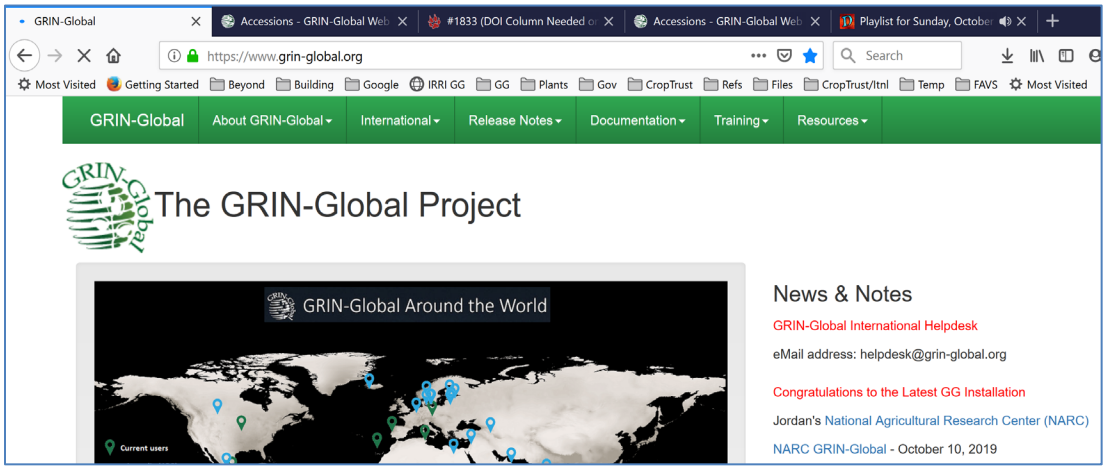
European Genebanks Workshop October, 2022

Participant Guide

Revision Date
October, 2022

Extensive GRIN-Global documentation is available online at https://www.grin-global.org/ Recommended: bookmark the **User Documentation** webpage: https://www.grin-global.org/userdocs.htm. These documents are revised on an ongoing basis.

This participant guide and other presentation materials are stored at the URL https://www.rrginc.com/gg_training/index.php Consider downloading this document for the clickable links shown in this document.



Comments/Suggestions
Please contact Marty Reisinger at mar@rrginc.com or either marty.reisinger@usda.gov with any suggestions or questions related to this document.

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Objectives

Participants will learn…

1. The basics of the GRIN-Global Environment
2. Methods for storing and retrieving data
3. GRIN-Global's features – introducing its capabilities for managing genebank data: especially accessions, inventory, germplasm requests, & observations

GRIN-Global Environment: Curator Tool (CT) and Search Tool

Introduction

GRIN-Global uses a client-server configuration. The main GG database is stored on a server. Each genebank staff person will have two applications installed on their PC. The GG Curator Tool (CT) is the primary application that GG staff use to manage and edit their genebank's data. When the Curator Tool is installed, the Search Tool is automatically installed also. These two tools work independently but are closely related.

Genebank staff use *some* of the GG components:

- Curator Tool
- Search Tool
- Public Website

GG Administrators also use:

- Admin Tool
- Updater

- Curator Tool –
  - create new and edit existing data
  - maintains ongoing lists for the staff person for managing the data
  - can save search tool queries for ongoing use

- Search Tool –
  - uses criteria to find existing data in the database
  - users can copy the found data to the CT

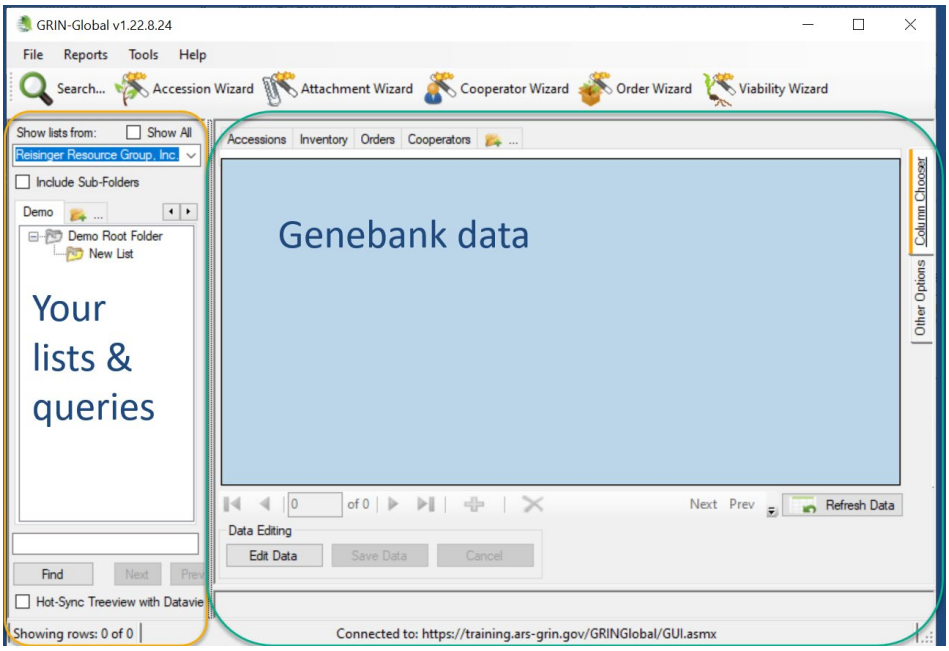
Installation directions and files needed for installation are online at http://grin-global.org/download_ct.html.

Reference: https://www.grin-global.org/docs/gg_getting_started.docx

Server connection instructions: https://www.grin-global.org/docs/gg_connecting_to_servers.pdf

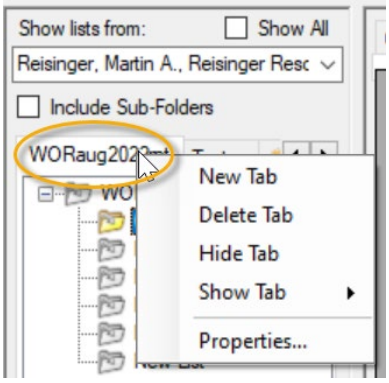
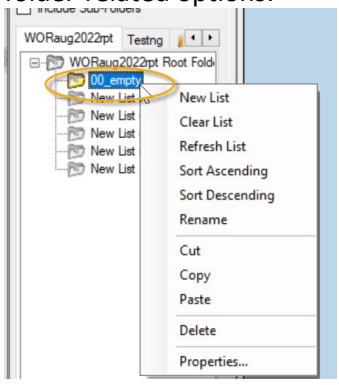
Curator Tool Interface

- List Panel (left panel)
  - create tabs and lists (folders) as needed
  - user-customizable and shareable (use the Show Lists dropdown)
  - lists can be static (with specific items) or dynamic (queries)
- Data grid (right panel)
  - lists data in the database
  - dataviews determine what data is displayed (depend on the lists)
  - in Edit mode, when the user has the proper permissions, the data can be updated



Right click!

