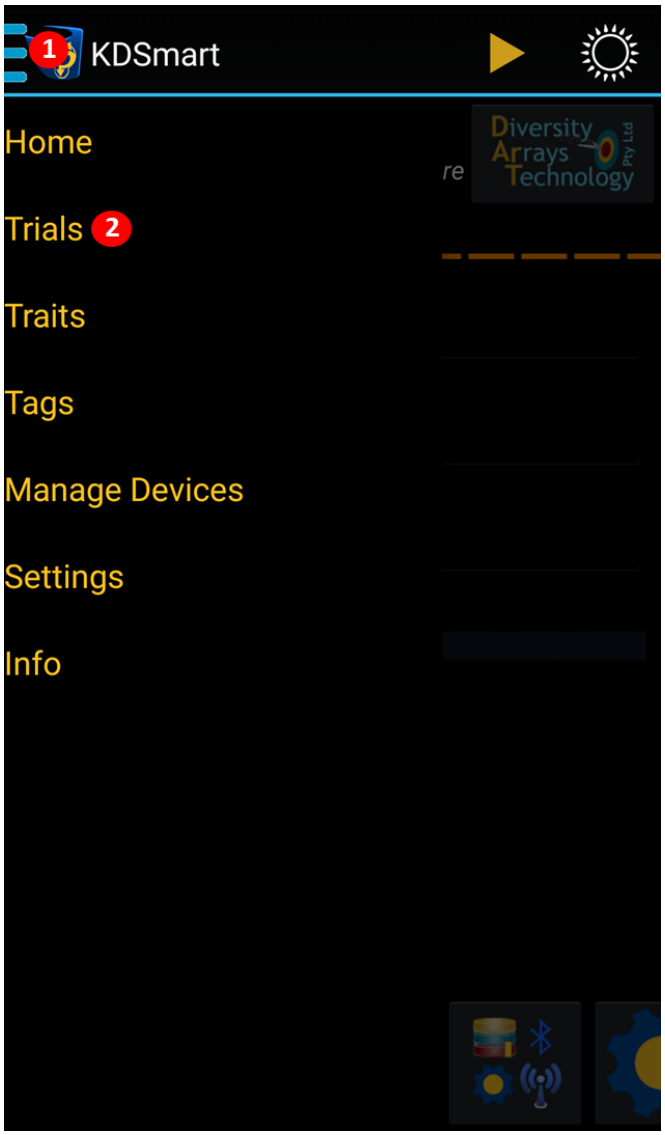
Once the .kdx file in stored in your mobile device, you can open it in KDsmart following this tutorial: http://www.kddart.org/help/kdtutorials/html/KDSTutorial.html#step-1-importing-a-scoring-set

