

DiverCILand

(Diversity of Crops In Landscape)

v2.0

User Guide
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A. Introduction

A.1 Context

To be completed (project summary, information on the creation of the tool,...)

A.2 DiverCILand

A.2.a Login page

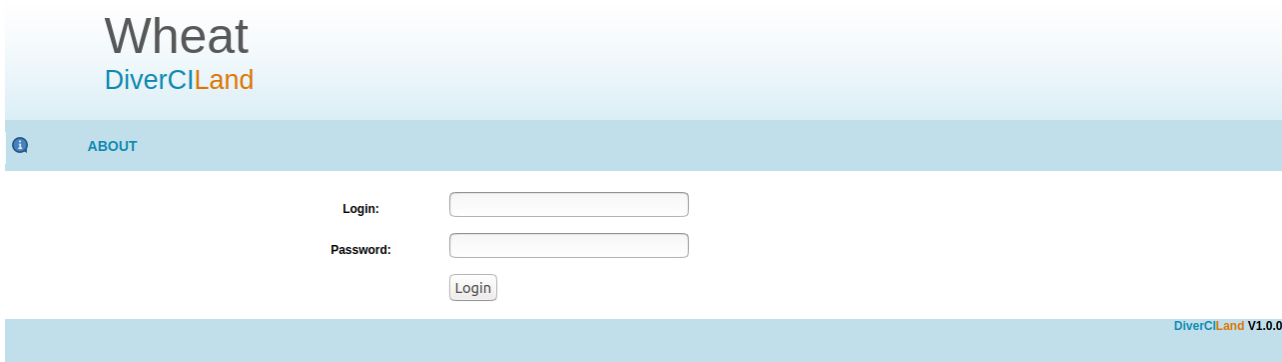


Figure 1: Login page

To access DiverCILand, a user account is needed. Accounts can be created by data administrators and admin users. Without user account, it is possible to access information on the database and user documentation.

A.2.b Home page



The overall goal of RustWatch is to establish a stakeholder-driven early warning system for yellow rust, leaf rust and stem rust on wheat to improve preparedness and resilience to emerging plant diseases in European bread and feed wheat and durum production. The early warning system will consist of shared rust diagnostic facilities and stakeholder networks within research, plant breeding, disease management, and agricultural advisory services, engaging in monitoring, sampling, data sharing and transfer of knowledge and alerts to end-users.

The concept of the project is to seek European solutions to solve challenges caused by wheat rust disease (yellow-, leaf- and stem rust) - emerging pathogens which spread across national borders and affect major food crops in EU member states. This involves interdisciplinary collaboration between plant pathology, breeding, agronomy, agro-chemistry, molecular genetics and Information and Communication Technologies (ICT), i.e., to increase the expertise and efficiency in rust monitoring within these stakeholder networks. Research activities will interact at all these steps and will involve two-way communication with stakeholders, recognizing their expertise to resistance breeding, disease surveillance and pathogen sampling. PM-based disease management will involve project partners as well as larger lead users by linking with pre-existing stakeholder networks within plant breeding, value-for-cultivation-and-use (VCU) trials, agricultural advisory services and the agrochemical industry

Figure 2: Home page

Once logged in, the home page of the application is displayed. On this page, there is a research bar that allow to search among objects in the database (more information on the research bar in the Dataview part). There are also several tabs that allow navigation in the application.

Home

The first tab is Home, this page displays general information on the database and logos of the partner units and projects.

Dataview

This tab contains DiverCILand's data visualization interfaces. A chapter of the documentation is devoted to the description of the submenus and features of this tab.

Admin

The admin tab is visible only for the users with administrator status. As indicated by his name, this tab contains features to administrate data. All the submenus of this tab are detailed in a specific chapter of this documentation.

User profile

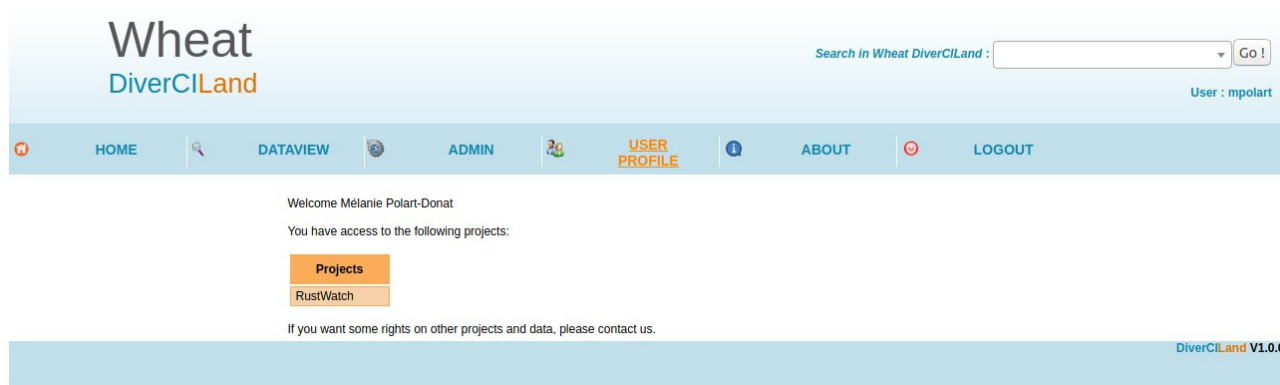


Figure 3: User profile

The user profile page indicates the projects to which the user has access, to visualize data in the dataview interfaces of the database.

About

The submenus of this tab provide information on DiverCILand. The help tab give access to the user's documentation.

Logout

A click on this tab will allow a user to disconnect from the database.

B. Administration

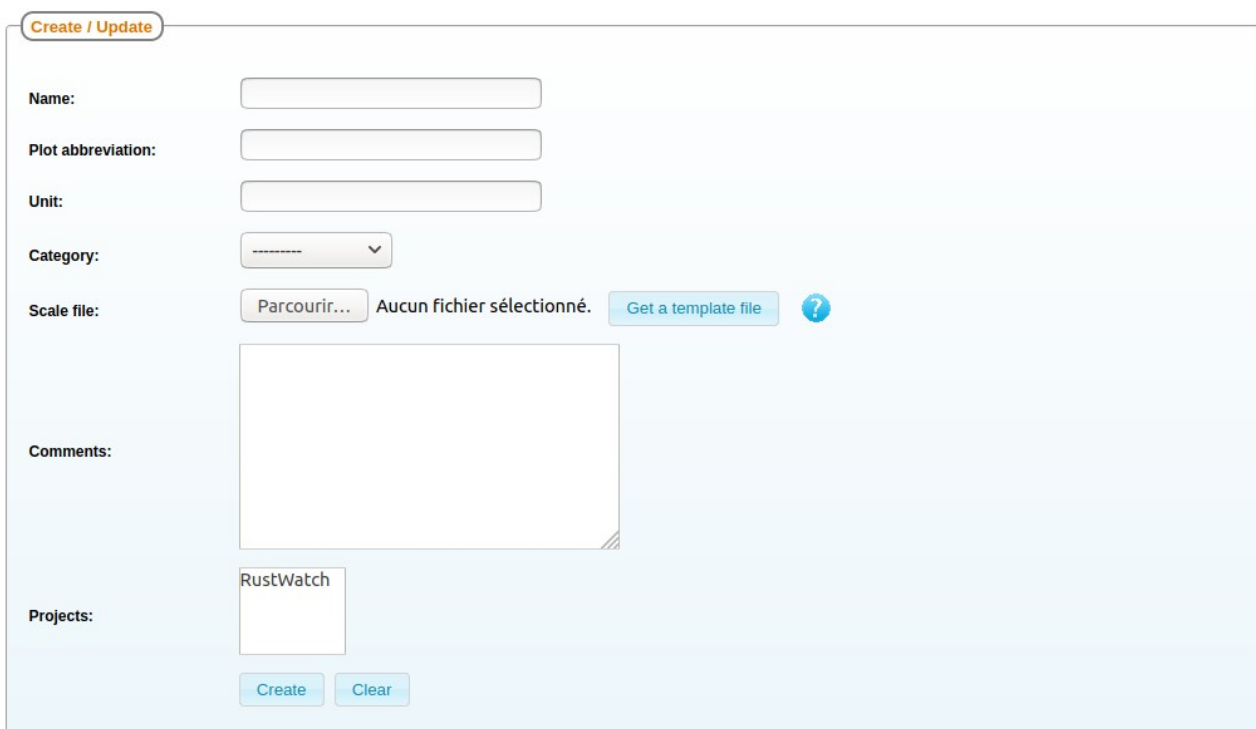
The admin menu allows the user to load, update and delete data. To access this menu the users must have an administrator status.

B.1 Admin interfaces

In the admin menu, the management interfaces follows the same template. A standard admin view is composed of a form and a table. On certain views there is also functionalities to load a file between the form and the table.

B.1.a Form

Trait Management



The screenshot shows a web form titled "Trait Management" with a "Create / Update" tab. The form contains the following fields and controls:

- Name:** A text input field.
- Plot abbreviation:** A text input field.
- Unit:** A text input field.
- Category:** A dropdown menu with a downward arrow.
- Scale file:** A file selection area with a "Parcourir..." button, the text "Aucun fichier sélectionné.", a "Get a template file" button, and a help icon (question mark in a circle).
- Comments:** A large text area for entering comments.
- Projects:** A dropdown menu with "RustWatch" selected.

At the bottom of the form, there are two buttons: "Create" and "Clear".

Figure 4: Example of a management form

In management mode, the form allows the user to create an object. In edition mode, the user can modify information of the considered object and update it.

In the forms, all the fields are not mandatory. If a mandatory field is not filled or if there is an error, the form will return error messages, allowing the user to modify the information.

B.1.b Table

The screenshot shows an administrative interface for a table. At the top left, there is a 'View' button. Below it, the 'REFINE SEARCH:' section includes an 'Add' button, a search condition selector (AND/OR), a dropdown menu for the search column (currently set to 'name'), and a search input field. There are 'Search' and 'Back' buttons. On the right, the 'EXPORT:' section has an 'Export table in CSV' button. Below the search section, there are checkboxes for 'Tick all' and 'Delete selected', a 'Page 1 of 1' indicator, and a 'Number of elements to display per page (50 by default):' selector with options 10, 50, 100, 200, and ALL, and a 'Display' button. A 'Page number:' field with a 'go' button and 'Number of data: 1-3 / 3' is also present. The table below has the following data:

| Edit/Delete | Name | Plot abbreviation | Unit | Category | Scale file | Comments | Projects |
|--------------------------|-------------|-------------------|------|---------------|------------|----------|-----------|
| <input type="checkbox"/> | Leaf rust | LR | | Discontinuous | | | RustWatch |
| <input type="checkbox"/> | Stem rust | SR | | Discontinuous | | | RustWatch |
| <input type="checkbox"/> | Yellow rust | YR | | Discontinuous | | | RustWatch |

Figure 5: Example of an admin table

The table contains all the objects of the database for the considered data type. There are several functionalities associated with the table.

On the left corner there is the « Refine Search » functionality. It allows the user to search for key words in the table. To search, it is necessary to select the name of the column the user wants to search in. Multiple searches can be done at the same time by clicking on the « add » button. That will add a new search form. When several search forms are completed, the condition of the search must be selected : AND / OR (the default value is AND).

On the right corner, there is the export function. It allows to export the table in CSV format by clicking on the icon. When the table is filtered by the « refine search », the result of the search can also be exported.

By clicking on the names of the columns, it is possible to re-order data in the table. For example, a click on the column “Name”, will order the names alphabetically.

Pagination functionalities are displayed on the top of the table. If there is more than 50 lines of data, the table is automatically divided in several pages. The user can select how many lines must be displayed by page and navigate through the pages via these options. The « Tick all » function allows to tick all the lines of the current page. The « Delete selected » function will delete all the ticked lines of the current page.

On the table itself, operations can be done on each lines. By clicking on the icon, the user can delete a line of data. The icon allows the edition of the data line. On click, the view will change in edition mode and the form on top of the page will contains the information of the object. The user can now modify the information, click on « update » to save, and go back on management mode.

B.1.c Load from file

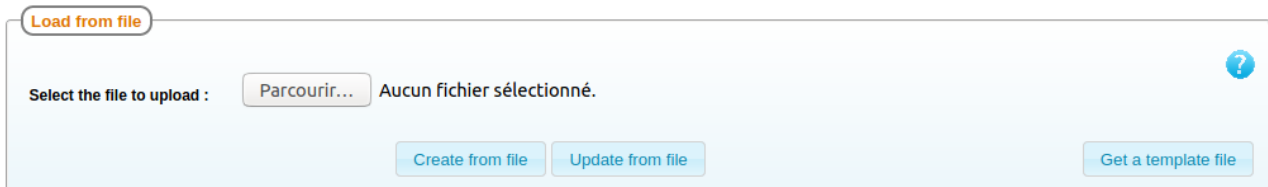




Figure 6: Example of a “Load from file” section

On some views, there is a « Load from file » section on the page that allows to load several data on one time in the database, via a file.

On this part, the user can get a « template file », an empty file containing only the headers to see the structure needed for the file. A hover on the  icon will provide information on how to fill the file.

When a file is selected in the browser, the user can « Create from file » or « Update from file ». The « Create from file » option needs a file with only new data to insert in the database. If some existing data are in the file, the operation will return an error. To use « Update from file » the file must contains only existing data to update. If the file contains new data, the operation will return an error. All fields can not be updated via the file update. If so, it will be specified on the  icon.