When in doubt, right-click! In the Curator Tool, right-clicking often displays a relevant menu that provides available options at that moment in time.

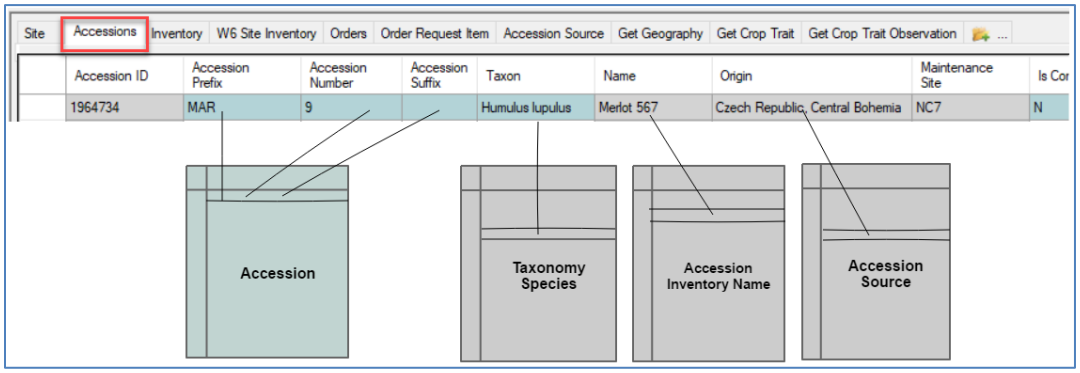
When you right-click a tab, the menu displays tab options:	Right-click a folder; the menu displays folder-related options:
	

Dataview Overview

A dataview serves as a "camera's lens" to the data, focusing on *some* of the database fields.

What is a dataview? A dataview is a SQL query that displays data matching specified criteria. (A GG IT manager can create / customize dataviews to meet a genebank's needs, but GG comes bundled with *many!*)

Example: The main **Accessions** dataview combines data from multiple tables:

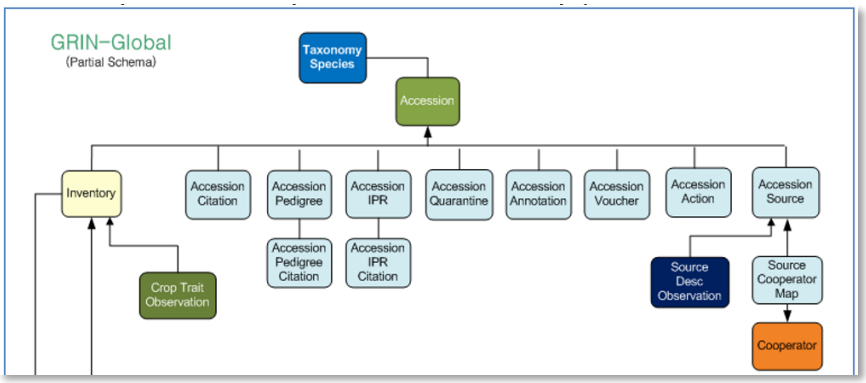


- the CT Guide has an extensive description on dataviews; see https://www.grin-global.org/docs/gg_curator_tool_user_guide.docx
- video: https://www.grin-global.org/videos/dataview_basics.mp4
- the online dictionary has a worksheet with the tab "Dataview List" which can be referenced to list any dataview: http://grin-global.org/files/gg_dictionary.xlsx

Accessions and Passport Data

In GG, an accession's passport data is stored in multiple tables.

- an accession-level record should be created immediately when new germplasm material arrives in the genebank – only a few data points are initially necessary
- the accession's passport data indicates where the germplasm material came from, who provided it, what form it was when received, and names it may be referred to, etc.
- the accession "identifier" (number) relates the data across the tables



- the Accession Wizard may be used to switch easily across the accession dataviews

References:
Main reference: https://www.grin-global.org/docs/gg_accessions_and_passport_data.docx

Refer to the online dictionary for field descriptions. Also, refer to other documents relevant to accessions:

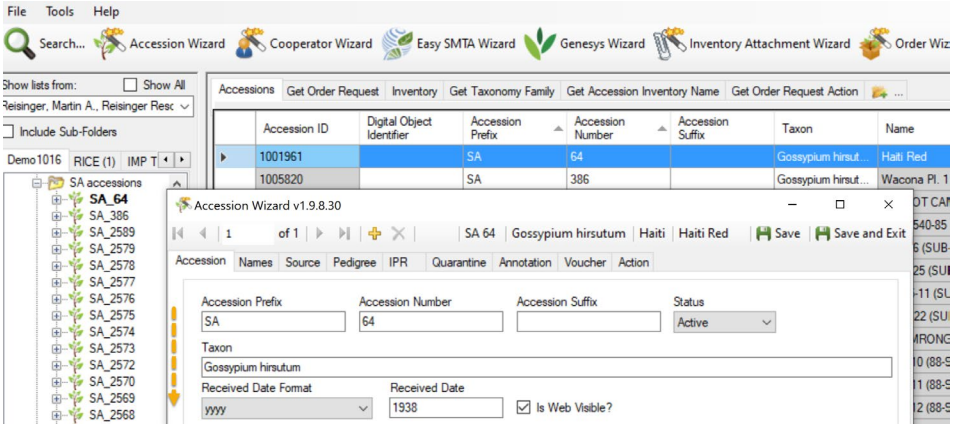
- Multi Crop Passport Descriptors (MCPD)
  https://www.grin-global.org/docs/gg_multi_crop_passport_descriptors_MCPD.docx
- Digital Object Identifiers
  https://www.grin-global.org/docs/gg_doi.docx

Accessions – Creating / Editing Records

Three main ways to add / edit accessions:

- Manually, one at a time – in the Accession dataview (main accession data)
- Manually, one at a time – via the Accession Wizard (where the subordinate accession data can also be added) – ***Recommended***
- Many at a time – by dragging data from a spreadsheet into the Accession dataview

Accession Wizard

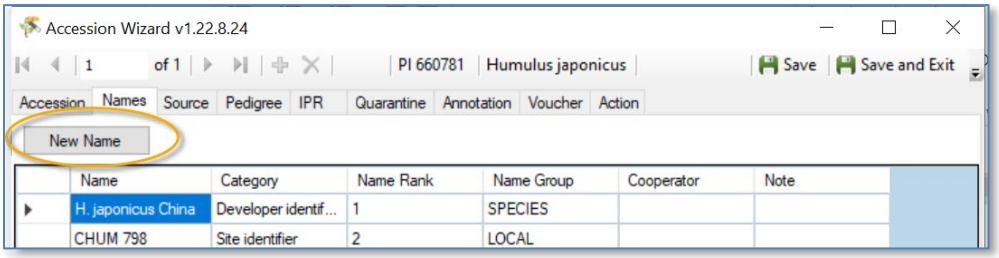


Reference

Refer to the **Accession Names** section in the https://www.grin-global.org/docs/gg_accessions_and_passport_data.docx guide for a detailed explanation of names, including the topics of "top name" and name ranking.