Where to find the information filled in AgroFIMS in KDSmart

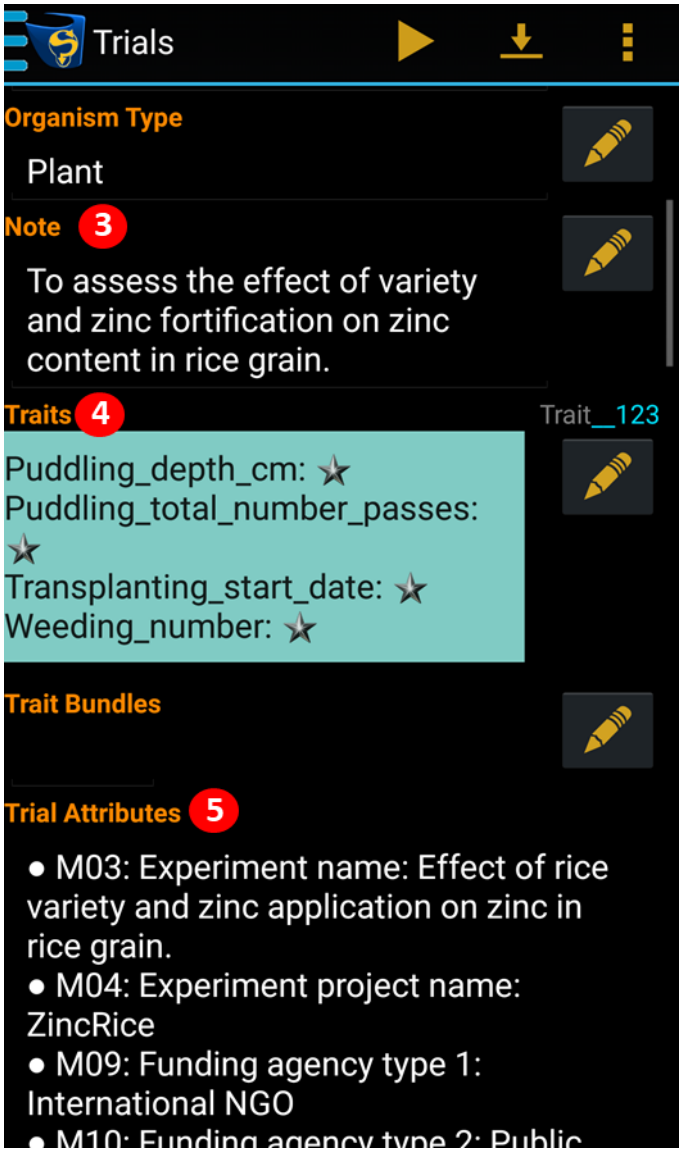
A. In Trial Details

1. Click on the three dots at the top left of KDSmart screen. 1

2. Select “Trials” 2

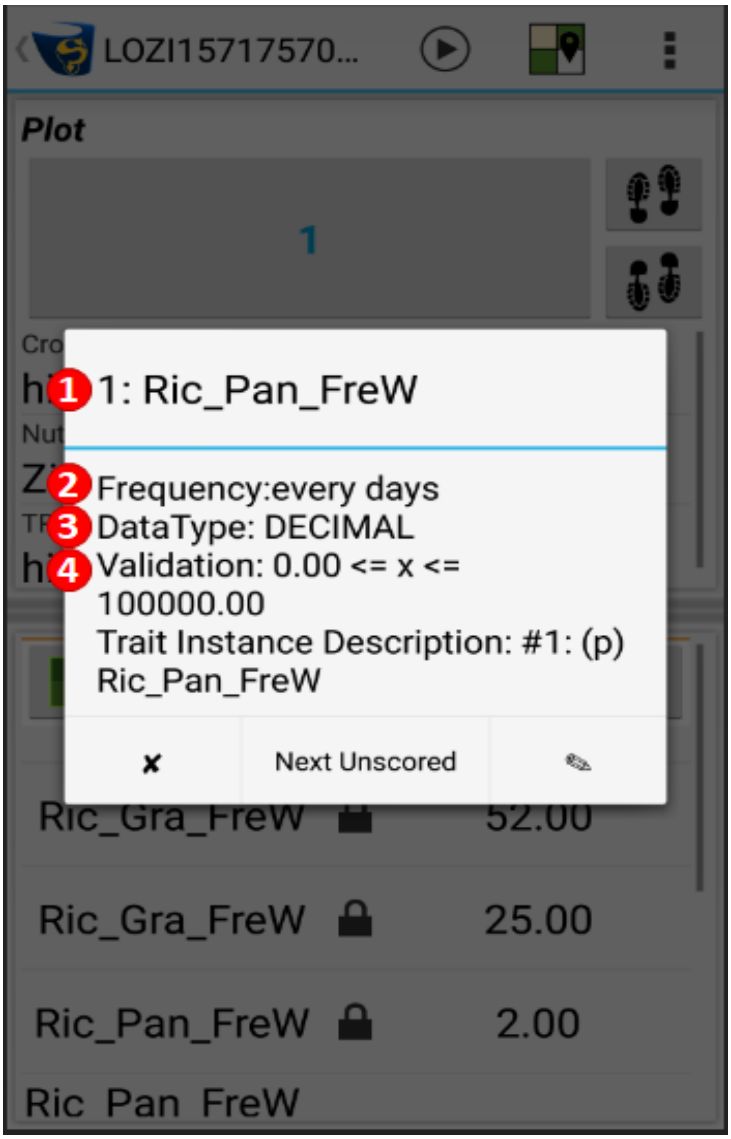


3. Select your trial in the list to open the Trial Details page of your experiment.
4. Experiment objective is noted as Note 3
5. Measurements (Crop, Phenology, Soil, Management practices to be collected in the field) are listed as “Traits”. 4
6. Experiment, personnel, site, crop and design information are listed under “Trial attributes”. They start with a M00. 5