B.1.d Messages

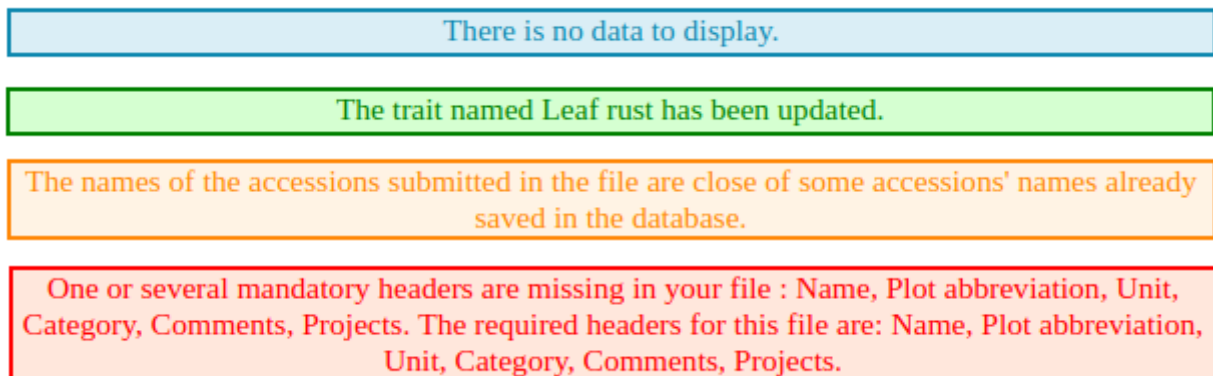


Figure 7: Examples of messages displayed in DiverCILand

In DiverCILand, the majority of actions made in the database: query, file insertion, data update, etc. will return messages. These messages will appear on top of the forms or dataview windows, or at several other locations in the application. They will have different levels of importance depending on their color. There are four colors of messages:

Blue

This type of messages provide information.

Green

The green messages indicate the success of the operations requested by the user.

Orange

These are warning messages indicating to the user an instruction to follow or, for example, that only part of what had been requested has been carried out.

Red

The red messages are error messages. Usually, they indicate that the requested action could not be performed and give details of the problems encountered.

B.2 Users

This menu gather the functionalities to manage users, persons and institutions.

B.2.a Institution

Institution Management

Create / Update

Name:

Acronym:

Address:

Postal code:

City:

Country:

Web site:

Email address:

View

REFINE SEARCH:

+ [Add](#)

Condition to apply to the search: AND OR

name

Tick all Delete selected

Page 1 of 1.

Number of elements to display per page (50 by default): 10 50 100 200 ALL

Page number: Number of data: 1-1 / 1

| Edit/Delete | Name | Acronym | Address | Postal code | City | Country | Web site | Email address |
|--|-------|---------|---------|-------------|------|---------|----------|---------------|
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | INRAE | | | | | FR | | |

Figure 8: Institution page

In the database, you can create institutions that will be selectable when creating a Person or a Project.

The form to create an institution is composed of the following fields :

- Name *

- Acronym
 - Address
 - Postal code
 - City
 - Country
 - Web site
 - Email address
- * : Mandatory fields

All the institutions saved in the database can be found in the table at the bottom of the page.

B.2.b Person

Person Management

Create / Update

First name:

Last name:

Initial:

Title of person:

Other language:

Work phone:

Work extension:

Fax number:

Email address:

Note on person:

Institutions:

View

REFINE SEARCH:

[Add](#)

Condition to apply to the search: AND OR

first name

Tick all Delete selected

Page 1 of 1.

Number of elements to display per page (50 by default): 10 50 100 200 ALL

Page number: Number of data: 1-6 / 6

| Edit/Delete | First name | Last name | Initial | Title of person | Other language | Work phone | Work extension | Fax number | |
|--|------------|--------------|---------|-----------------|----------------|------------|----------------|------------|-------|
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Dario | Fossati | | | | | | | daric |
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Florence | Dubs | | | | | | | |
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Jerôme | Enjalbert | | | | | | | |
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Mélanie | Polart-Donat | | | | | | | |
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Read | Only | | | | | | | |
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Yannick | De Oliveira | | | | | | | |

Figure 9: Person page

The application allows to manage Personal data in the database. A Person can be linked to a user account, and in that case it contains personal and contact information of the user, but not necessarily. It can be use to reference to a person that does not have a user account, for example people who produced data stored in the database.

The form to create a person is composed of the following fields :

- First name *
- Last name *
- Initial
- Title of person
- Other language
- Work phone
- Work extension
- Fax number
- Email address
- Note on person
- Institutions *

* : Mandatory fields

B.2.c User

User Management

Create / Update

First name:

Last name:

Login:

Password:

Is admin:

View

REFINE SEARCH:

+ [Add](#)

Condition to apply to the search: AND OR

login

Tick all Delete selected

Page 1 of 1.

Number of elements to display per page (50 by default):

10 50 100 200 ALL

Page number: Number of data: 1-6 / 6

| Edit/Delete | Login | Person | Is admin |
|--|------------|----------------------|----------|
| <input type="checkbox"/> <input checked="" type="checkbox"/> | dfossati | Dario Fossati | False |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | fdubs | Florence Dubs | True |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | jenjalbert | Jerôme Enjalbert | True |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | mpolart | Mélanie Polart-Donat | True |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | rouser | Read Only | False |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | yannick | Yannick De Oliveira | True |

Figure 10: User page

To create a new user, the following form fields are displayed:

- First name *
- Last name *
- Login *
- Password *
- Is admin

* : Mandatory fields

The first name and last name fields correspond to the first name and last name of a person. If the user is already saved as a Person in the database, the created user account will be linked to the

person with the same name. If the user is new to the database, when the user form will be submitted, a person will be automatically created and linked to the user account.

A user can have two status in DiverCILand, administrator or read only.

The admin users will have access to the admin section of the database, where the data can be loaded, managed and deleted. To give admin rights to a user, the “Is admin” box must be checked. An admin user will have access to the two sections of the application : Admin and Dataview.

If the “Is admin” box is unchecked, the user will have read only rights, they will not have access to the admin section but they will have access to the dataview section.

The rights can be updated via the edition of the user account.

B.3 Projects

This menu gather the functionalities to manage projects and to manage the links between projects and data.

B.3.a Project

Project Management

Create / Update

Name:

Authors:

Start date:

End date:

Funding:

Description:

Users:

Institutions:

View

REFINE SEARCH: **EXPORT:**

Condition to apply to the search: AND OR

name

Tick all Delete selected

Page 1 of 1. Page number: Number of data: 1-1 / 1

Number of elements to display per page (50 by default):
 10 50 100 200 ALL

| Edit/Delete | Name | Authors | Start date | End date | Funding | Description | Users |
|--|-----------|---------|------------|----------|---------|-------------|---|
| <input type="button" value="Edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | RustWatch | xxx | 2020-07-01 | | | | fdubs, jenjalbert, mpolart, rouser, yannick |

Figure 11: Project page

In DiverCILand, data is linked to projects. A project will therefore contain all the data associated with it, and this will contribute to data privacy. Only the users that are added to the project will be able to visualize the data associated to the project in dataview mode. To create a project, the following form fields are displayed:

- Name *
- Authors *
- Start date *
- End date
- Description
- Users *
- Institutions *

* : Mandatory fields

At least one user must be selected to create the project. The project can be edited to add new users.

B.4 Accession

This menu gather functionalities to manage accessions information and data.

B.4.a Accession type

Accession Type Management

Create / Update

Name:

Description:

Category: ▾

Descriptors: ?

View

Tick all
 Delete selected

Number of elements to display per page (50 by default):
 10
 50
 100
 200
 ALL

Page number:
 Number of data: 1

| Edit/Delete | Name | Description | Category | Descriptors |
|--|------|-------------|----------|-------------|
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Type | | Default | |

Figure 12: Accession type page

In order to store accessions, at least one accession type must be created at first. The accession type represents a group of accessions. To create an accession type, the following form fields are displayed:

- Name *
- Description
- Category *: The category represents the “type” of the accession type, and will be used to calculate indicators.
- Descriptors: The descriptors are personalized forms fields for the type’s accessions, created by admin users in “Define descriptors” menu.

* : Mandatory fields

When the accessions type is created, it is displayed on the left side menu of the application, under accessions. A click on this menu allows to access the management page of this type’s accessions.

B.4.b Descriptors

Accession Descriptors Management

Create / Update

Attribute name:

Type: ▼

View

Tick all Delete selected
 Number of elements to display per page (50 by default):
 10 50 100 200 ALL

Page number: Number of data: 1

| Edit/Delete | Attribute name | Type |
|--|----------------|------------|
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Seasonal type | Short Text |

Figure 13: Accessions’ descriptors page

The descriptors menu allows the user to create personalized form fields that can be displayed in the Accession menu. These fields can contain information of different types. To create a descriptor the user must specify:

- Attribute name *: Name of the field
- Type *: Type of data to store in the field (short text, long text, number or URL)

* : Mandatory fields

To be used, the descriptors must be assigned to accession types via “Descriptors” field on accession type management page. Once the descriptor has been assigned to an accession type, the new field is displayed on the form and table of the accession type’s accession management page.

If a descriptor is deleted, all the data associated to this descriptors for all accession types will be deleted.

B.4.c Accession

Type Accession Management

The image shows two distinct form sections for managing accessions. The first section, titled "Create / Update", is a form with several input fields: "Name:", "Breeder:", "Country:" (a dropdown menu), "Inscription date:", "Maintainer:", "Synonym:", and "Description:". Below these fields are two "Projects:" boxes, one of which contains the text "RustWatch". At the bottom of this section are "Create" and "Clear" buttons. The second section, titled "Load from file", features a "Select the file to upload :" label, a "Parcourir..." button, and the text "Aucun fichier sélectionné.". It also includes a help icon (question mark in a circle) and three buttons at the bottom: "Create from file", "Update from file", and "Get a template file".

Figure 14: Accession page forms

A click on an accession type name on the left menu shows accession management page. All the accessions created on this page will belong to the selected type. The form (or file template) to create an accession is composed of the following fields:

- Name *
- Breeder
- Country *
- Inscription date *
- Maintainer

- Synonym
- Description
- Projects
- + Descriptors (if some have been assigned to the accession type)

* : Mandatory fields

It is also possible to directly load a file containing all the accessions to create in the “Load from file” menu. The template of the file is available on click on “Get a template file”.

To update several accessions at the same time with a file, the “Update from file” option can be used. This file must contain only existing accessions. (More information on this menu on the Admin Interfaces part of the documentation).

B.4.d Insert data

Two methods are possible to insert accession data in the database. From the accession type page, with the “Load from file option”, as explained in the previous paragraph, but all the accessions must be of the same type. To load accessions of different types, it is possible to use the “Insert multi-type accessions” menu.

Insert all types of accessions

The screenshot shows a web interface for uploading a file. At the top left, there is a tab labeled "Load from file". Below it, the text "Select the file to upload :" is followed by a "Parcourir..." button and the text "Aucun fichier sélectionné.". To the right of this text is a blue question mark icon. At the bottom of the form, there are three buttons: "Create from file", "Update from file", and "Get a template file".

Figure 15: Insert all types of accessions form

On this menu, it is possible to load a file containing accessions to create or update on the database. The file must contain all the information on the accessions listed in the Accession paragraph plus a “Type” field to specify the type of the accession. It is also possible to load accessions of the same type on this menu since the “Type” field is filled in.

B.5 Landscape

Variety deployment data are stored in this section of the application.

B.5.a Land unit

Land Unit Management

The screenshot displays two forms for land unit management. The first form, titled "Create / Update", contains four input fields: "Name:" (text), "Country:" (dropdown), "Nuts:" (dropdown), and "Code:" (text). Below these fields are two buttons: "Create" and "Clear". The second form, titled "Load from file", features a "Select the file to upload:" label, a "Parcourir..." button, and the text "Aucun fichier sélectionné." To the right is a help icon. At the bottom of this form are three buttons: "Create from file", "Update from file", and "Get a template file".

Figure 16: Land unit page forms

The first object to create to manage variety deployment data is the land unit. The land unit represents a country or a part of a country (such as French régions or départements), on which variety repartitions are collected.

The form (or file template) to create a land unit is composed of the following fields:

- Name *
- Country *
- NUTS *
- Code

* : Mandatory fields

To specify the category of a land unit, the NUTS (Nomenclature of Territorial Units for Statistics) system is used. It's a geocode standard, to reference the subdivisions of countries for statistical countries. To find the appropriate level of NUTS for your land unit you can use this link:

https://en.wikipedia.org/wiki/Nomenclature_of_Territorial_Units_for_Statistics

The "Code" field can be used to store the national code of your land unit if necessary.

The land units can be created by the form or submitted in a file thanks to the "Load from file" menu. The template of the file is available on click on "Get a template file". To update several land units at the same time with a file, the "Update from file" option can be used. This file must contain only existing land units. (More information on this menu on the Admin Interfaces part of the documentation).

B.5.b Tag

Tag Management

Create / Update

Name:

Description:

View

Tick all Delete selected

Number of elements to display per page (50 by default):

10 50 100 200 ALL

Page number: Number of data: 4

| Edit/Delete | Name | Description |
|--|-----------------------------------|-------------|
| <input type="checkbox"/> <input checked="" type="checkbox"/> | spring wheat | |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | spring wheat and spring wheat_bio | |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | winter wheat | |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | winter wheat and winter wheat_bio | |

Figure 17: Tag page

The tag management menu allows the user to add or store information to the annual area and variety repartition parts of the application. On this menu, the user can create tags which can be added to variety repartition menu as a list of key words, and as new columns for annual area menu.

To create a tag the user must specify:

- Name *
- Description

* : Mandatory fields

Tags provide information in two different ways. In the annual area menu, the tags can be selected in the form and added as new columns in order to store other information for annual area data lines. In the variety repartition menu, the tags are added as keywords in the column Tag, they directly represents information. If a tag is deleted, it will disappear of the Tag column if used in the Variety repartition menu, or if it is used in the Annual area menu, all the information linked to this tag will be deleted.

B.5.c Annual area

Annual Area Management

The image shows two distinct forms for managing annual areas. The top form, titled "Create / Update", contains several input fields: "Land unit" (a dropdown menu), "Year" (a text input with a calendar icon), "Deployment" (a text input with a calendar icon), "Unit" (a dropdown menu currently set to "Hectare"), and "Description" (a large text area). Below these is a "Select tags" section with a text input and an "Add" button. At the bottom of this form are "Create" and "Clear" buttons. The bottom form, titled "Load from file", features a "Select the file to upload" section with a "Parcourir..." button and the text "Aucun fichier sélectionné.". Below this are three buttons: "Create from file", "Update from file", and "Get a template file". Both forms include a help icon (a question mark in a blue circle) in the top right corner.