Accession Wizard

The subordinate dataviews have their respective tabs. On each of these windows, there is a **New *dataview*** button. When clicked, the Curator Tool displays a new row on the dataview grid for inputting data. Shown here is the **New Name** button on the wizard's **Names** form with two existing name records for the accession. Recommended: **Save** before switching to another tab.



"*Drag & Drop*" Records to and from Excel

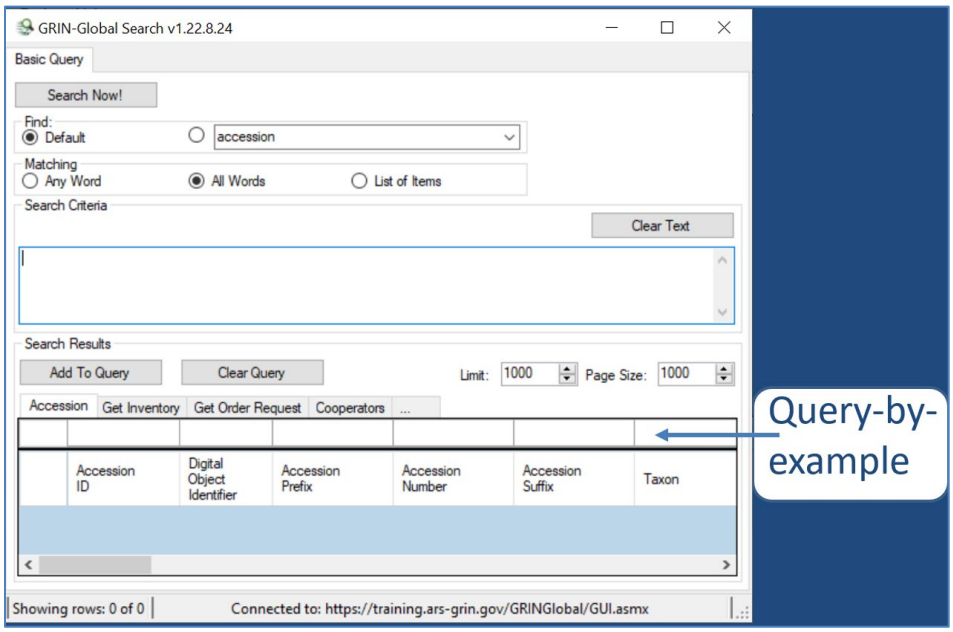
Key Points:

When copying data from a spreadsheet into the CT, remember:

- the *spelling* of the *column headings* in the Excel sheet and in the CT dataview *must match*
- the column order does not matter // not all columns are needed
- *always include the left ID column*, the primary key field
  - empty _ID fields *add new* records
  - matching _ID fields *update existing* records

Searching

Search Tool Interface



Reference

Refer to the online Searching document at https://www.grin-global.org/docs/gg_searches.docx Refer also to: http://grin-global.org/docs/gg_dynamic_folders.docx

Finding Existing Data: Query-By-Example (QBE) Searches

The following table is a subset of a table in the online guide, illustrating some types of QBE searches:

Wildcard / Operator	Examples / Notes
% (percent symbol) * (asterisk) _ (underscore)	% and * -- any character, any number of characters; _ -- any single character Example: **Prunus%var** will locate any Prunus with "var" included; **%var%** will locate any accessions with the text "var" as part of its taxon

Wildcard / Operator	Examples / Notes
IS NULL / IS NOT NULL	NULL values represent missing unknown data. NULL and 0 are not equivalent.
LIKE	Search for a specified pattern. Example: **LIKE 'CAPSICUM%'** In this case the QBE is saying find any text that begins with "Capsicum."
Date Fields *Microsoft SQL Server* a date is stored in the **yyyy-mm-dd *time*...** format	Searching for dates can be tricky because the date field includes the time of day as well. The following are valid searches: **@accession.created_date LIKE '2015%'** **@accession.created_date LIKE '2015-09-%'** **@accession.created_date LIKE '2015-09-05%'** With date fields, end the search string with a wildcard (%), because the date fields also store time in the field. (Other useful date formats: **MM/DD/YYYY** or **MM/DD/YY** or **DD-Mon-YYYY** or **DD-Mon-YY** are supported, but *do not accept* wildcards. Example: **@order_request.ordered_date > '12/31/2017'**)
WHERE	SQL WHERE clauses work in the Search Tool. **@taxonomy_genus.genus_name LIKE 'Glycine%'** equals **WHERE taxonomy_genus.genus_name LIKE 'Glycine%'**

Query Examples

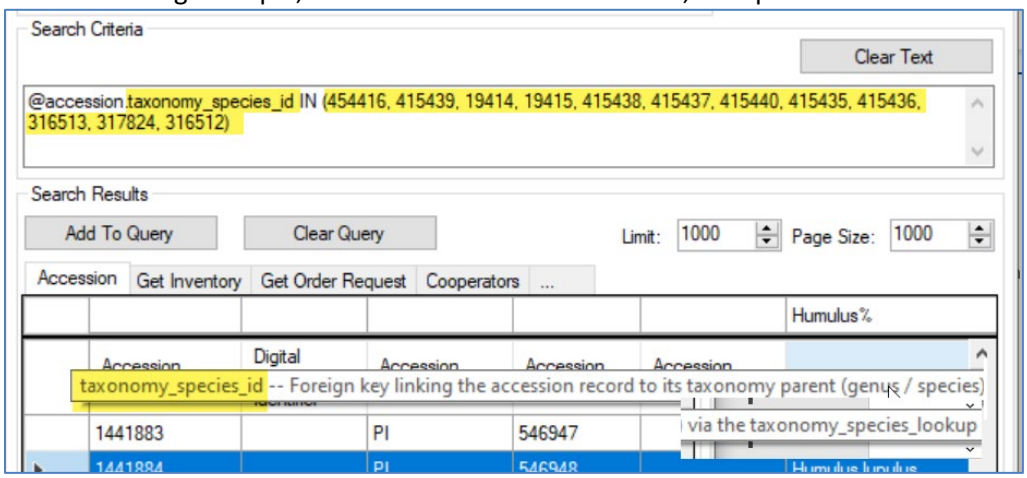
- @taxonomy_genus.genus_name = 'oryza'
- @taxonomy_genus.genus_name LIKE 'ory%'