7. Management practices (Protocol tab of the Excel fieldbook) are listed under “Trial attributes”. They start with a P00. 5



B. In the Scoring Panel

1. Start scoring a trial (cf. KDSmart Tutorial)
2. Click on a Trait to get trait information (also listed in the TraitList tab of the Excel fieldbook)



1. TraitAlias
2. Measurement timing
3. Type of data
4. Trait validation rule

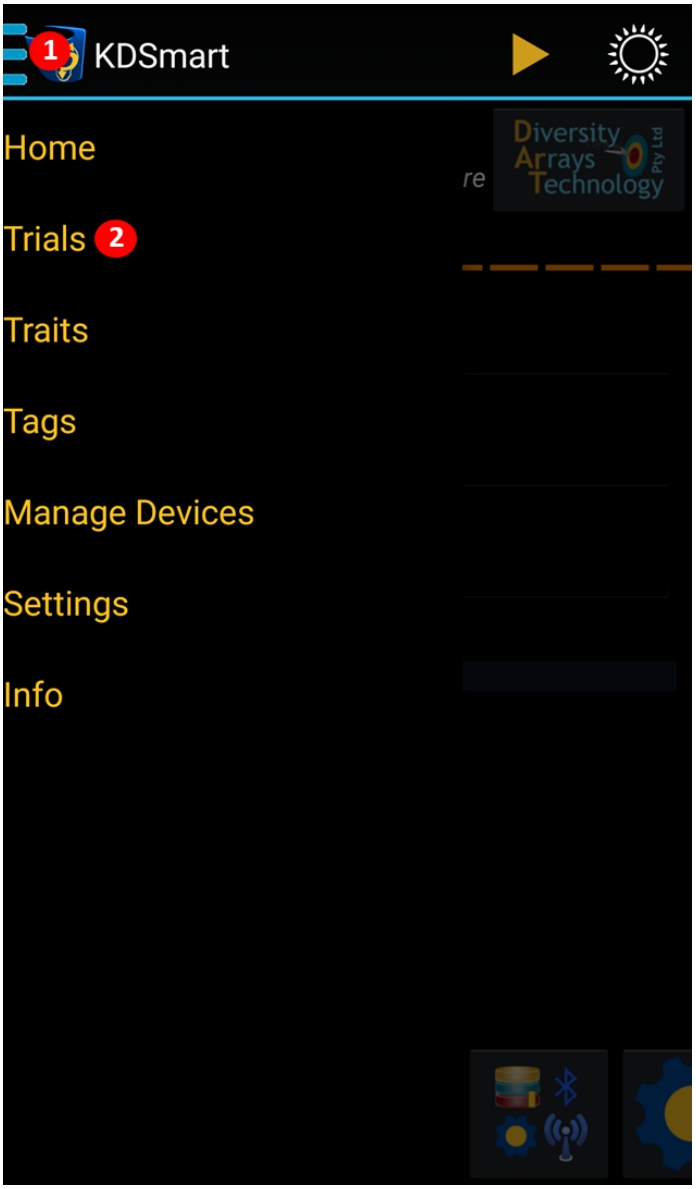
ANALYZE THE DATA

Once the data have been scored in the mobile application, they can be analyzed via AgroFIMS or exported as raw data in an Excel file.