Figure 18: Annual area page forms

In DiverCILand, annual area objects represents the total deployment value for a land unit on a year. These information allows the database to compute values for the varieties repartitions (the computations will be detailed in the Variety repartition part of the documentation). The form (or file template) to create an annual area is composed of the following fields:

- Land unit *
- Year *
- Deployment *
- Unit *: to select among: Hectare, Tonne, Kilogram, Quintal. If you want to add a unit to this list, please contact an administrator
- Description
- + Tags (if some have been selected)

* : Mandatory fields

The annual areas can be created by the form or submitted in a file thanks to the “Load from file” menu. The template of the file is available on click on “Get a template file”. To update several annual areas at the same time with a file, the “Update from file” option can be used. This file must contain only existing annual areas. (More information on this menu on the Admin Interfaces part of the documentation).

The annual area submitted by the user with a file or from the form represents the cultivated deployment value on the land unit. These annual areas therefore have a “Cultivated” value for the Data type field. Annual areas can also represent the multiplied deployment value on the considered land unit and have a “Multiplied” value for the Data type field. These annual areas are created automatically by the database from the multiplied variety repartitions submitted by the user in the Variety repartition part of the application. It is not possible to edit or delete these lines. They will disappear if the variety repartitions which were used to calculate them are deleted.

The color code on the column deployment represent the source of the data:

- Black: Raw data submitted by the user
- Blue: Data computed by the database

Hovering over the deployment value displays the status of the data.

B.5.d Variety repartition

Variety Repartition Management

The image shows two screenshots of the 'Variety Repartition Management' form. The top screenshot is titled 'Create / Update' and contains the following fields: 'Land unit' (dropdown), 'Year' (text input with a calendar icon), 'Accession' (dropdown), 'Data type' (dropdown set to 'Cultivated'), 'Percentage' (text input with a percentage icon), 'Deployment' (text input with a percentage icon), 'Unit' (dropdown set to 'Hectare'), and 'Tags' (text input with a dropdown menu showing options: 'spring wheat', 'spring wheat and spring wheat_bio', 'winter wheat', and 'winter wheat and winter wheat_bio'). There are 'Create' and 'Clear' buttons at the bottom. The bottom screenshot is titled 'Load from file' and contains: 'Data type' (dropdown set to 'Cultivated'), a checkbox for 'The file contains calculated data', 'Select the file to upload' (file selector button showing 'Parcourir...' and 'Aucun fichier sélectionné.'), and buttons for 'Create from file', 'Update from file', and 'Get a template file'.

Figure 19: Variety repartition page forms

The variety repartition menu allows to store deployment data of varieties on annual areas. The form (or file template) to create an annual area is composed of the following fields:

- Land unit *
- Year *

- Accession *
- Data type *
- Percentage (*)
- Deployment (*)
- Unit *: to select among: Hectare, Tonne, Kilogram, Quintal. If you want to add a unit to this list, please contact an administrator
- Tags

* : Mandatory fields

The variety repartitions can be created by the form or submitted in a file thanks to the “Load from file” menu. It is not possible to edit this type of data from the form. The template of the file is available on click on “Get a template file”. To update several variety repartitions at the same time with a file, the “Update from file” option can be used. This file must contain only existing variety repartitions. (More information on this menu on the Admin Interfaces part of the documentation).

It is possible to submit cultivated or multiplied variety repartitions. On the “Load from file menu” according to the type of data, several options are displayed. These options will allow to select which calculations will be made by the database.

For a submission of a file containing cultivated varieties repartitions, you can select the option “Calculated data” if the data you insert in the database have already been calculated outside the database. In that case, if only the deployment percentage is provided in the file, the deployment value will not be calculated. If only the deployment value is provided, the percentage will be computed to represent data in dataview mode.

If “Calculated data” is not checked, when the file will be submitted, if only of the two values among deployment percentage or deployment value is provided, the other one will be automatically calculated by the database.

For a submission of a file containing multiplied variety repartition data, several options are displayed in the “Load from file” menu. As for cultivated data, it is possible to specify if data have been calculated outside of the database. By clicking on the “Calculate the cultivated deployment data for year n+1”, the database can estimate the cultivated deployment data of the N+1 year from the multiplied deployment data of the year N. If this option is not checked, the multiplied data will be saved and no estimations will be made.

With the option “Update from file” it is possible to update cultivated and multiplied data that are already saved in the database, by submitting again the file containing the variety repartitions with modified information.

It is also possible, for multiplied data already stored in the database, to estimate cultivated data for year N+1 by submitting the file again, check the box “ Calculate the cultivated deployment data for year n+1” and click on update from file. The multiplied data will be updated according to the content of the file and cultivated data for year N+1 will be computed.

As for annual areas, there is a color code on percentage and deployment columns, to represent the source of the data:

- **Black:** Raw data submitted by the user
- **Blue:** Data computed by the database
- **Green:** Calculated raw data submitted by the user

If variety repartition data are collected and submitted at country scale, that is to say, for a land unit with a NUTS level of 1, the data will directly be used in the visualization interfaces (Dataview part of DiverCILand). Else, if data has been submitted for a lowest level of NUTS, the database will automatically compute variety repartitions data at country scale, from user data, and create the land unit, annual areas to link the newly created general repartitions.

Those data will appear in the data table. It is not possible to delete or edit those lines of data. If the source data is updated, or part of the data is removed, the country level data will be updated as well, and if source data is deleted in totality, the general repartitions will also be deleted.

B.6 Phenotyping

This menu gather the functionalities to manage varieties' VCUS (Value for Cultivation, Use, and Sustainability) data, named here Catalogue data.

B.6.a Trait

Trait Management

Create / Update

Name:

Plot abbreviation:

Unit:

Category: ▼

Scale file: Aucun fichier sélectionné.

Comments:

Projects:

Load from file

Select the file to upload : Aucun fichier sélectionné.

Figure 20: Trait page forms

The first objects to define to manage catalogue data are the traits. The form (or file template) to create an trait in DiverCILand is composed of the following fields:

- Name *
- Plot abbreviation: The abbreviated name that will be displayed on plots
- Unit: Unit that will be displayed on plots
- Category *: More information below
- Scale file: More information below
- Comments
- Projects

* : Mandatory fields

The traits can be created by the form or submitted in a file thanks to the “Load from file” menu. The template of the file is available on click on “Get a template file”. To update several traits at the same time with a file, the “Update from file” option can be used. This file must contain only existing traits. (More information on this menu on the Admin Interfaces part of the documentation).

The category of the trait is to be chosen between: continuous, discontinuous or other, according to the trait that is measured. This information is used to display data in the dataview mode.

In DiverCILand’s phenotyping menu, catalogue data are submitted for each country, in the unit of the country. To display data for different countries on the same representation in the dataview mode, they must be converted. This is what the scale file is used for. In this file, the first column contains the values of the common scale, the second one the labels of the common scale values. After, each column represents a country, and all the values of the scale of each country must be placed in front of the corresponding values of the common scale. A template of the scale file can be downloaded on the trait form. This template is an example of scale file for data on the resistance against pathogene.

| Common Scale | Label | FR | UK | DE | ... |
|--------------|------------------------|----|----|----|-----|
| 5 | Resistant | | 9 | | |
| 4 | | 8 | 7 | | |
| 3 | Moderately susceptible | | | | |
| 2 | | | | | |
| 1 | Susceptible | | | | |

Figure 21: Scale file template

The actual scale file of a trait is downloadable on the data table of the trait management page, in the column scale file. It is possible, when updating a trait from the form to delete or replace the file, in order to update it.

The scale file is not mandatory but if it is not provided, the catalogue data linked to this trait will not be represented on the dataview mode on the multi country representations.

B.6.b Method

Method Management

Create / Update

Name:

Description:

View

REFINE SEARCH: **EXPORT:**

[Add](#)

Condition to apply to the search: AND OR

name

Tick all Delete selected

Page 1 of 1

Number of elements to display per page (50 by default):
 10 50 100 200 ALL

Page number: Number of data: 1-1 / 1

| Edit/Delete | Name | Description |
|--|--------------------|-------------|
| <input type="button" value="Edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Direct observation | mesure |

Figure 22: Method page

In the method menu, the user can create methods to store information on how catalogue data have been gathered. To create a method, the following form fields are displayed:

- Name *
 - Description
- * : Mandatory fields

Created methods can then be linked to catalogue data in the “Insert catalogue data” part of the application.

When a method is deleted, all the catalogue data linked to this method will be deleted as well.

B.6.c Insert catalogue data

Insert catalogue data

The figure displays two screenshots of a web form titled "Insert catalogue data".

The top screenshot, labeled "Insert from file", shows a form with a "Country:" dropdown menu set to "Choose a Country". Below it is a "Select the file to upload:" section with a "Parcourir..." button and the text "Aucun fichier sélectionné.". At the bottom right, there are two buttons: "Create from file" and "Get a template file". A blue question mark icon is in the top right corner.


The bottom screenshot, labeled "Insert data updates from file", shows a similar form but with additional dropdown menus: "Trait:" set to "Choose a Trait" and "Method:" set to "No method". The "Select the file to upload:" section and the bottom buttons are identical to the top screenshot. A blue question mark icon is also present in the top right corner.

Figure 23: Insert catalogue data form

In this menu, to insert catalogue data, two file format are available.

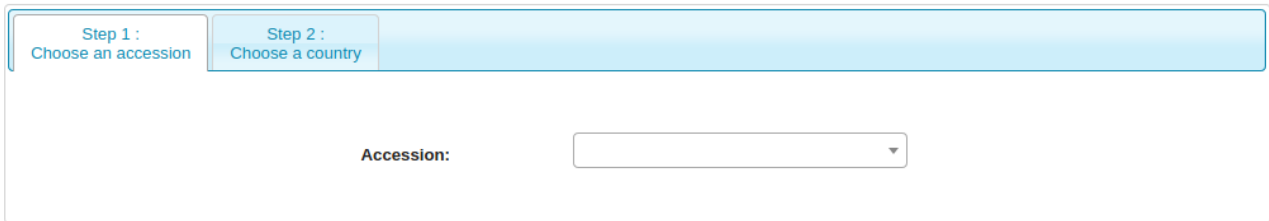
The first one, “Insert from file”, allow to submit catalogue data for one country, and for each accession for one year and several traits. This file format corresponds to the varieties registration format. The country is selected in the form. The first column of the file must contain accessions names, the second one the years, and the next columns contains the names of the traits. It is possible to link a method to the data of one trait, it is not mandatory. To do this, the name of the method should appear with the name of the trait, in the header column, in this form: trait name | method name. A template of this file is available to download on the page.

The second file format, “Insert data updates from file”, allow to submit catalogue data for one country, one trait and several years. This file format correspond to a tracking file of varieties’ catalogue data for one trait trough the years. The country, the trait and the method (optional) are selected in the form. The first column of the file contains accessions names and the other columns contains years (it is a matrix file: Accession / Years). A template of this file is available to download on the page.

More information on file formats, delimiter, etc. are available on the  icon.

B.6.d Edit catalogue data

Catalogue data Edit



Step 1 :
Choose an accession

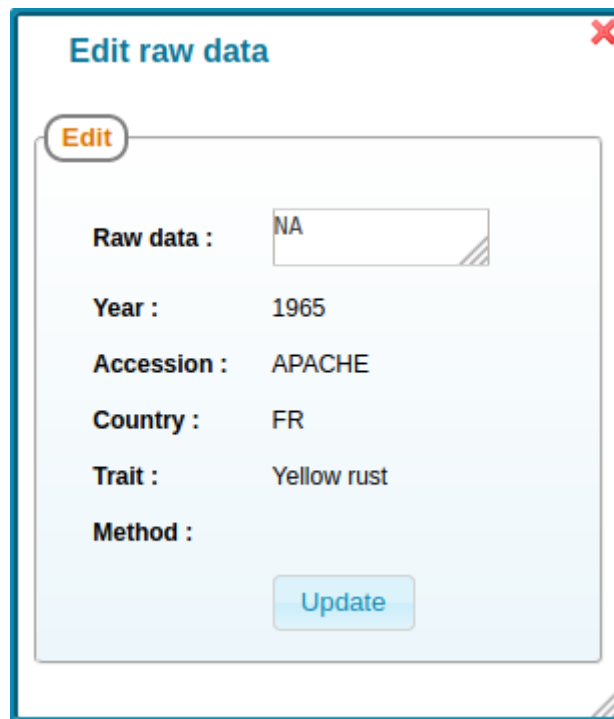
Step 2 :
Choose a country

Accession:

Figure 24: Catalogue data edit menu

When catalog data has been submitted to the database, it is possible, thanks to this menu to access catalogue data of an accession in a specific country in order to update a value. For that, it is necessary to select the desired accession in the first part of the form by unrolling the menu or typing the first letters of its name and then, the desired country on the next tab.

If catalogue data exists in the database for this combination, a table will appear, containing all catalogue data for the selected accession and country. With a click on a value, a pop up will appear, allowing to edit the data. By passing the mouse over a value, it is possible to see on which date it was created and the last modification date, as well as the login of the user who updated it.



Edit raw data ✕

Edit

Raw data :

Year : 1965

Accession : APACHE

Country : FR

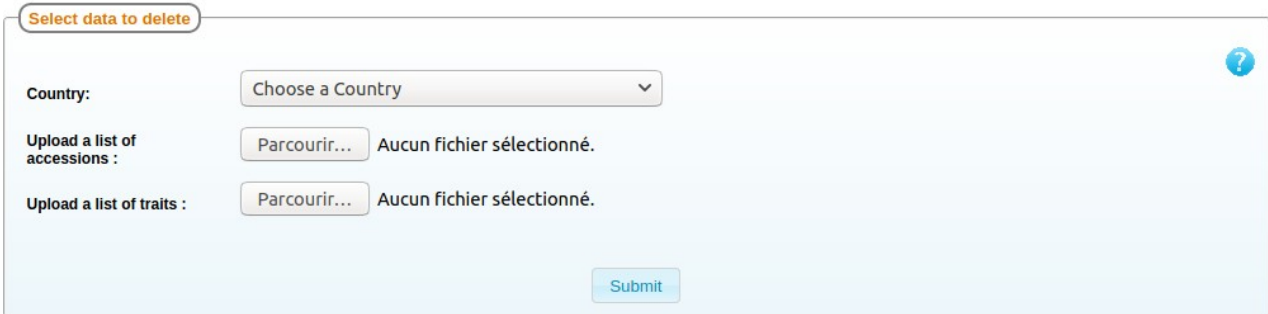
Trait : Yellow rust

Method :

Figure 25: Pop up allowing to update catalogue data

B.6.e Delete catalogue data

Delete catalogue data



The screenshot shows a web interface for deleting catalogue data. At the top left, there is a tab labeled "Select data to delete". Below this, the form includes a "Country:" label followed by a dropdown menu currently showing "Choose a Country". Underneath, there are two sections for file uploads: "Upload a list of accessions :" and "Upload a list of traits :". Each section has a "Parcourir..." button and the text "Aucun fichier sélectionné.". At the bottom right of the form area, there is a "Submit" button. A small blue question mark icon is visible in the top right corner of the form's container.