- @inventory_viability.percent_viable BETWEEN 40 AND 75

- @inventory_maint_policy.maintenance_name LIKE 'MAR%' AND
  @inventory.availability_status_code = 'LOW' AND
  @inventory.form_code_type = 'SD'

- @inventory.quantity_on_hand < @inventory.distribution_critical_quantity
  AND @inventory.form_type_code <> '**'

In the following example, rather than the "Humulus" text, the species IDs fill in as the criteria:

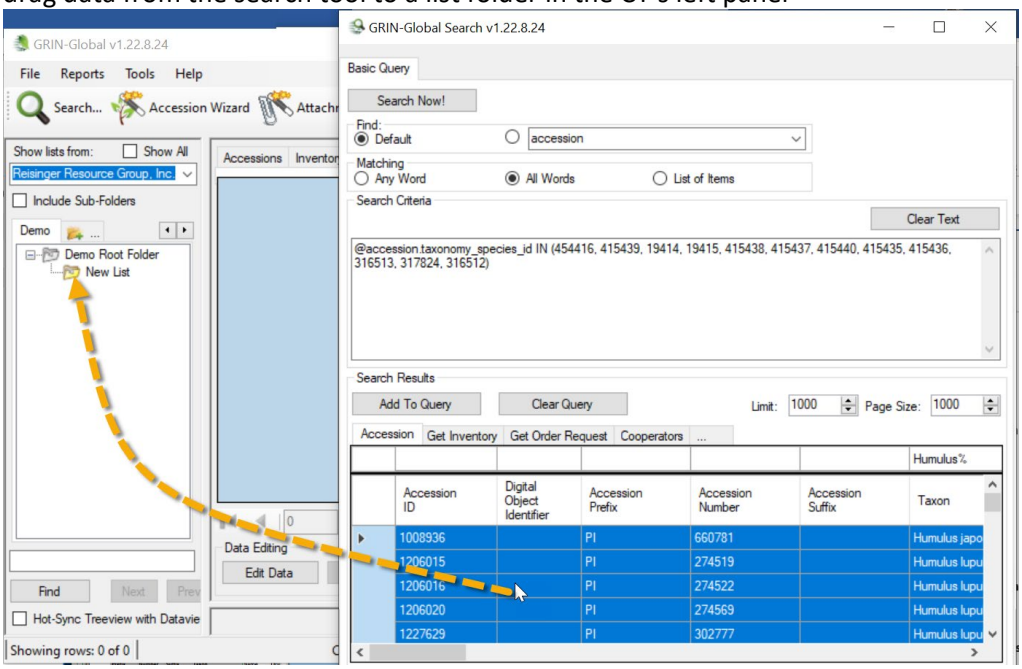


Drag and Drop from the ST to the CT

- data in the lower grid found in the Search Tool can be dragged into the Curator Tool for further review and possibly edits – creates a static list
- the query's criteria in the ST can be dragged to an empty CT folder – creates a dynamic query

Reference: https://www.grin-global.org/videos/lists.mp4

- drag data from the search tool to a list folder in the CT's left panel



Inventory

Reference

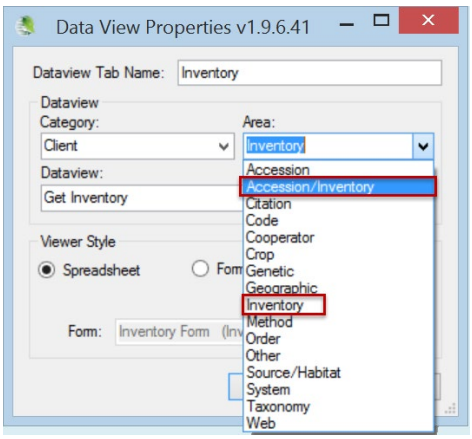
A complete guide to GG Inventory is online at https://www.grin-global.org/docs/gg_inventory.docx
Other documents are online at https://www.grin-global.org/userdocs.htm on specific inventory topics such as viability, seasonal availability, etc.

Introduction

In GRIN-Global, the physical germplasm for each accession is considered the "inventory." Typically, an accession will have multiple lots – different generations, form types (plants, seeds…), germplasm stored at different locations or for backup purposes, etc.

Each physical lot should have its own respective inventory record in GG. The physical germplasm is associated with its related accession via the accession's identifier. Other data such as the specific inventory data – quantity on hand, its storage location, date of harvest, the parental lot, and other information – this information is inputted into GRIN-Global via the main I**nventory** dataview.

The CT has two areas for inventory related dataviews. Why two areas? Because some inventory dataviews pertain strictly to inventory records, such as **Inventory Action**, whereas others can apply to either inventory *or* accessions. An example of the latter is "**Names**," which can be assigned to an accession in general or to a specific inventory lot.



GRIN-Global System Inventory Records
In GG, when creating a new accession record, a default inventory record, referred to as the System Inventory record, is also created. These records cannot be edited. They do not represent physical inventory.

Inventory Maintenance Policy

- Think of the Inventory Maintenance Policy as a template – it fills in *some* fields in a *new inventory record*
- If you change the policy later, the CT does not adjust any data in *existing inventory records, except…*
- …the owner of the Inventory Maintenance Policy is always the owner of the inventory record

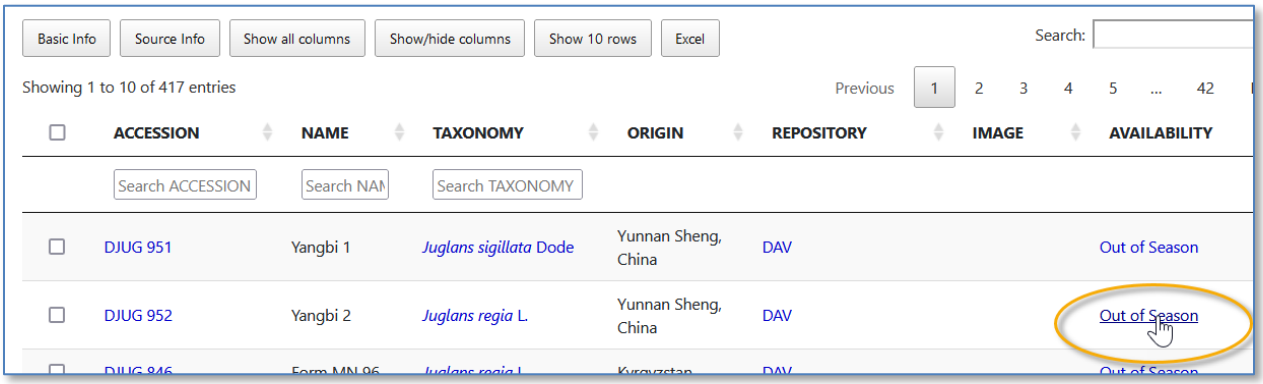
Public Website Visibility and Availability

The Accession **Is Web Visible?** field controls whether an accession is displayed in the GG Public Website. When visible, GG also can indicate if the accession/inventory is "available" for germplasm requests. In older GG versions, it was only possible to have one inventory record per accession to be available at any point in time. Two "flag" fields, **is_default?** and **is_available?** had to be set to "Y." If either field is set to "N," the accession was listed on the Public Website as "*Not Available*."