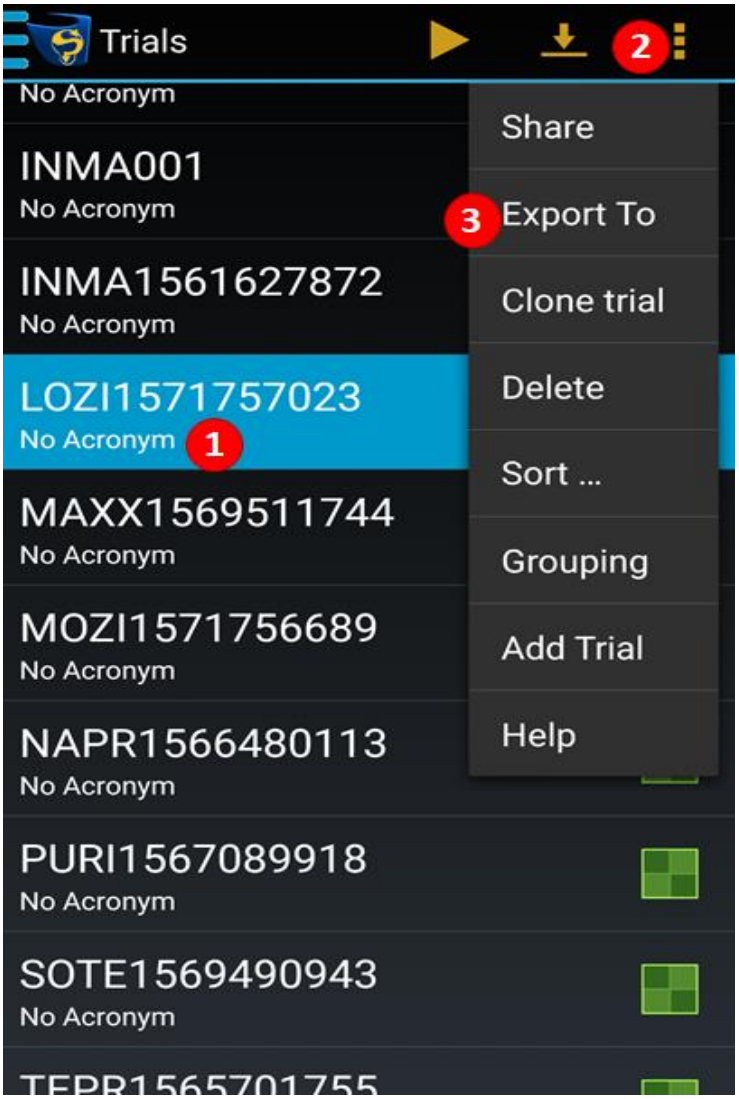
STEP 1. EXPORT THE DATA AS A .ZIP FILE

Once the data have been scored in KDSmart, they have to be exported as a zip file.