Figure 26: Delete catalogue data menu

This page brings together features to finely delete catalogue data with a query. It is possible to delete data for a country by providing a list of accessions and a list of traits for which catalogue data must be removed.

The lists of accessions and traits must be provided in files. In these files, the names can be separated by line breaks or various delimiters among this list: slash, comma, semicolon or tabulation. The format of the file can be CSV or TXT.

On the click on the submit button, the tool will return a confirmation page indicating the number of data found in the database according to the query. It is then possible to confirm or cancel the deletion

B.7 Genotyping

This menu gather functionalities to manage locus information and data.

B.7.a Locus type

Locus Type Management

Create / Update

Name:

Description:

Positioned: ?

Descriptors: ?

View

Tick all Delete selected
Number of elements to display per page (50 by default):
 10 50 100 200 ALL

Page number: Number of data: 2

| Edit/Delete | Name | Description | Positioned | Descriptors |
|--|--------------------|--|------------|-------------|
| <input type="checkbox"/> <input checked="" type="checkbox"/> | R_gene_postulation | R genes postulated by inoculation of a set of isolates | False | |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | SNP | | True | Primer |

Figure 27: Locus type page

In order to store locus, at least one locus type must be created at first. The locus type represents a group of locus. To create a locus type, the following form fields are displayed:

- Name *
- Description
- Positioned: More information below
- Descriptors: The descriptors are personalized forms fields for the type's accessions, created by admin users in "Define descriptors" menu.

* : Mandatory fields

The "Positioned" check box allows to record position information on the locus when submitting locus of this locus type. If it is checked, the user will be able to fill the following fields when submitting locus: genome version, chromosome, position. If it is not, these fields will not appear in the locus management page of this type.

When the locus type is created, it is displayed on the left side menu of the application, under locus. A click on this menu allows to access the management page of this type's locus.

B.7.b Descriptors

Locus Descriptors Management

Create / Update

Attribute name:

Type: ▼

View

Tick all Delete selected

Number of elements to display per page (50 by default):

10 50 100 200 ALL

Page number: Number of data: 1

| Edit/Delete | Attribute name | Type |
|--|----------------|------------|
| <input type="button" value="edit"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Primer | Short Text |

Figure 28: Locus' descriptors page

The descriptors menu allows the user to create personalized form fields that can be displayed in the Locus menu. These fields can contain information of different types. To create a descriptor the user must specify:

- Attribute name *: Name of the field
- Type *: Type of data to store in the field (short text, long text, number or URL)

* : Mandatory fields

To be used, the descriptors must be assigned to locus types via “Descriptors” field on locus type management page. Once the descriptor has been assigned to a locus type, the new field is displayed on the form and table of the locus type's locus management page.

If a descriptor is deleted, all the data associated to this descriptors for all locus types will be deleted.

B.7.c Locus

SNP Locus Management

The image shows two forms for SNP Locus Management. The top form, titled "Create / Update", contains the following fields: "Name:" (text input), "Comments:" (text area), "Projects:" (dropdown menu with "RustWatch" selected), "Primer:" (text input), "Genome version:" (text input), "Chromosome:" (text input), and "Position:" (text input with a small icon on the right). Below these fields are "Create" and "Clear" buttons. The bottom form, titled "Load from file", contains a "Select the file to upload:" label, a "Parcourir..." button, and the text "Aucun fichier sélectionné." Below this are "Create from file", "Update from file", and "Get a template file" buttons. A help icon (?) is located in the top right corner of the "Load from file" form.

Figure 29: Locus page forms

A click on a locus type name on the left menu shows locus management page. All the locus created on this page will belong to the selected type. The form (or file template) to create a locus is composed of the following fields:

- Name *
- Comments
- Projects *
- + Descriptors (if some have been assigned to the locus type)
- Genome version (if the attribute “positioned” is checked for the locus type)
- Chromosome (if the attribute “positioned” is checked for the locus type)
- Position (if the attribute “positioned” is checked for the locus type)

* : Mandatory fields

It is also possible to directly load a file containing all the locus to create in the “Load from file” menu. The template of the file is available on click on “Get a template file”.

To update several locus at the same time with a file, the “Update from file” option can be used. This file must contain only existing locus. (More information on this menu on the Admin Interfaces part of the documentation).

B.7.d Experiments

Experiment Management

Create / Update

Name:

Institution:

Date:

Category:

Comments:

Projects:

View

REFINE SEARCH: **EXPORT:**
 Export table in CSV

Condition to apply to the search: AND OR

Tick all Delete selected

Page 1 of 1. Page number: Number of data: 1-2 / 2

Number of elements to display per page (50 by default): 10 50 100 200 ALL

| Edit/Delete | Name | Institution | Date | Category | Phenotyping file | Genotyping file | Isolat file |
|--|-------------|---|------------|-------------|------------------|-----------------|-------------|
| <input type="checkbox"/> <input checked="" type="checkbox"/> | Experiment1 | Institut National de la Recherche Agronomique | 2020-02-03 | Postulation | | | |
| <input type="checkbox"/> <input checked="" type="checkbox"/> | Experiment2 | Institut National de la Recherche Agronomique | 2020-02-24 | Genotyping | | | |

Figure 30: Experiment page

In the experiment menu, the user can create methods to store information on how genotyping or postulation data have been gathered. To create an experiment, the following form fields are displayed:


- Name *
- Institution *: To select among institutions created in the Users menu

- Date *
- Category *: More information below
- Comments
- Projects

* : Mandatory fields

The category of the experiment is to be chosen between Postulation or Genotyping, according to the type of data that will be linked to the experiment. If Postulation is chosen, it is possible to submit raw data files, that contains data associated to the postulation data that will be linked to the experiment. These files will not be processed, they will only be stored in the database.

Figure 31: Manage raw data files tab

The raw data files can then be exported from the table below, by clicking on the  icon in the corresponding column of the table. They can be removed or updated by editing the experiment.

Created experiments can then be linked to genotyping or postulation data in the “Insert experiment data” part of the application.

When an experiment is deleted, all the genotyping or postulation data linked to this experiment will be deleted as well.

B.7.e Insert data

Insert Experiment Data

Figure 32: Insert experiment data menu

In this menu, to insert genotyping or postulation data, two file formats are available.

The first one, the matrix file format, allows to submit genotyping or postulation data for a list of accessions and a list of locus. The first column of the file contains the accession’s names and the

first line, the locus' names. A template of this file is available on a click on "Get a matrix template file" menu. With this format it is not possible to submit the allelic frequency, the value is by default 1.

The second file format, the flat matrix file format, allows to submit genotyping or postulation data for a list of accessions and a list of locus, as the matrix file format, but it is possible to specify the value of allelic frequency. A template of this file is available on a click on "Get a flat matrix template file" menu.

To submit data, the user must select an experiment, that will be linked to the data, select the file format and upload the data file. More information on file formats, delimiter, etc. are available on the



icon.

C. Dataview

This menu contains all the data visualization interfaces of DiverCILand. It is accessible to all users. The data linked to projects will be available for visualization in this menu, data not linked to projects will not appear.

C.1 Search in DiverCILand

C.1.a Research bar



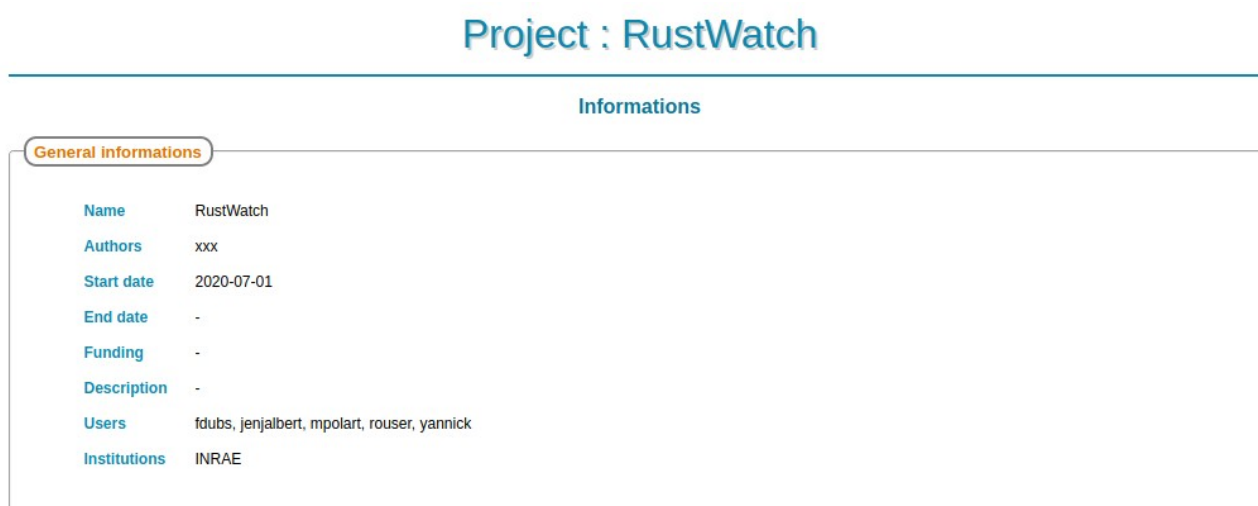
The image shows a search bar with the text "Search in Wheat DiverCILand :". To the right of the text is a text input field with a downward arrow on its right side. Further to the right is a button labeled "Go !".

Figure 33: Search bar

On the home page of DiverCILand, there is a research bar on the top right corner. On this research bar, it is possible to search for different category of data: projects, accessions, traits, experiments. The search bar field works with autocompletion to make it easier to find information.

Clicking on “Go” after selecting an element will redirect on the element’s data card.

C.1.b Data cards



The image shows a data card for a project titled "Project : RustWatch". The card has a header "Informations" and a sub-header "General informations". Below the sub-header is a table with the following information:

| | |
|--------------|---|
| Name | RustWatch |
| Authors | xxx |
| Start date | 2020-07-01 |
| End date | - |
| Funding | - |
| Description | - |
| Users | fdubs, jenjalbert, mpolart, rouser, yannick |
| Institutions | INRAE |

Figure 34: Example of a data card

The data card gathers the main information for varieties and other elements. Data cards are available for different category of data: projects, accessions, traits, experiments. The information displayed on the data card are not the same, depending of the category of data.

Projects

The project data card displays the main information of the projects: name, authors, start date, end date, funding, description, users and institutions.

If experiments of genotyping are linked to the project, they will appear in the “Experiments linked to this project” frame.

Accessions

Accession : APACHE

France

Informations

General informations

| Name | Accession type | Type | Breeder |
|--------|----------------|------|---------|
| APACHE | | | - |

Country informations

| | |
|------------------|-----------------------|
| Country | FR |
| Inscription date | 1998 |
| Maintainer | Limagrain Europe (FR) |
| Synonym | - |
| Description | winter wheat |
| Projects | RustWatch |

Accession type descriptors

There is no descriptors' data for this accession.

Catalogue data

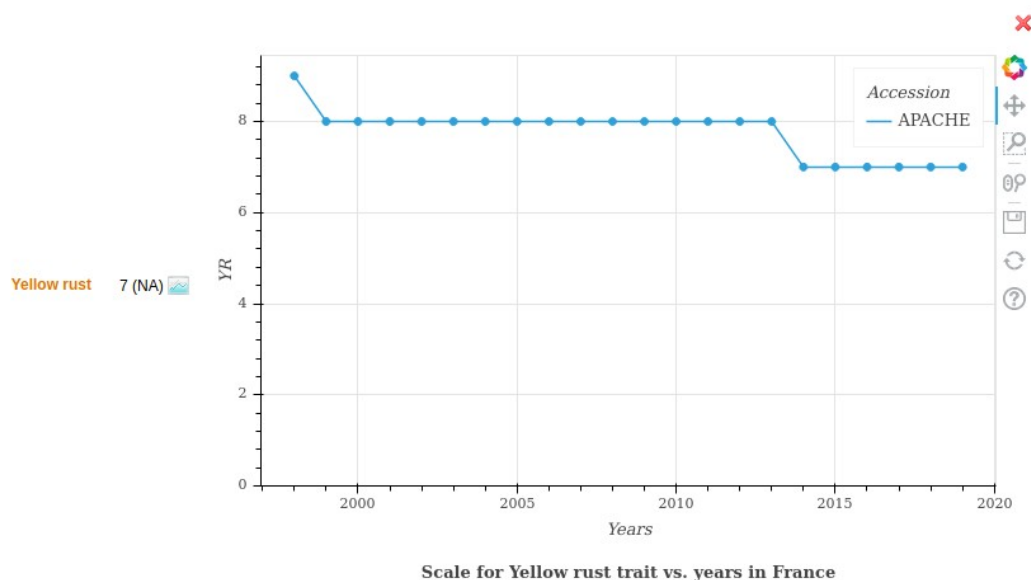



Figure 35: Accession data card

On this data card, accessions' information are displayed in three different frames. The first one, “General informations”, contains the name, type and breeder. This information does not change depending on the country. The second one, “Country informations”, contains data that is linked to the country, the inscription date, maintainer, synonym, description, projects. The third one is “Accession type descriptors”, this frame will contain the data that is entered in the special fields “descriptors”, added by the user. This information is also country bound.

In order to display information of accessions for different countries, there is a country selector on the right top corner of the data card. This selector will contain all the countries for which the accession have been registered. When changing the country with the selector, the data card will change to display information of the selected country.