Table / Field Name	Field type	Impact / Effect
Acc. / Is Web Visible?	Y / N	Public Website (PW) will display (or not), the accession on the Public Website
Inv. / Is Default?	Y / N	Would be better titled as "**Is Distributable?**" This flag field can be used to stop distributing for requests, even temporarily. For the inventory to be distributed, this field must be "Y"
Inv. / Is Available?	Y / N	For the inventory to be distributed, this field must be "Y"
Acc. / Status	Coded (Active, Inactive, Backup…)	If the **Status Code** is neither **ACTIVE** or **INACTIVE**, the accession will not be listed in any search results. INACTIVE usually indicates this is a historic record – data exists, but no physical germplasm
Inv. / Availability Status	Coded (Low, Available, Not Available, Dead…)	the value *does not determine* the availability on the PW. Can be confusing, because some genebanks use "Available" and "Not Available" as possible values. Serves more as documentation to the internal genebank staff.

Significant Changes in GG Versions with respect to requesting germplasm

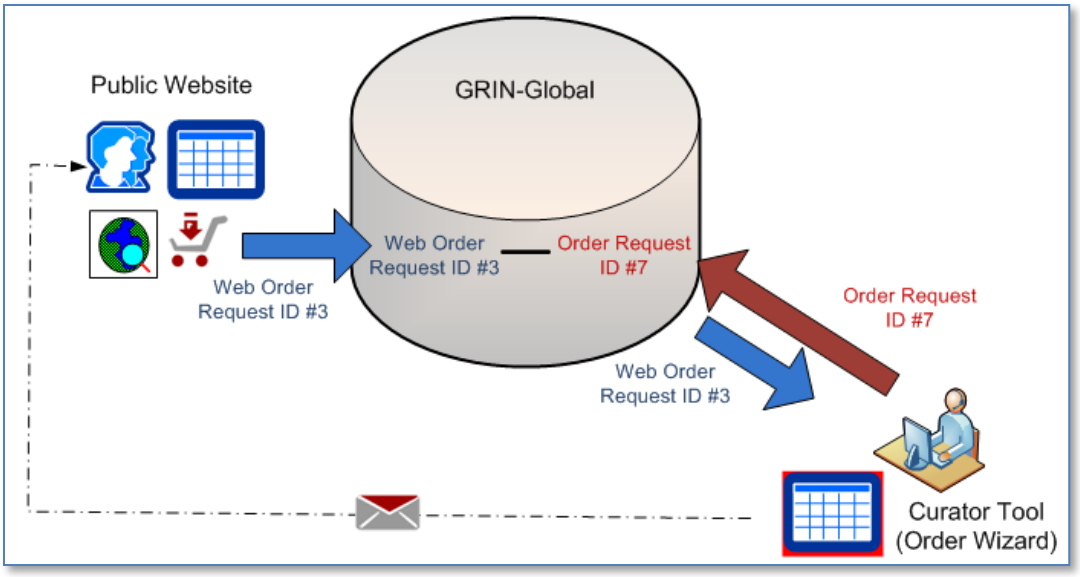
Review the *Multiple Inventories Available and Seasonally Available* section for details on more recent GG versions. It is now possible to allow the requestor to select from multiple inventory lots and GG now includes a seasonally available feature which is particularly helpful to genebanks that distribute cuttings or other living plant material besides seeds.



Processing Germplasm Requests (Orders)

A complete guide to GG Order Process is online:
https://www.grin-global.org/docs/gg_order_processing.docx

A video on processing requests is at online: https://www.grin-global.org/videos/orderwiz2.mp4



Introduction

Usually, germplasm requestors submit their *web* orders via the GG Public Website. Some genebanks may accept phone or email requests and then have an internal staff person create the request.

Using the CT Order Wizard, genebank personnel review incoming *web* order requests (WORs) and convert the *web* order requests into *standard* orders. Although the two order record types are inter-related, the two record IDs (and the records) are distinct and stored in two different tables.

Also, web requestors initially are not in the GG Cooperator table. When processed in the Order Wizard, the web requestor's data may generate two cooperator records – one for the person's primary address, and one for the shipping address that was specified in the WOR. (The cooperator table may have multiple records for the same person.)

Order Action (Workflow) Example

GG has three action tables – accession actions, inventory actions, order request actions. The Order Wizard generates some order action records automatically at certain junctions in the process, but staff can also create order request actions to assist with the management and tracking of the requests.

Accessions | Get Accession Action | Inventory | W6 Site Inventory | Orders | Order Request Item | **Get Order Request Action** | Accession Source | Get Geography | Get Crop Trait | Get Cr

Order Request Action ID	Order Request	Action Name	Started Date	Action Information	Completed Date	Action Cost	Cooperator	Note
569840	302985 - Mcmil...	New Order	04/13/2018	Send brochure.	04/13/2018		Estrada, St...	New Order created from Web Order by
569866	302985 - Mcmil...	Export requirements requested	04/13/2018	Norway Amaranthus	04/13/2018		Estrada, St...	
570056	302985 - Mcmil...	Curator alerted about order	04/16/2018	NRR?	4/16/2018 12:00...		Brenner, D...	
570200	302985 - Mcmil...	Curator cleared an order	04/16/2018	proceed	4/16/2018 12:00...		Brenner, D...	
570231	302985 - Mcmil...	Order pending	04/16/2018	Labels printed.	04/16/2018	0.05000	Estrada, St...	Order Request Item status_code changed by
570345	302985 - Mcmil...	Order filled ready to ship	04/17/2018	5: 4 oz.	4/17/2018 12:00...		Wenke, H...	
570350	302985 - Mcmil...	Hold order pending action	04/17/2018	APHIS batch	4/17/2018 12:00...		Estrada, St...	The NC7 portion of your order is being prepared for shipment to U.S. quarantine facilities (APHIS). Please watch your email inbox for further updates from
570499	302985 - Mcmil...	Order sent to APHIS	04/17/2018	Shipped with 302984,302985	04/17/2018	0.00000	Estrada, St...	Order Request Item status_code changed by
577277	302985 - Mcmil...	Order shipped	05/31/2018		05/31/2018			USPS LZ982662776US
577278	302985 - Mcmil...	Completed order	05/31/2018		05/31/2018			
579756	302985 - Mcmil...	Order was received by recipient	06/14/2018	safe and sound	6/22/2018 12:00...		Estrada, St...	