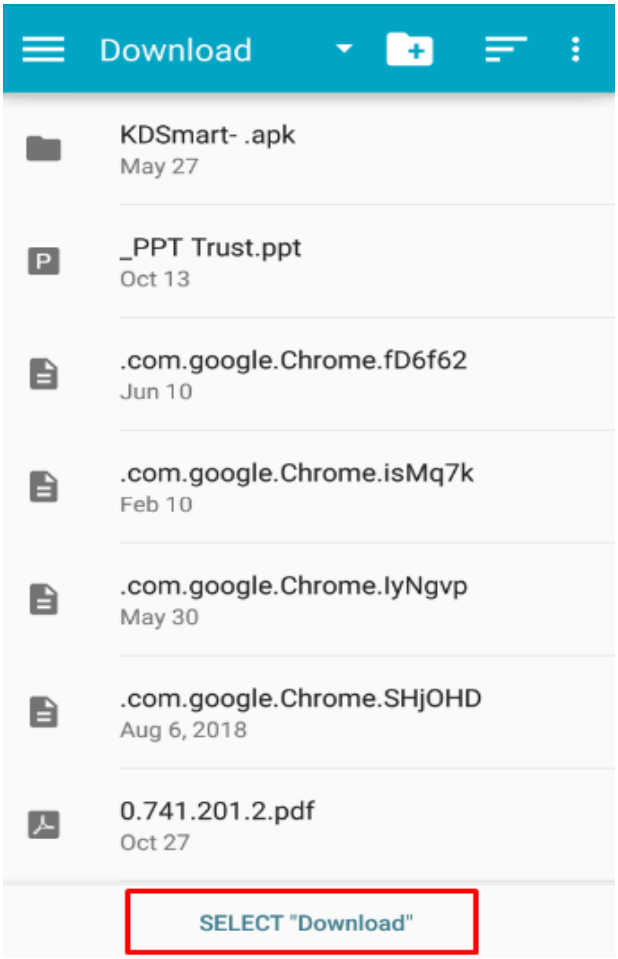
1. Click on the three dots at the top left of KDSmart screen. 1
2. Select “Trials”. 2



3. In the trial list, select the one you wish to export. Once selected it is highlighted in blue 1
4. At the top right of the screen, click on the three dots icon 2
5. Select “Export To” 3



6. Select “Device”.
7. Select “Full data” in Zip.
8. Select the folder where you want to store this file
9. Click “Select Download’’.



STEP 2. TRANSFER THE .ZIP FILE TO A LAPTOP

- **Via email**: from the mobile device, send an email to yourself with the .zip file attached. Open this email on a laptop and download the .zip file.

- **Via a cloud:** on the mobile device, save the .zip file on a cloud-based service (OneDrive, Dropbox, Google Drive). Open the same cloud-based service on a laptop and download the .zip file.

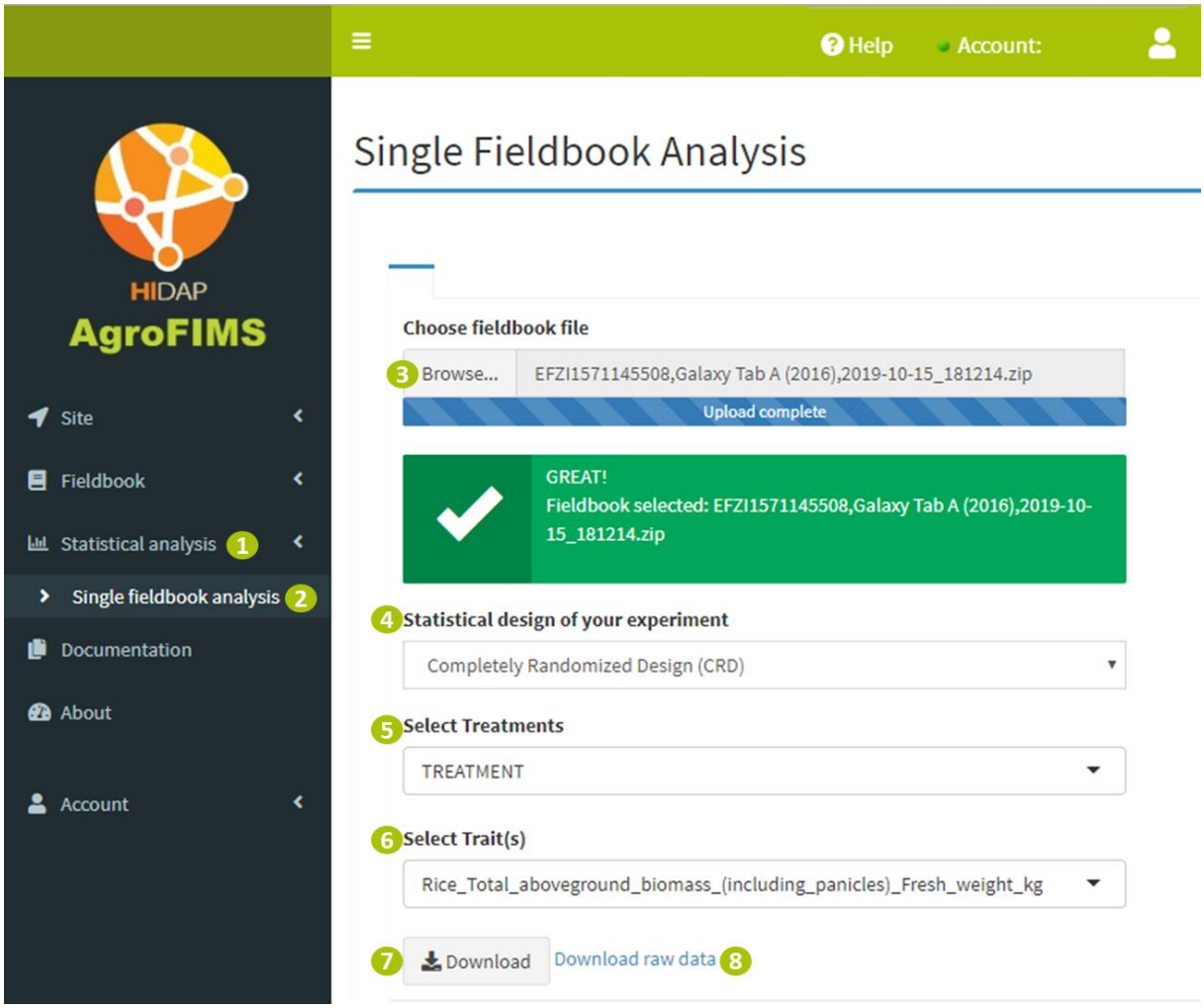
- **Via USB transfer**: connect the mobile device to a laptop. Save the .zip file on the laptop.