The last frame is named “Catalogue data” and contains catalogue data linked to the accession, on the selected country. On this frame, the traits for which data exists in the database for the considered accession will be listed. Next to the name of the trait, the first value represents the most recent value for the trait, and the value in parentheses represent the oldest value saved in the database. By passing the mouse over the values, more information are displayed, the measurement date, creation date, last modification date and the name of the user who last updated the data. By clicking on the  icon, a graph will appear, representing the evolution of the values over time for the considered accession and trait. This graph will therefore contain all the data available in the database for this query.

Traits

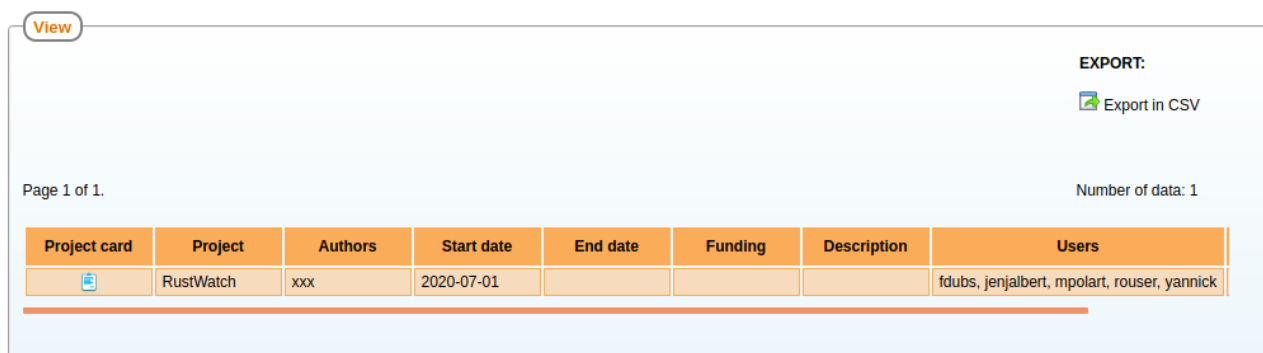
The trait data card displays the main information of the traits: name, plot abbreviation, unit, category, comments and projects.

Experiments

The experiment data card displays the main information of the experiments: name, institution, date, category, comments and projects.

C.2 Projects

Project Viewer






| Project card | Project | Authors | Start date | End date | Funding | Description | Users |
|---|-----------|---------|------------|----------|---------|-------------|--|
|  | RustWatch | xxx | 2020-07-01 | | | | fdubs, jenjalbert, mpolar, rouser, yannick |

Figure 36: Project viewer

The first dataview menu is projects. This menu displays a table in which all the existing projects of the database are listed along with their information. This table allows users to see which projects exists in order to be able to request access rights for those they wants to be part of.

On this table, it is possible to access the project’s data card by clicking on the  icon. It is also possible to export the table in CSV format by clicking on the  icon.

C.3 Accession

The second viewer of DiverCILand is the accession data viewer.

Accession Viewer

The screenshot shows a web form titled "Step 0 : Choose project(s)". It features a label "Project:" followed by a vertical list box containing the text "RustWatch". Below the list box is a checkbox labeled "Tick all". At the bottom of the form are two buttons: "Submit" and "Reset form".

Figure 37: Step 0 of the accession viewer: Choose project(s)

The first step on this menu is to select which projects the users wants to visualize the data. On this form, the user can select only the projects to which he has access to.

Accession Viewer

The screenshot shows a web form with two tabs: "Step 1 : Choose country" (active) and "Step 2 : Choose accession type(s)". The main content area has a label "Country:" followed by a vertical list box containing the following countries: Austria, Belgium, Czechia, Denmark, France, Germany, Hungary, and Italy. Below the list box is a checkbox labeled "Tick all".

Accession Viewer

The screenshot shows a web form with two tabs: "Step 1 : Choose country" and "Step 2 : Choose accession type(s)" (active). The main content area has a label "Accession type:" followed by a vertical list box containing the text "Type". Below the list box is a checkbox labeled "Tick all" and a "Submit" button.

Figure 38: Step 1 & 2 of the accession viewer: Choose countries and accession types

The second step is to select the country for which accession information should be displayed. It is possible to select all the countries with the “Tick all” option. And last, to select the types of accession that should be displayed.

Accession Viewer

View
EXPORT:
 Export in CSV

REFINE SEARCH:

+ [Add](#)

Condition to apply to the search: AND OR

name

Search
Back

Page 1 of 39. [Next](#) [Last](#)
 Number of elements to display per page (50 by default):
 10 50 100 200 ALL Display

Page number: go
Number of data: 1-50 / 1910

| Accession card | Accession | Type | Breeder | Country | Inscription date | |
|----------------|--|------|---------|---------|------------------|--|
| | 30-48 | Type | | FR | | |
| | 35-57 | Type | | FR | | |
| | 398_BONDEAU | Type | | FR | 1962 | |
| | 68_16 | Type | | FR | | |
| | 71_A | Type | | FR | | |
| | 73_3 | Type | | FR | | |
| | 79_24 | Type | | FR | | |
| | 999 | Type | | FR | | |
| | 999_998_VAR_MOLDAVE_DE_BL_DUR_CR_E_EN_1981 | Type | | FR | | |
| | AARON | Type | | FR | | |
| | ABANTO | Type | | FR | 1991 | |
| | ABANTO_2 | Type | | FR | | |
| | ABAQUE | Type | | FR | 2009 | |
| | ABBONDANZA | Type | | FR | | |
| | ABE | Type | | FR | 1977 | |
| | ABEL | Type | | FR | 1962 | |
| | ABO | Type | | FR | 1977 | |
| | ABOUKIR | Type | | FR | 1981 | |
| | ACANTO | Type | | FR | | |

Figure 39: Accession viewer result

When the form is submitted, a table appear, containing all the data matching the query that was made on the form. Only the main information about accessions are displayed. A click on the icon, allows to access the accession’s data card to visualize more detailed information.

On the top right corner there is the « Refine Search » functionality. It allows the user to search for key words in the table. To search, it is necessary to select the name of the column the user wants to search in. Multiple searches can be done at the same time by clicking on the « add » button. That will add a new search form. When several search forms are completed, the condition of the search must be selected : AND / OR (the default value is AND).

On the right corner, there is the export function. It allows to export the table in CSV format by clicking on the icon. When the table is filtered by the « refine search », the result of the search can also be exported.

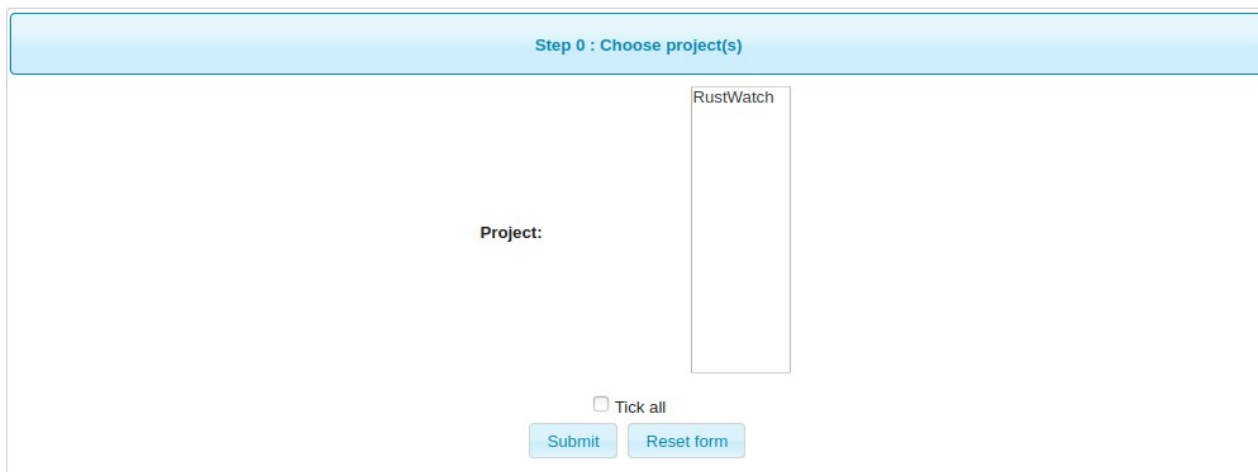
C.4 Landscape

Four types of data visualization are available for the landscape part of DiverCILand. Two of them are data representations on a map.

C.4.a Life cycle

The first menu is called life cycle and enable a representation of the life cycles of varieties, that is to say, the percentage of repartition of the varieties over time.

Life Cycle Viewer

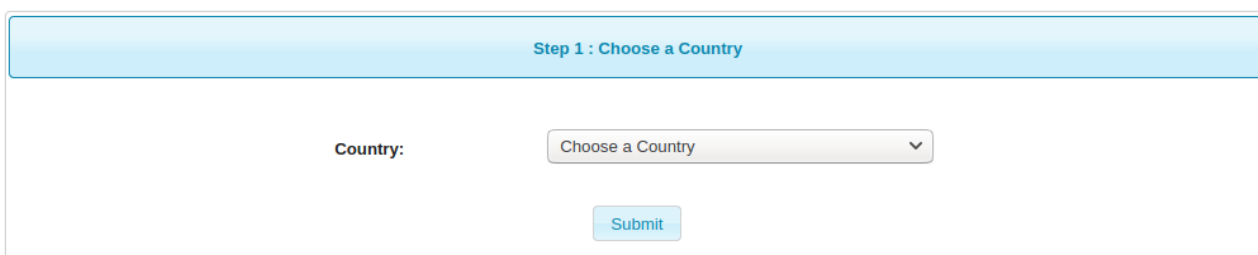


The screenshot shows a web form titled "Step 0 : Choose project(s)". It features a label "Project:" followed by a vertical list box containing the text "RustWatch". Below the list box is a checkbox labeled "Tick all". At the bottom of the form are two buttons: "Submit" and "Reset form".

Figure 40: Step 0 of the life cycle viewer: Choose project(s)

The first step on this menu is to select for which projects the users wants to visualize the data. On this form, the user can select only the projects to which he has access to.

Life Cycle Viewer



The screenshot shows a web form titled "Step 1 : Choose a Country". It features a label "Country:" followed by a dropdown menu with the text "Choose a Country" and a downward arrow. Below the dropdown menu is a "Submit" button.

Figure 41: Step 1 of the life cycle viewer: Choose a country

Life Cycle Viewer

Step 2 : Choose accession(s) Step 3 : Choose year(s)

Accession search:

- CAMP_REMY
- COURTOT
- FLORENCE_AURORE
- SCIPION
- HARDI
- MARIS_HUNTSMAN
- MELANGE
- SOISSONS

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Life Cycle Viewer

Step 2 : Choose accession(s) Step 3 : Choose year(s)

Year:

- 1981
- 1982
- 1983
- 1984
- 1985
- 1986
- 1987
- 1988
- 1989
- 1990
- 1991
- 1992
- 1993

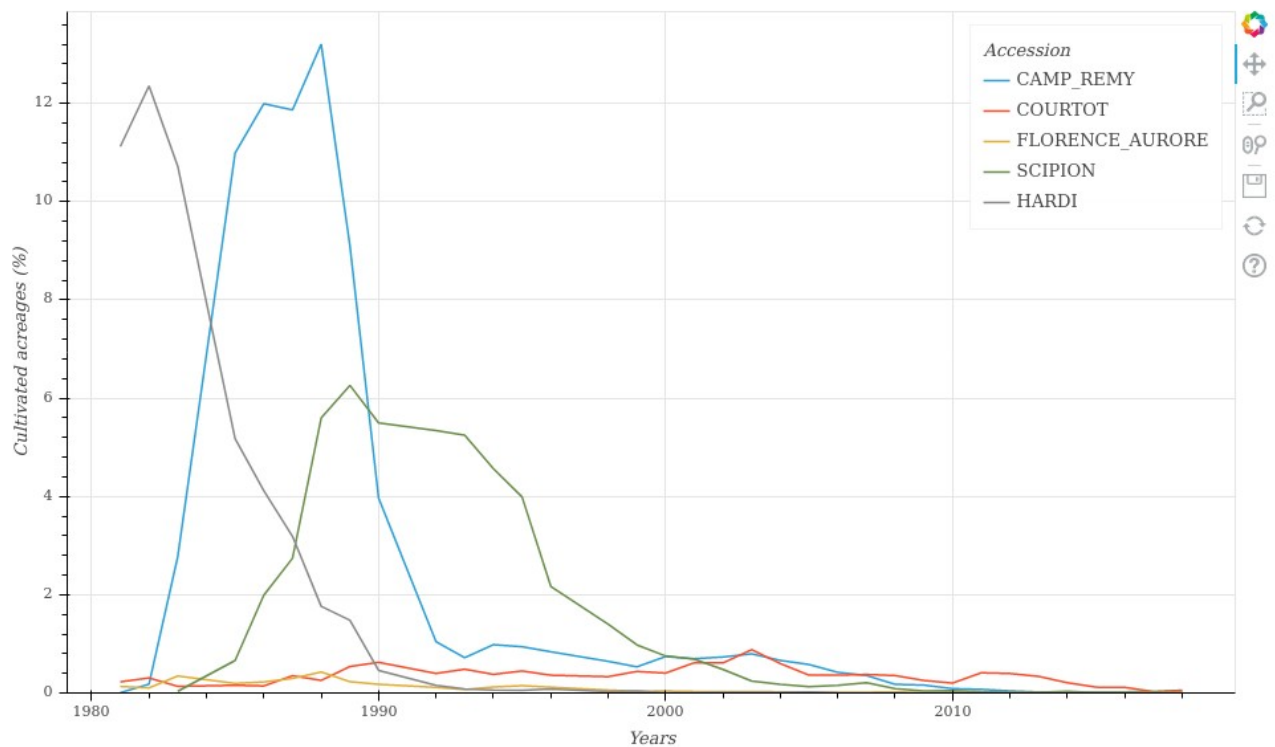
Tick all

Submit

Figure 42: Step 2 & 3 of the life cycle viewer: Choose accession(s) and years

The second step is to select the country for which the user wants to visualize data. By selecting the country, on the next step, accessions will be filtered and only accessions and years for which there is data in the database will be displayed. In the selector, accession with the most repartition data will be placed first in the list. The accession selector is an autocompletion field that allows to easily search for a specific accession name. In the years selector, it is possible to select only one or two years or a range of years. It is possible to select all the years with the “Tick all” option.