Cooperators

Web Cooperator Records

A user on the GRIN-Global public website has an opportunity to self-register – during this registration process the user's contact information is stored in a *web* cooperator record. This web cooperator record is not the same thing as the GG cooperator record. (It will get converted into a cooperator record if the user submits an order.)

A web user can indicate multiple shipping addresses and indicate which is the default address. These shipping addresses are stored in their own table which directly relates to the web cooperator table.

Standard Cooperator Records

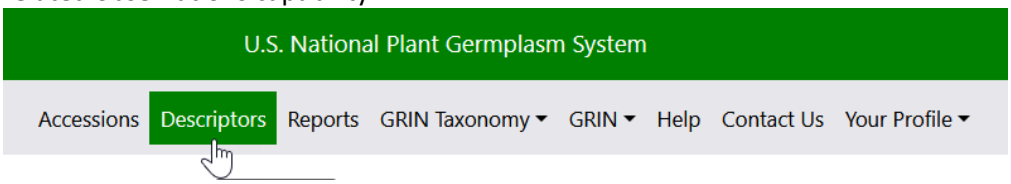
Cooperator records contain data on individuals and organizations involved with germplasm activities (donors, collectors, requestors, etc.) Besides storing active address and organization data, cooperator records can be used to store historic data containing the previous addresses of a person or institution.

Cooperators can be individuals or organizations. Organization cooperator records omit and surname or first name data.

When a cooperator has multiple records, perhaps a few active and others that are inactive, the records can be linked together. The document http://grin-global.org/docs/gg_cooperators.docx explains the detailed steps for doing this; the document http://grin-global.org/docs/gg_order_and_cooperator_wizard_v1.9.9.4.docx explains how to use the cooperator wizard (as well as the order wizard).

Observations

Multiple documents and videos are online to explain GRIN-Global's Crop Traits (Descriptors) and GG's related observations capability.



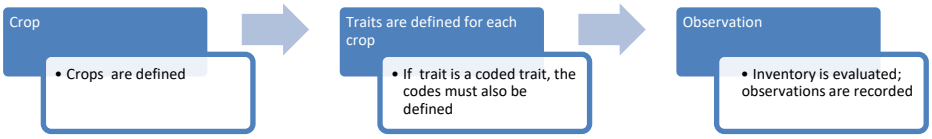
A very brief overview: http://grin-global.org/docs/HOW_DO_I_ADD_CROP_TRAITS.pdf

The guide http://grin-global.org/docs/gg_observations_and_descriptors.docx explains in more detail the relationship among the family of Crop dataviews.

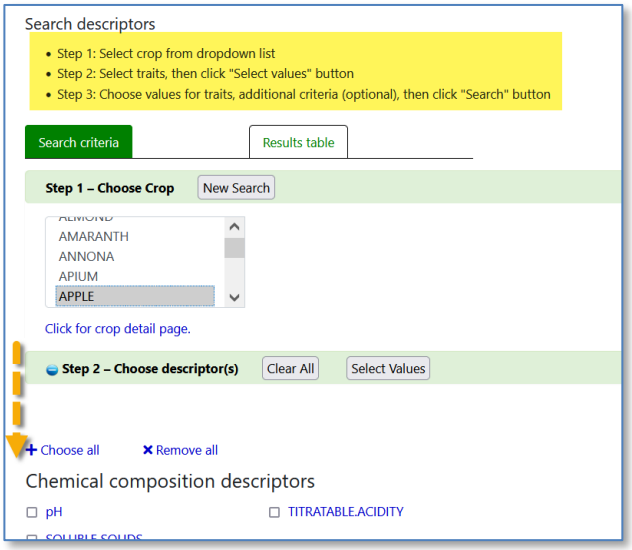
Also online is an exercise you can complete if you have the CT installed:
http://grin-global.org/docs/elderberry_crop_added.docx

The Crop Group of Dataviews

Before a single observation for an accession can be recorded, the genebank staff must define the crops, the traits, and any codes that may be used with specific traits.



Genebank staff typically load observation data by bulk adding data from spreadsheets. After observations have been loaded, the PW can be searched for observations. On the Public Website, the menu's **Descriptors** option is used to search for accessions by Crop, and then by trait criteria:



Attachments (image and other files)

References: http://grin-global.org/docs/gg_attachment_wizard.docx (prior to release 1.10.21.4)

http://grin-global.org/docs/gg_attachment_wizard.docx (release 1.10.21.4 and later)

The current wizard (release 1.21.10.4 and above) can now attach files to eight GG attach tables:

- Inventory
- Crop
- Crop Trait
- Crop Trait Code
- Method
- Accession Inventory Group
- Order Request
- Taxonomy Family / Taxonomy Genus / Taxonomy Species

The wizard can also be used to review any existing files included in these attachment records.

Attaching Files in the Curator Tool

Three basic methods exist for attaching files:

1. Drag filenames directly from Windows Explorer to an item in a CT list
2. Drag files into the Attachment Wizard (from Windows Explorer to an item in wizard)
3. Use the Batch Files method in the Attachment Wizard (this method opens a Windows Explorer window in which you can then select the containing folders or the files directly)

The first method is the simplest. The third method listed above is generally used when you have many files to be attached at one time.

Steps when using the Wizard (Summary)

1. in the CT's left list panel, start with a folder (list) of items pointing to one of the valid record types that can have attachments
2. in the right panel (the datagrid area), have the corresponding dataview active (Crop dataview if attaching to crops, etc.) and select the records with which you intend to attach files
3. invoke the **Attachment Wizard**
4. either highlight and select images in Windows Explorer and drag them to a folder icon in the wizard's left panel, or click the wizard's **Batch Files...** button

Actions

Genebanks can use GG actions to track and manage the status of genebank processes. Action codes can be customized to meet the genebank's specific needs. Genebanks that systematically record actions can then later query the actions to determine the status of an order request, the history of an accession or inventory management at the genebank.