STEP 3. OPEN THE .ZIP FILE IN AGROFIMS

1. In AgroFIMS, select Statistical analysis 1 > Single fieldbook analysis 2 in the Menu.
2. Click on "Browse…'' 3
3. Select the .zip file and click Open
4. Choose the statistical design of the experiment 4
5. Select TREATMENT in the box "Select Treatments" 5
6. Select the trait you want to analysis 6

7.a. Click "Download" to get a statistical report 7

7.b. Click "Download raw data" 8 to get an Excel file, called ''RowData '' with all the data collected in the field.



Content of the RowData Excel file tabs

Excel file tab name	Origin of the data
Metadata	Information from the AgroFIMS sections: Experiment, Personal, Site, Crop and Design - Not modified in the mobile application
Protocol	All the information given in the AgroFIMS Management Practices section - Not modified in the mobile applciation
Notes_Deviations	Unexpected events that happened in the field during the experiment and noted with KDSmart
Crop_measurements	Crop measurements collected in the field with KDSmart
Residue management Seedbed preparation Fertilizer management Planting_transplanting Mulch_management Irrigation Weeding Harvest	Data describing management practices done in the field and noted in KDSmart
Phenology	Phenology measurements collected in the field with KDSmart
Weather	Weather measurements selected in AgroFIMS. The data collected via sensor or weather station can be pasted in this tab
Soil	Soil measurements collected in the field with KDSmart
TraitList	Details on all the measurements collected in the field with their unit, validation rule, data type, timing. Biotic and abiotic variables are also automatically listed here to be available in the data collection tool if needed.
for_analysis	All data collected in the field with KDSmart are gathered in this tab

Timestamp

All the traits collected in the field with KDSmart are accompanied by a timestamp called TIMESTAMP_TraitName. This timestamp reflects the exact date and time at which the data have been entered in the mobile application.

DATA ARCHIVING

Once you have generated a RowData Excel file with your collected data, you can save it either on your institutional repository or on your own repository.

agrofims@cgiar.org

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