Life Cycle Viewer









Percentages of cultivated acreages vs. years in France

Figure 43: Life cycle viewer result

On the submission of the form, a graph appear, displaying the percentages of cultivated acreages versus the years in the selected country. The chosen accessions are represented by lines of different colors.

On the right side of the graph, there is some functionalities to use to manipulate the representation.

-  Pan tool: allowing to move the graph by clicking and holding the mouse
-  Box zoom tool: drawing a box on the graph with the mouse will center the graph on the selected zone
-  Wheel zoom tool: scrolling with the mouse will zoom on the graph
-  Save tool: to export an image of the graph
-  Reset tool: to reset the graph
-  Help tool: to get help on the tools (developer documentation)

By going back to the previous page in the browser, it is possible to make a new query easily.

C.4.b Variety repartition

The second menu is called variety repartition and allows to visualize varieties repartitions on a land unit for a year, that is to say, the percentage of repartition of each variety on the land unit for a specific year.

Variety Repartition Viewer

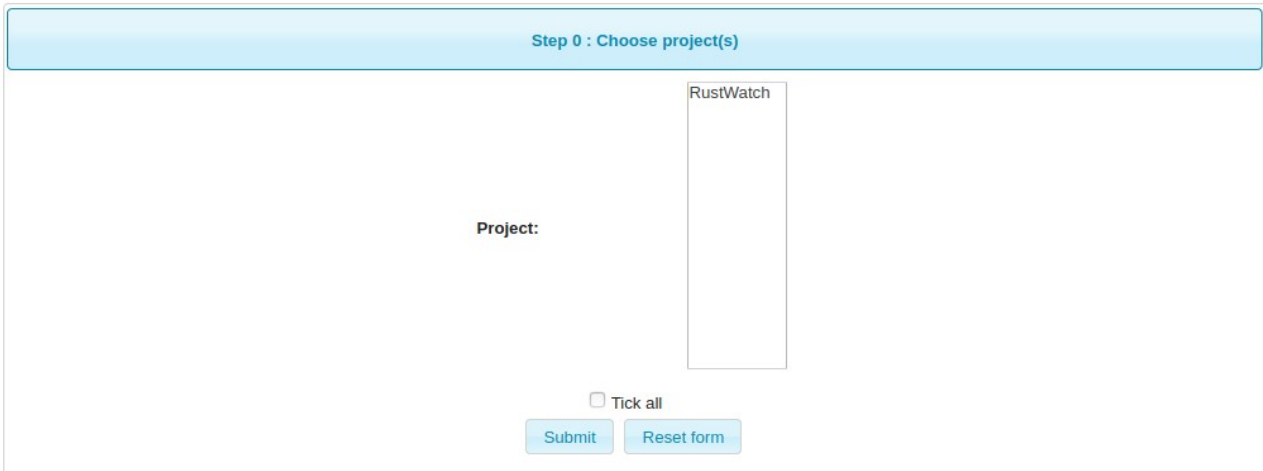


Figure 44: Step 0 of the variety repartition viewer: Choose project(s)

The first step on this menu is to select for which projects the users wants to visualize the data. On this form, the user can select only the projects to which he has access to.

Variety Repartition Viewer

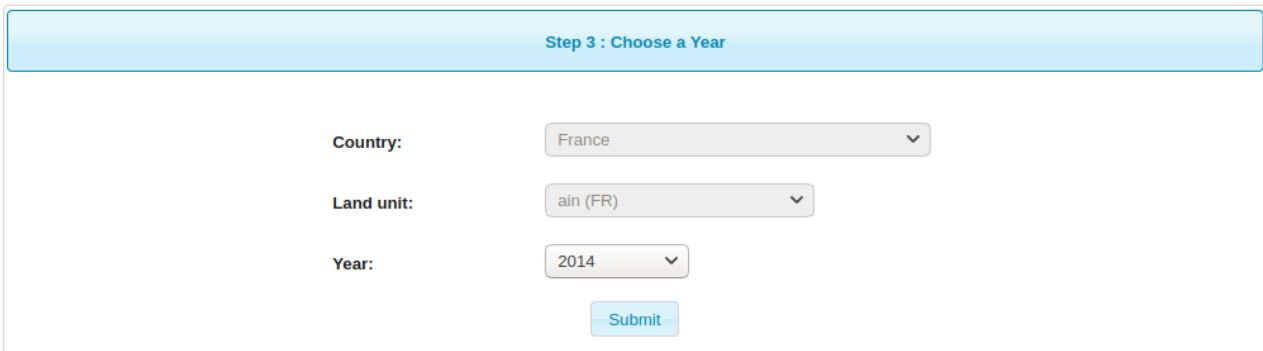


Figure 45: Step 1, 2 & 3 of the variety repartition viewer: choose country, land unit and year

The second step is to select the country for which the user wants to visualize data. On the selection of the country, the form will allow the selection of the land unit, and then the selection of the year. The possibilities are filtered to build a query that will provide a result, according to the existing data in the database.

Variety Repartition Viewer: ain (FR) in 2014

View figure

Repartition of cultivated acreages (%) by varieties: ain (FR) in 2014

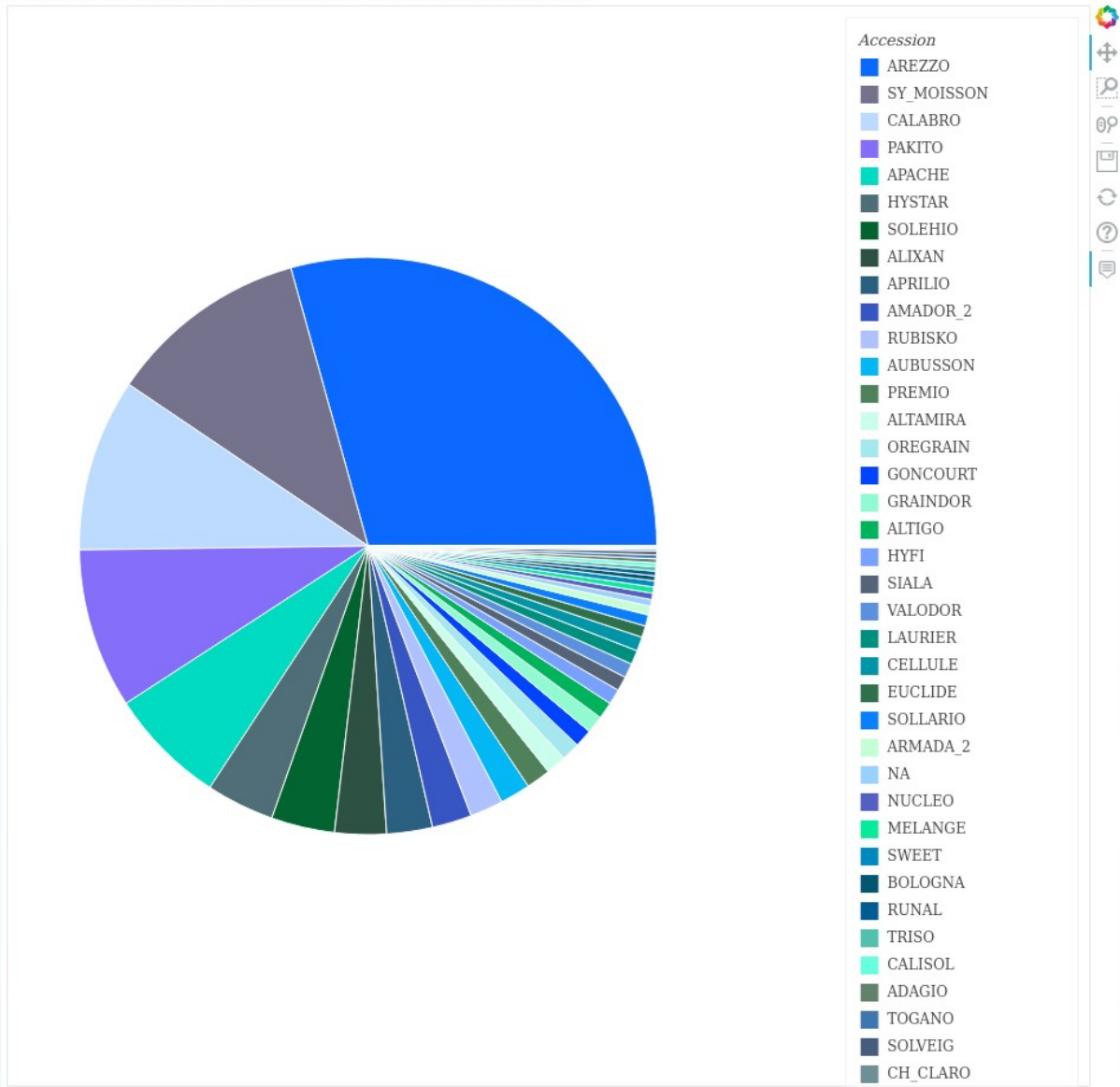









Figure 46: Variety repartition viewer result: pie chart

On the submission of the form, a pie chart appear, displaying the repartition of cultivated acreages (%) by varieties on the selected land unit and year. The varieties are represented in different colors and the percentages are displayed by passing the mouse over the fractions of the pie chart (if the hover tool is active).

On the right side of the graph, there is some functionalities to use to manipulate the representation.

-  Pan tool: allowing to move the graph by clicking and holding the mouse
-  Box zoom tool: drawing a box on the graph with the mouse will center the graph on the selected zone

-  Wheel zoom tool: scrolling with the mouse will zoom on the graph
-  Save tool: to export an image of the graph
-  Reset tool: to reset the graph
-  Help tool: to get help on the tools (developer documentation)
-  Hover tool: to display the values when the mouse is passed over the fractions of the pie chart

By going back to the previous page in the browser, it is possible to make a new query easily.

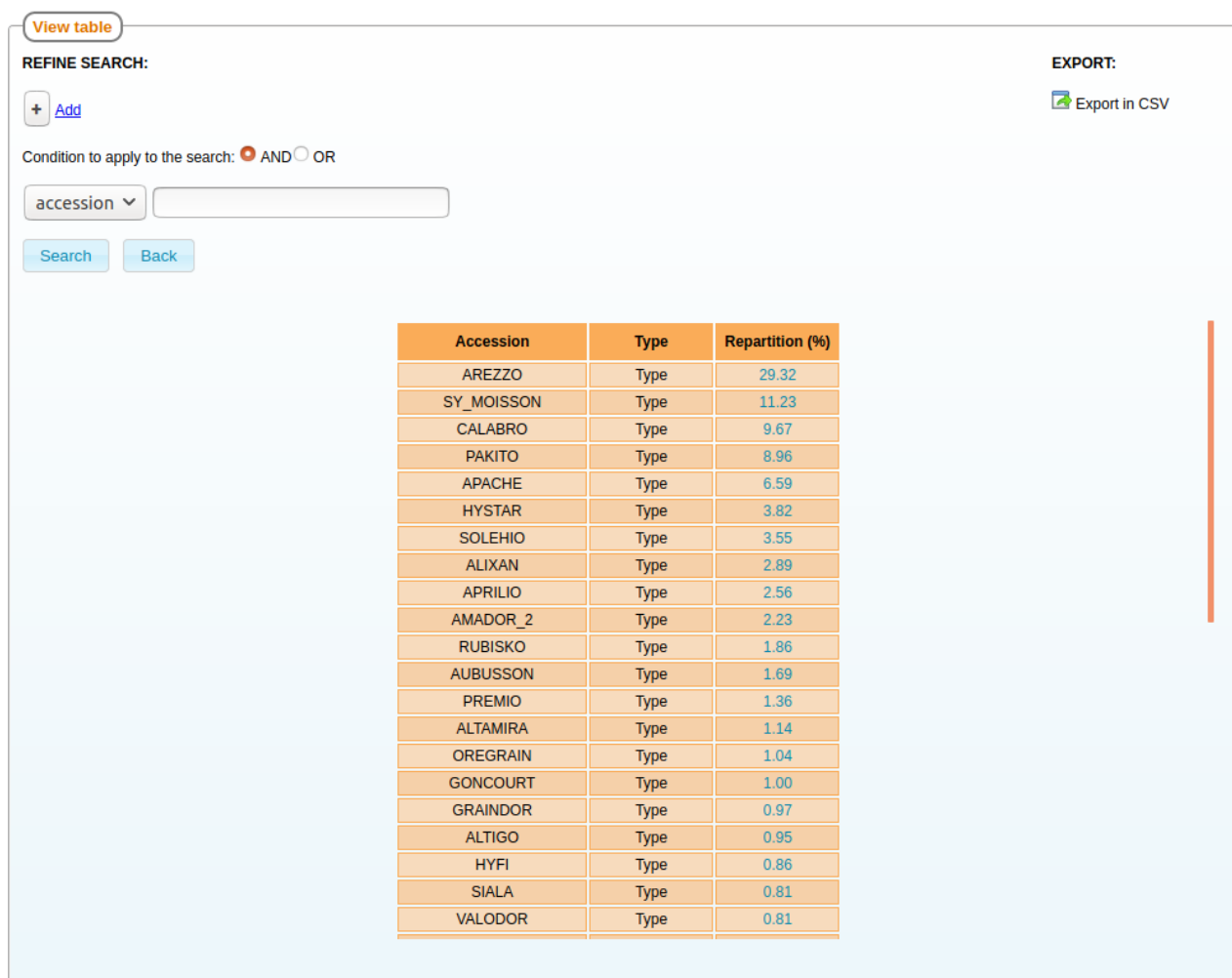



Figure 47: Variety repartition viewer result: table

If the user have an administrator status, in addition to the pie chart, a table is displayed below containing the names of the accessions present in the pie chart, as well as their types and percentages of repartition. The data is ordered in descending order for the percentages. The color code and the information displayed when the mouse is passed over the values allows to know the origin of the data (see the Administration/Landscape/Variety repartition part of the documentation).