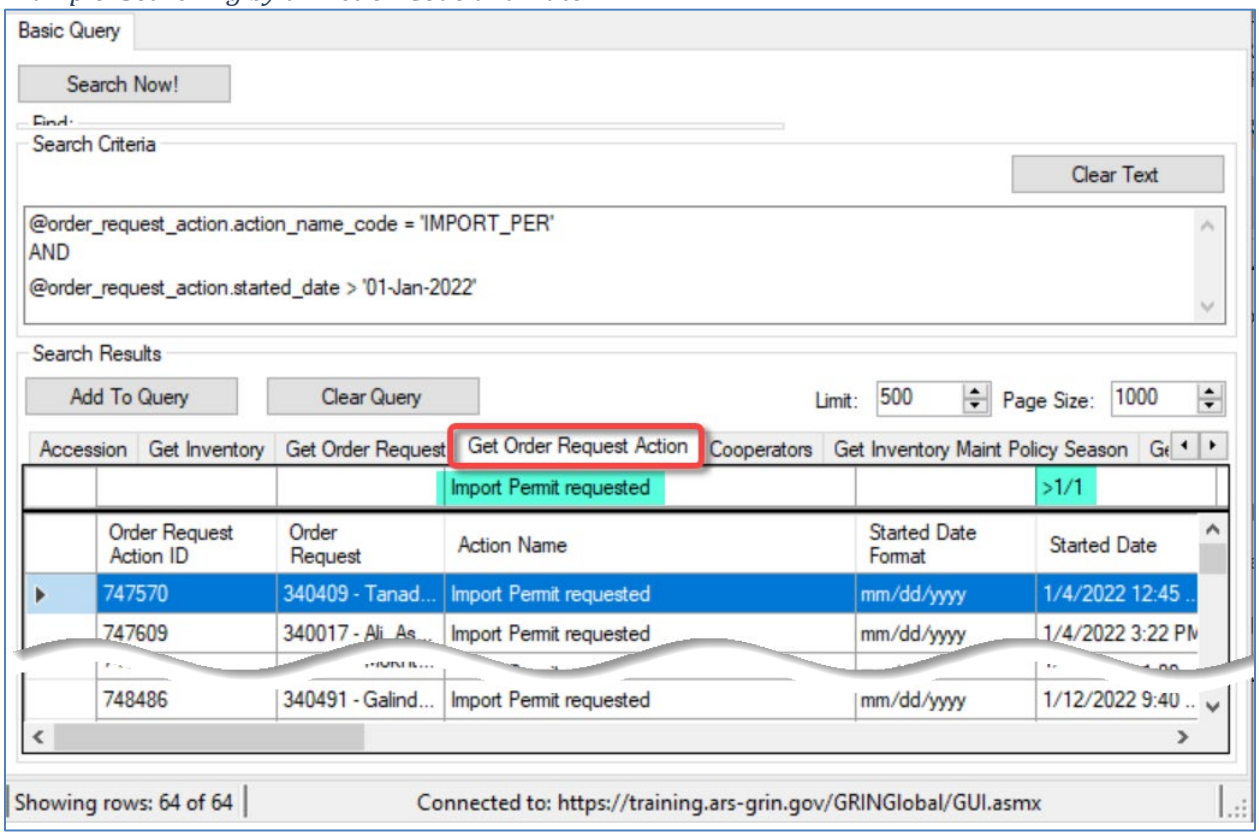
GRIN-Global has 3 action tables:

- Accession
- Inventory
- Order Requests

Actions are genebank specific:

- Coded values
- The genebank's GG IT manager can add / modify the codes

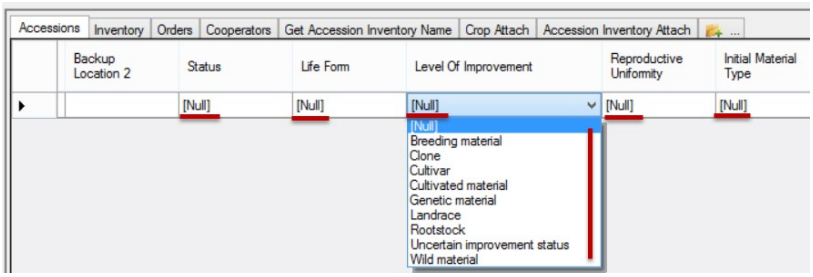
Example: Searching by an Action Code and Date:



Customization: Configuring an Organization's GG Installation

Codes and Code Groups

Dataviews use codes and data values to guide users in selecting valid data. Ideally, an organization will edit and decide on codes before implementation. To ensure consistency and standards, typically one person at the genebank will have the responsibility to maintain the genebank's codes. These can be maintained using the Admin Too or within the Curator Tool, the proper Code dataviews.



Triggers

Many triggers are installed automatically during the GG installation. A trigger is "discrete programming code that executes in response to certain conditions or events or certain values stored in a database table." Organizations using GG have the flexibility to enable or disable the triggers within the GRIN-Global Admin Tool.

Dataviews & Reports

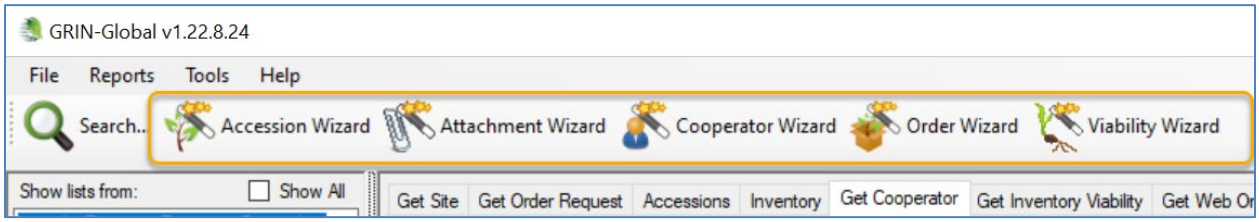
Dataviews can be easily modified; new dataviews, including PW report dataviews, can be added or edited to meet specific genebank needs. The GG Admin Tool is used to add dataviews and dataview web reports.

Languages

GRIN-Global can be modified to be displayed in languages other than English. The Curator Tool's column headings are updated by the GG administrator using the Admin Tool. Additionally, the Curator Tool has several "language" dataviews that are used for language customization.

Wizards

The CT is bundled with a few wizards. (Accession, Attachment, Cooperator, Order, and Viability) Their icons/buttons will be displayed below the menu:



Additional Wizards have been created by other genebanks that use GRIN-Global. They can be installed separately. Each wizard will have specific requirements. They often involve installing dataviews as well. One repository for community developed wizards is at https://gitlab.com/GRIN-Global/Wizards Wizards are installed on the Curator Tool user's PC.

Public Website (PW)

The Public Website (PW) is used by germplasm requestors to review and order germplasm. However, genebank staff will use it to search for accessions, observations, taxonomy, etc.