On the top right corner of the table, there is the « Refine Search » functionality. It allows the user to search for key words in the table. To search, it is necessary to select the name of the column the

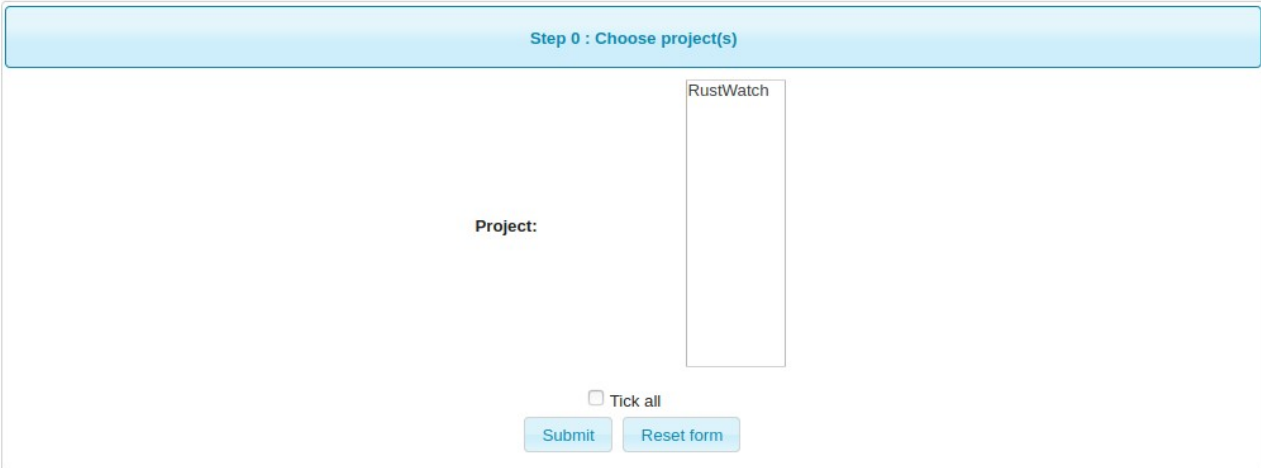
user wants to search in. Multiple searches can be done at the same time by clicking on the « add » button. That will add a new search form. When several search forms are completed, the condition of the search must be selected : AND / OR (the default value is AND).

On the right corner, there is the export function. It allows to export the table in CSV format by clicking on the  icon. When the table is filtered by the « refine search », the result of the search can also be exported.

C.4.c Repartition on map

The third menu is called variety repartition on map and enable a representation of the variety repartitions, that is to say, the percentage of repartition of each variety, for several countries, at country level, for a year on a Europe centered map.

Variety Repartition Map



Step 0 : Choose project(s)

Project:

RustWatch

Tick all

Submit Reset form

Figure 48: Step 0 of the repartition on map viewer: Choose project(s)

The first step on this menu is to select for which projects the users wants to visualize the data. On this form, the user can select only the projects to which he has access to.

Variety Repartition Map in 2015

2015 ▾

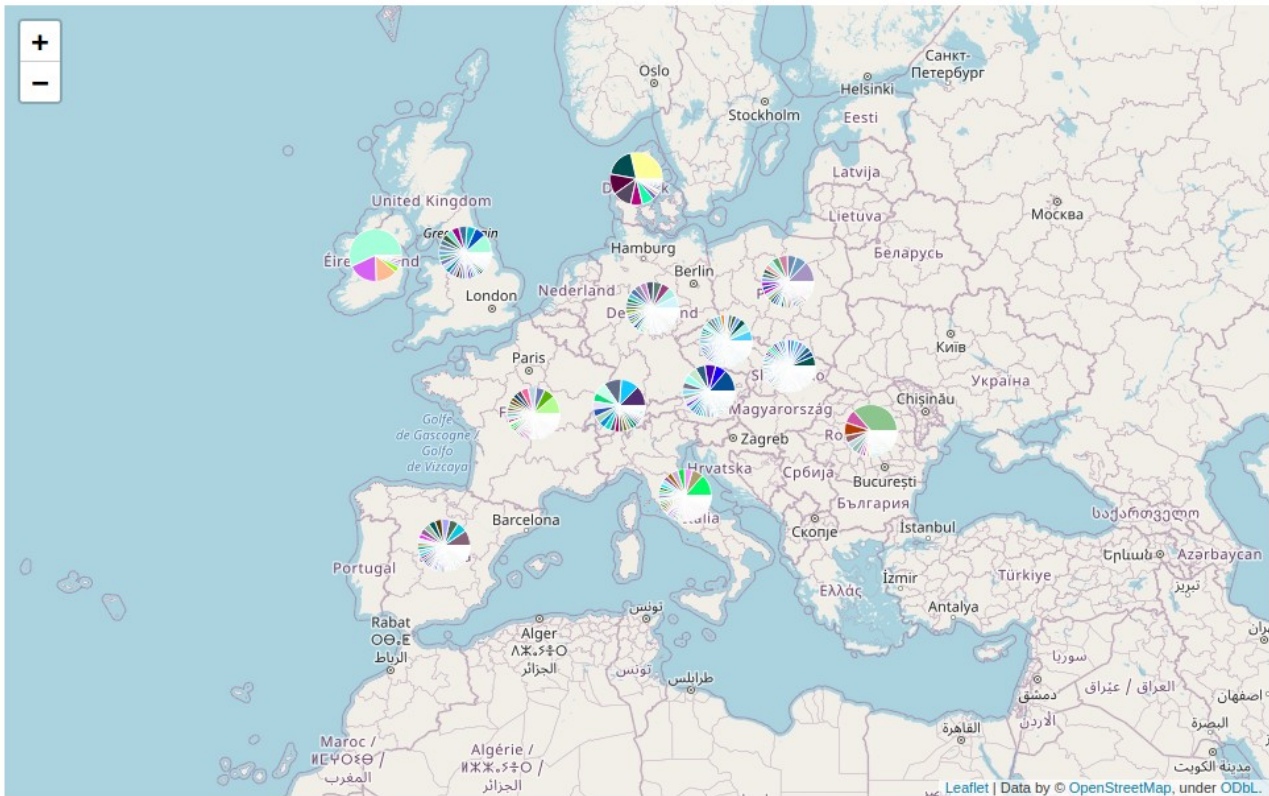


Figure 49: Repartition on map viewer result

After selecting the projects, a map will appear. On this map, for countries where data is available in the database, a pie chart will be displayed. The map is created for the most recent year for which there is data in the database. To switch years, there is a year selector on the right top corner of the map. When a new year is selected, the map will be updated to show the new data. It is possible to move the map by clicking on it and dragging.

The pie charts on the map displays the repartition of cultivated acreages (%) by varieties on the countries for the selected year. The varieties are represented in different colors, and the color code is the same for all pie charts.

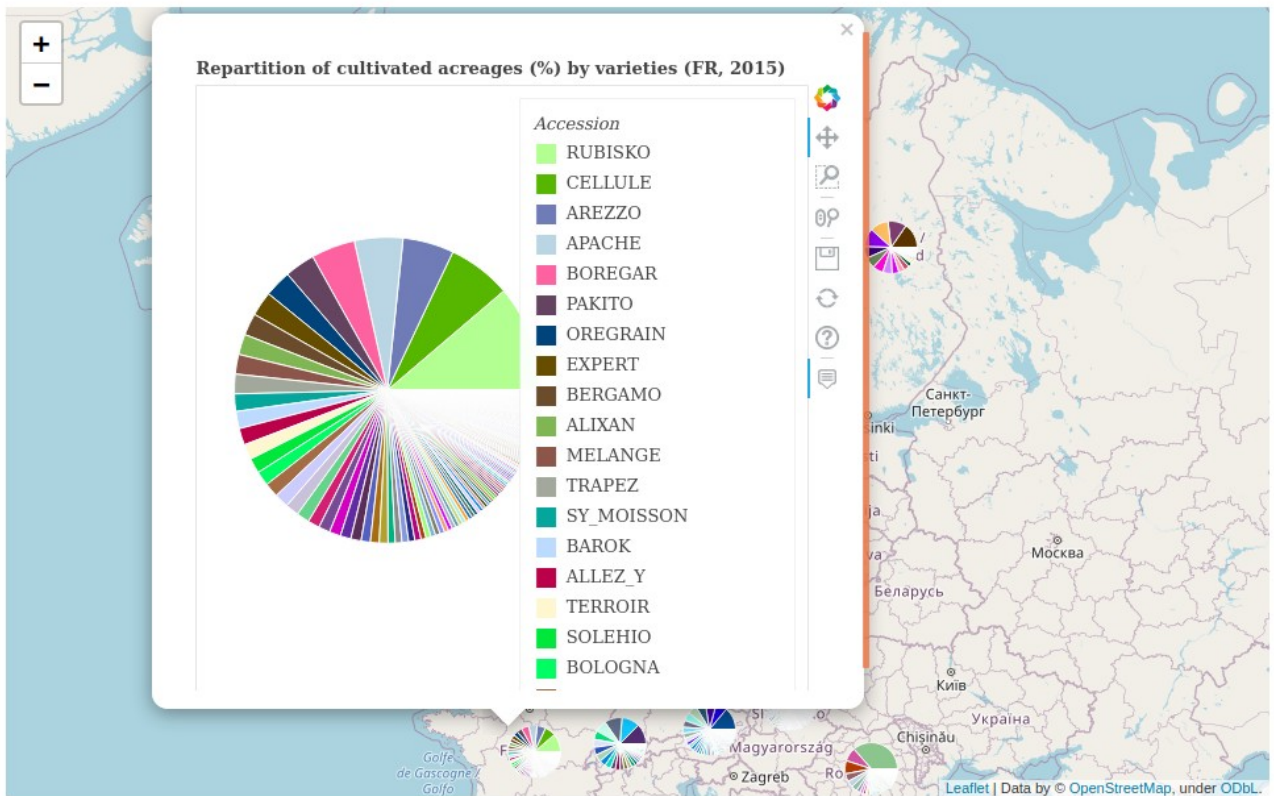









Figure 50: Repartition on map viewer result, pop up

With a click on a pie chart, a pop up will open, allowing the user to have a closer look on it. The repartition percentages are displayed by passing the mouse over the fractions of the pie chart (if the hover tool is active).

On the right side of the graph, there is some functionalities to use to manipulate the representation.

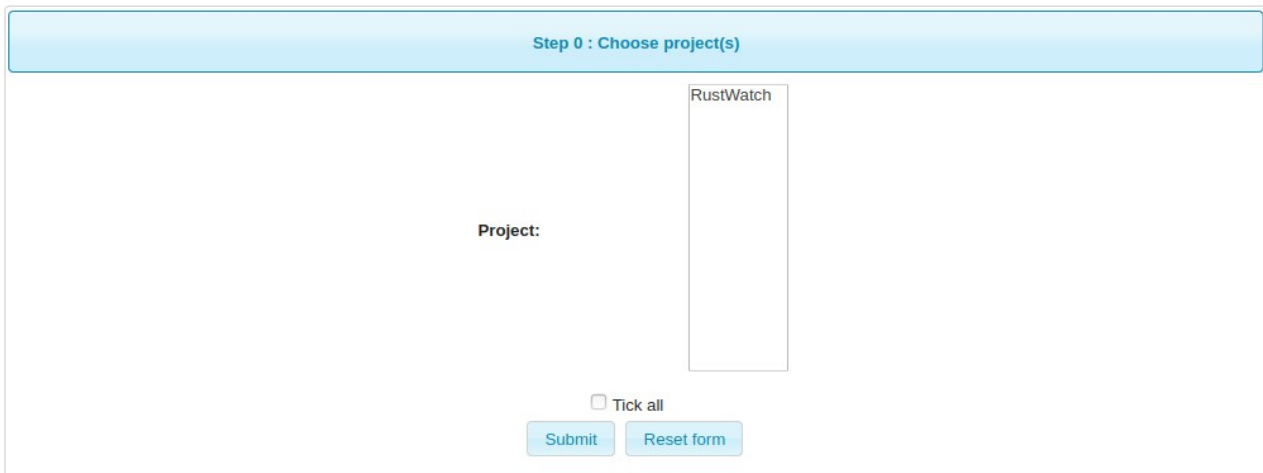
-  Pan tool: allowing to move the graph by clicking and holding the mouse
-  Box zoom tool: drawing a box on the graph with the mouse will center the graph on the selected zone
-  Wheel zoom tool: scrolling with the mouse will zoom on the graph
-  Save tool: to export an image of the graph
-  Reset tool: to reset the graph
-  Help tool: to get help on the tools (developer documentation)
-  Hover tool: to display the values when the mouse is passed over the fractions of the pie chart

A click on the cross on the top right corner will close the pop up.

C.4.d Trait deployment on map

The fourth menu is called trait deployment map. It allows to visualize catalogue data for varieties weighted by their repartition, that is to say, the percentage of repartition of varieties, for several countries, at country level, for a year on a Europe centered map.

Trait Deployment Map

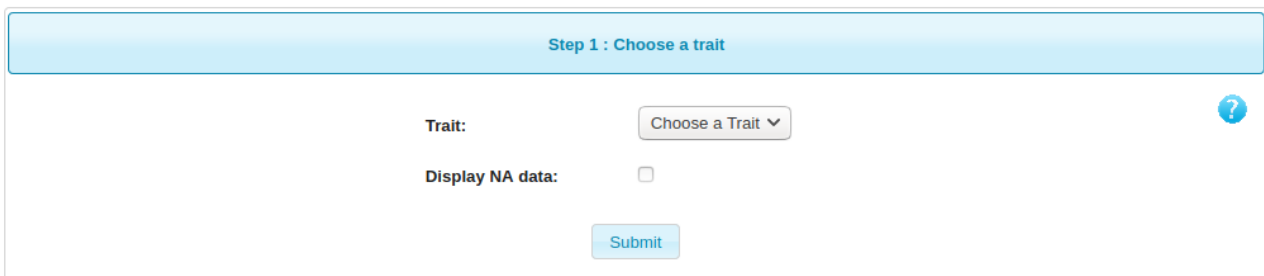


The screenshot shows a web form titled "Step 0 : Choose project(s)". It features a "Project:" label on the left and a vertical list box on the right containing the text "RustWatch". Below the list box is a checkbox labeled "Tick all". At the bottom of the form are two buttons: "Submit" and "Reset form".

Figure 51: Step 0 of the trait deployment map viewer: Choose project(s)

The first step on this menu is to select for which projects the users wants to visualize the data. On this form, the user can select only the projects to which he has access to.

Trait Deployment Map



The screenshot shows a web form titled "Step 1 : Choose a trait". It has a "Trait:" label on the left and a dropdown menu on the right with the text "Choose a Trait" and a downward arrow. Below this is a checkbox labeled "Display NA data:". At the bottom of the form is a "Submit" button. A blue question mark icon is located in the top right corner of the form area.

Figure 52: Step 1 of the trait deployment map viewer: choose a trait and if NA data must be displayed

After selecting the projects, the second step is to select the trait for which the catalogue data should be displayed, and it is possible to select if NA data should appear or not on the representation by checking the box.

On the submission of the form, a map appear. On this map, for countries where data is available in the database (catalogue data + repartition data), a pie chart will be displayed. The map is created for the most recent year for which there is data in the database. To switch years, there is a year selector on the right top corner of the map. When a new year is selected, the map will be updated to show the new data. It is possible to move the map by clicking on it and dragging.

The pie charts on the map displays catalogue data weighted by the repartition of cultivated acreages (%) by varieties on the countries for the selected year. The different values of the scale are represented by different colors on the pie charts. The color code is the same for all the pie charts.

On this representation, data are converted to a common scale to be displayed, with the help of the scale file that can be submitted in the Trait Management part of DiverCILand, on the Administration menu. If no scale file has been submitted for the trait to visualize, no data will be displayed and a message will appear on top of the map to inform the user.

If the user have an administrator status, there is a link below the table allowing to export the scale file that was used to convert the catalogue data on this representation.

Trait Deployment Map in 2015

There is no conversion to the common scale in the file for the countries: CZ, DK, FI, DE, IE, PL, RO, SK, ES. The data can't be displayed on the map.

2015 ▾

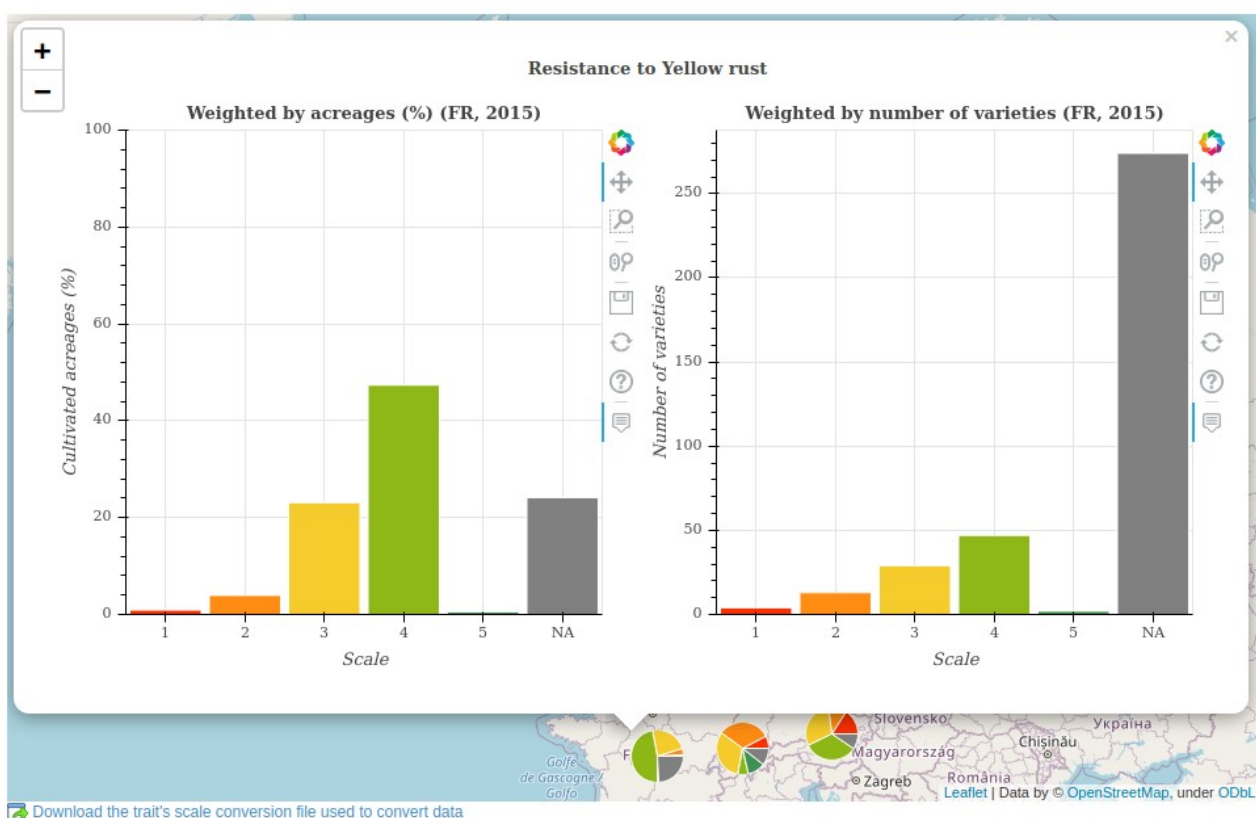









Figure 53: Trait deployment map viewer result, pop up

With a click on a pie chart, a pop up will open, containing two bar plots. The one on the left represents catalogue data weighted by acreages (%), that is to say, the same information that on the pie chart. The bar plot on the right represents catalogue data weighted by the number of varieties.

On the right side of the two bar plots, there is some functionalities to use to manipulate the representation.

-  Pan tool: allowing to move the graph by clicking and holding the mouse

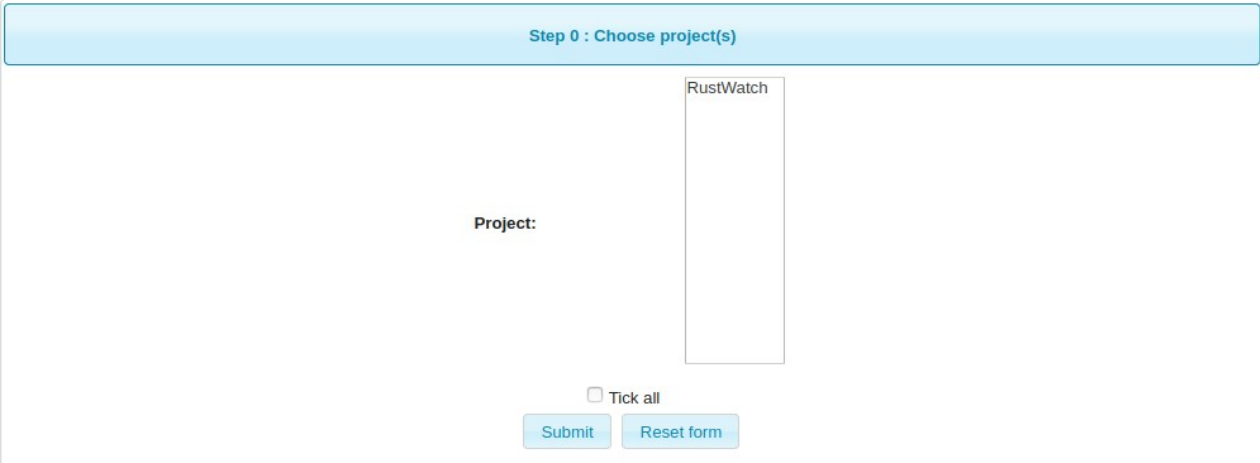
-  Box zoom tool: drawing a box on the graph with the mouse will center the graph on the selected zone
-  Wheel zoom tool: scrolling with the mouse will zoom on the graph
-  Save tool: to export an image of the graph
-  Reset tool: to reset the graph
-  Help tool: to get help on the tools (developer documentation)
-  Hover tool: to display the values when the mouse is passed over the fractions of the plot

A click on the cross on the top right corner will close the pop up.

C.5 Phenotyping

The phenotyping viewer of DiverCILand is called Catalogue data viewer. This menu allows to see the evolution of catalogue data across the years for a trait and several varieties.

Catalogue data Viewer

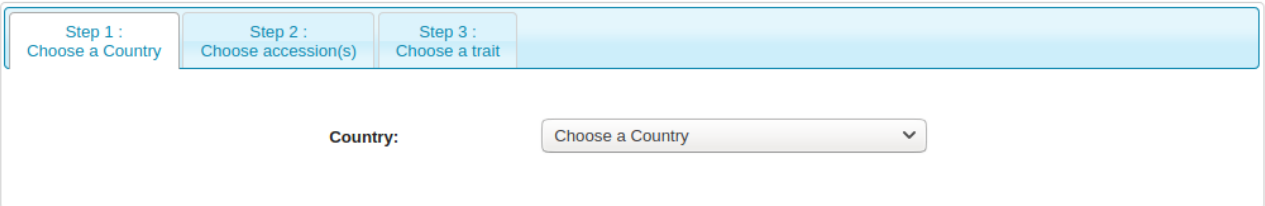


The screenshot shows the 'Step 0 : Choose project(s)' interface. It features a light blue header bar with the text 'Step 0 : Choose project(s)'. Below the header, there is a 'Project:' label on the left and a vertical list box on the right containing the text 'RustWatch'. At the bottom of the list box, there is a checkbox labeled 'Tick all'. Below the list box, there are two buttons: 'Submit' and 'Reset form'.

Figure 54: Step 0 of the catalogue data viewer: Choose project(s)

The first step on this menu is to select which projects the users wants to visualize the data. On this form, the user can select only the projects to which he has access to.

Catalogue data Viewer



The screenshot shows the 'Step 1 : Choose a Country' interface. It features a light blue header bar with three tabs: 'Step 1 : Choose a Country', 'Step 2 : Choose accession(s)', and 'Step 3 : Choose a trait'. Below the header, there is a 'Country:' label on the left and a dropdown menu on the right with the text 'Choose a Country' and a downward arrow.

Catalogue data Viewer

Step 1 : Choose a Country

Step 2 : Choose accession(s)

Step 3 : Choose a trait

Accession:

- × ABAQUE
- 08THES2162
- AALLOTAR
- ABAQUE
- ABATE
- ABDERRAMAN
- ABO
- ABOUKIR
- ACA 320

DiverCLand V1.0.0

Submit

Catalogue data Viewer

Step 1 : Choose a Country

Step 2 : Choose accession(s)

Step 3 : Choose a trait

Trait:

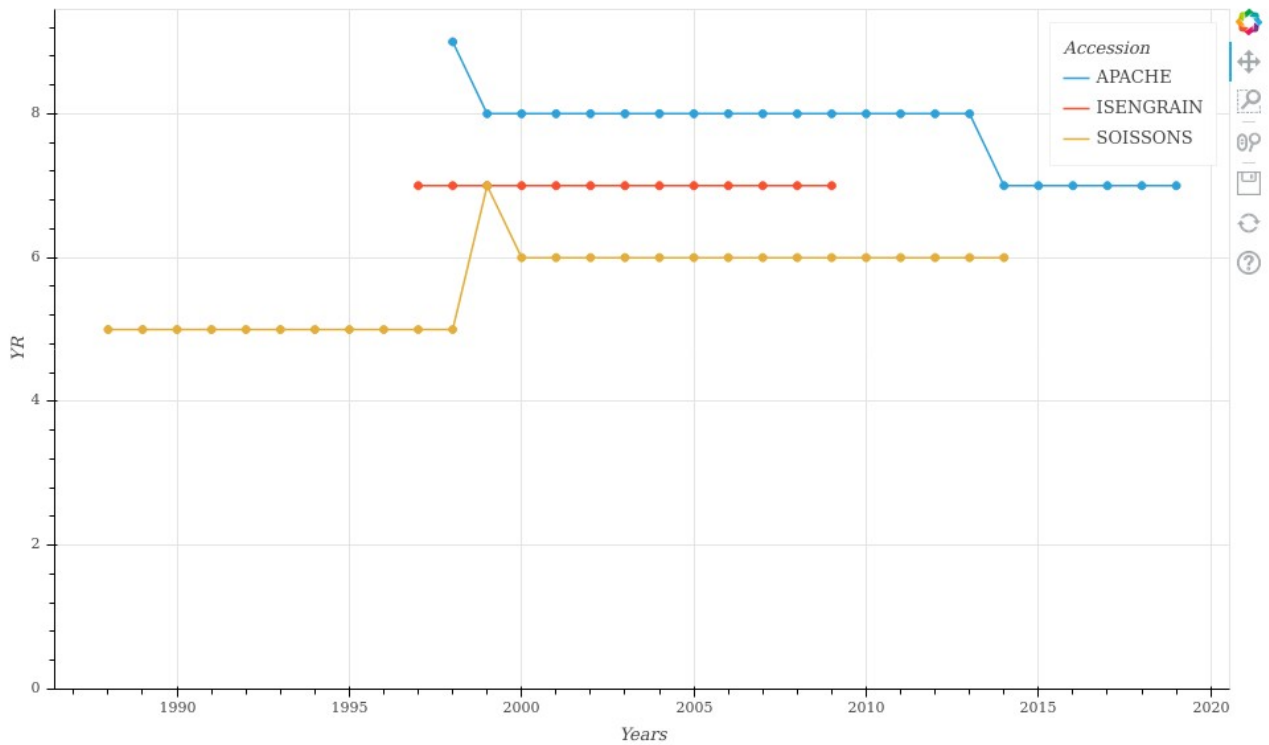
Choose a Trait ▼

Submit

Figure 55: Step 1, 2 & 3 of the catalogue data viewer: Choose a country, accession(s) and the trait

The second step is to select the country for which the user wants to visualize data. By selecting the country, on the next step, accessions will be filtered and only accessions and traits for which there is data in the database will be displayed. The accession selector is an autocomplete field that allows to easily search for a specific accession name.

Catalogue data Viewer









Scale for Yellow rust trait vs. years in France

Figure 56: Catalogue data viewer result

On the submission of the form, a graph appear, representing the evolution of the catalogue values over time for the considered accession(s) and trait. The chosen accessions are represented by lines of different colors. Each circle represents a value stored in the database.

On the right side of the graph, there is some functionalities to use to manipulate the representation.

-  Pan tool: allowing to move the graph by clicking and holding the mouse
-  Box zoom tool: drawing a box on the graph with the mouse will center the graph on the selected zone
-  Wheel zoom tool: scrolling with the mouse will zoom on the graph
-  Save tool: to export an image of the graph
-  Reset tool: to reset the graph
-  Help tool: to get help on the tools (developer documentation)

By going back to the previous page in the browser, it is possible to make a new query easily.

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