Reference: review the online Help file at https://www.grin-global.org/help_pw2

Public Website: 3 Sets of Users

Categories	Logged In?	Privileges
Information Seekers	N	Can view all data marked as "visible"
Germplasm Requestors	Y	Can order germplasm; review their order history; submit attachments
Genebank Staff*	Y	Have access to additional dataview PW reports; can run SQL queries

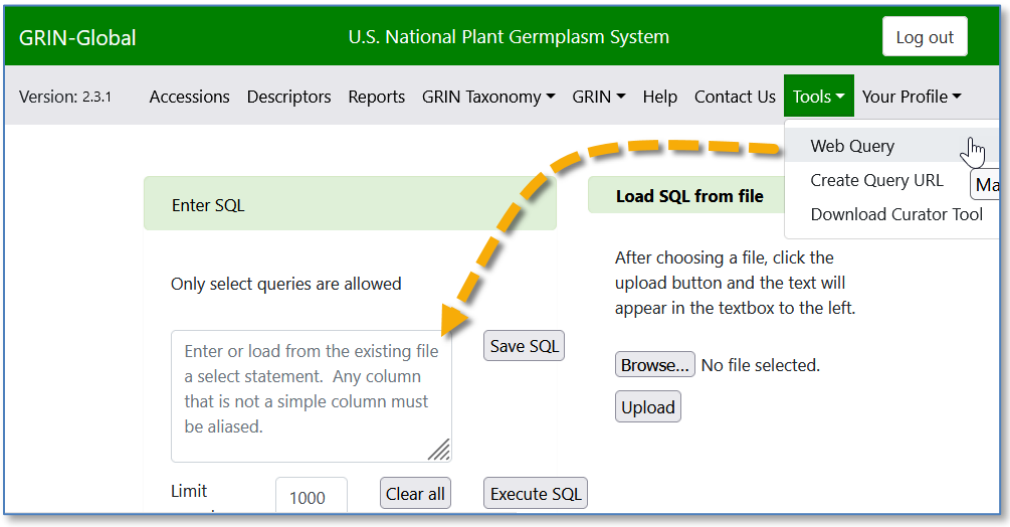
* the GG DBA must link a staff person's CT and PW accounts

Searching with SQL Queries

The Public Website has a feature in which you can submit SQL statements to run Read-only queries. With SQL queries, you can access curatorial data as well as GG schema information.

For details and examples, refer to the page: https://www.grin-global.org/sql_examples.htm Many query examples are in the document: https://www.grin-global.org/docs/gg_sql_examples.docx

Your PW account must be associated to your Curator Tool account by the GG administrator. (Contact your GG administrator for more information.)

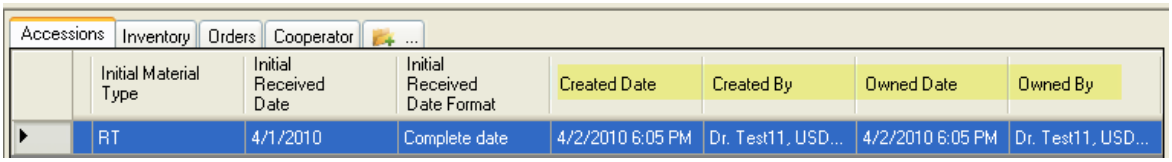


Security: Ownership and Permissions

Overview

An owner *usually* can update or delete records which she has created. Several points to remember:

- only one owner per record
- an owner can transfer ownership to another user
- an owner can provide permissions (Read, Update, Delete) to multiple users
- permission groups can be created by the GG admin to provide specific updating and deleting permissions to members designated as members in the group



In some cases, the person creating the record is not necessarily the owner of the record. For example, Inventory records are assigned the same owner as the owner of the Inventory Maintenance Policy that was used to create the Inventory record.

Reference: review https://www.grin-global.org/docs/gg_security.docx

Viability Testing

Reference

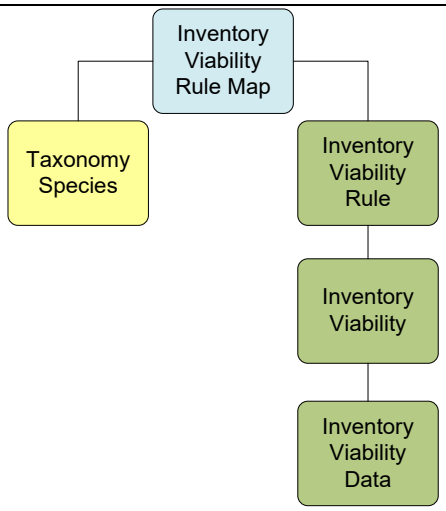
Online guide: https://www.grin-global.org/docs/gg_viability_wizard.docx Refer to the GG online dictionary for descriptions of each field.

The GRIN-Global Viability table family has several interrelated tables.

Each record in the **Inventory Viability Data** table represents one replicate of a test. The **Inventory Viability** table summarizes each test's set of replicate data.

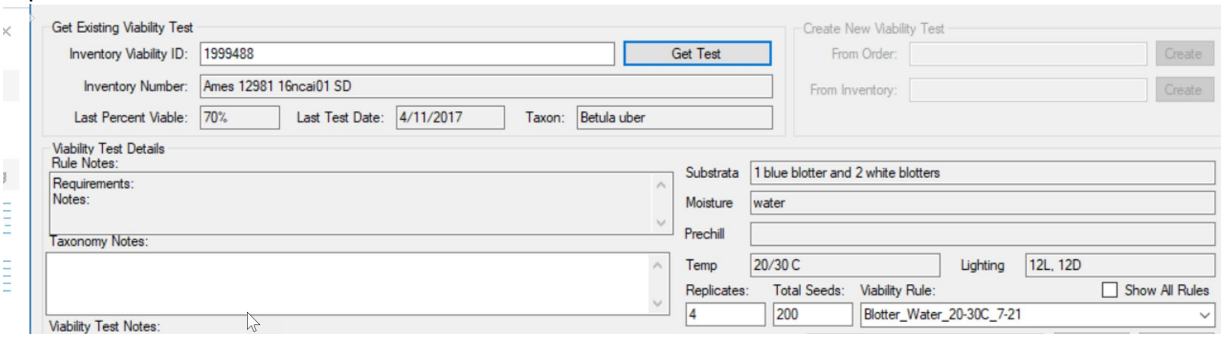
The **Inventory Viability Rule** describes the germination test conditions including the temperature range, the moisture, lighting, etc.

The **Rule Map** is primarily a means to associate rules with specific taxons; later when testing an accession, a subset of rules typically used for that taxon will be initially available for selection.



Viability Wizard

The Viability Wizard enables a genebank to create germination tests and record the results for each replicate.



Genebanks often batch their germination tests at times for specific crops. Within the Order Wizard, it is possible to set up batch requests for germination tests and then track the testing of the multiple lots.