

Viability Wizard



Revision Date

July 13, 2021

[Appendix D](#) contains revision notes pertaining to this document.

This document is online at https://www.grin-global.org/docs/gg_viability_wizard.docx Please consider not printing, as these GG documents are periodically updated.

Author

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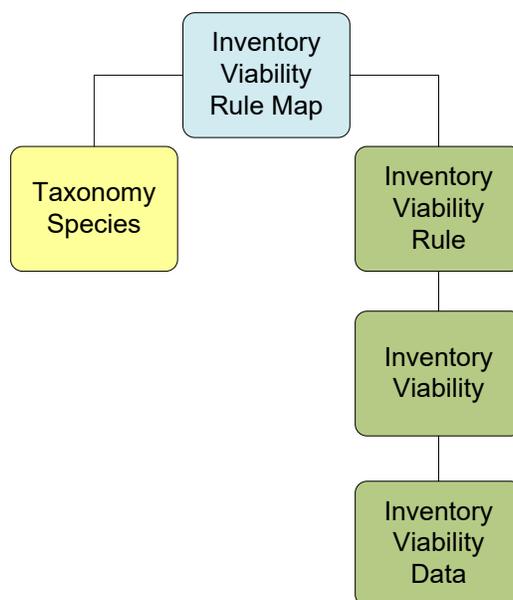
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Background

Seed or plant viability is the measure of how many seeds or how much plant material in a lot are alive and could develop into plants that will reproduce under appropriate field conditions. Viability testing is crucial for the monitoring of seed conservation. CGIAR has a detailed discussion of viability testing [online](#).

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



In GRIN-Global, four Inventory viability-related dataviews are particularly important. The wizard is used to record the raw data results from germination tests into a results (summary) table.

Dataview	Purpose
get_inventory_viability	Summary table that aggregates (“rolls up”) the individual results of seed germination tests.
get_inventory_viability_data	Contains the raw data results of seed germination tests
get_inventory_viability_rule	Specifies the conditions used in a germination test – the lighting conditions, optimal temperature, the substrata, days between counts, number of replicates, etc. Generally, protocols have been developed that work best for different taxa. Viability rules are stored in their own table; when a new viability test is to happen, the rule that is relevant can be selected, rather than spell out the individual conditions of the test every time a viability test is to be given.

get_inventory_viability_rule_map	The map table makes it possible to link multiple taxons (species_IDs) with multiple rules. (One viability rule may apply to many taxa.)
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[Dataview Examples](#) are in shown in Appendix B.

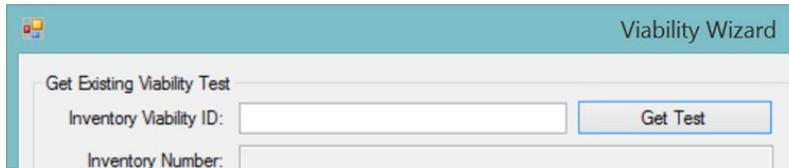
The **Viability Wizard** consists of one main window from which you can either retrieve an existing viability test ([Get Existing Viability Test](#)) or create a new test ([Create New Viability Test](#))

Click one of the links above, depending on your interest.

Retrieve (Get) an Existing Test

Get Test

To retrieve an existing viability test, use the textbox adjacent to the **Inventory Viability ID:** label.



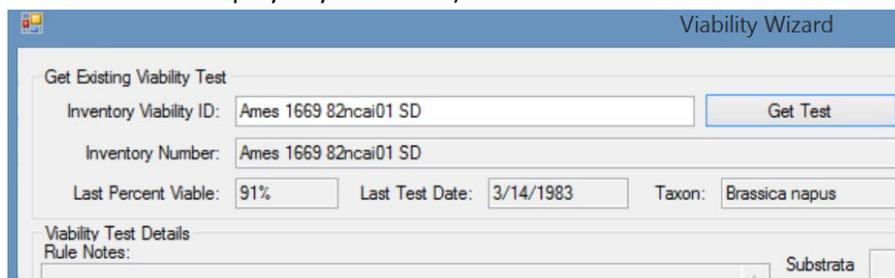
Input one of the following valid alternatives:

- an existing viability test ID (Ex: **1984882**)
- a viability test's specific replicate # (Ex: **1984882.1** , Ex: **1984882.2** ...)
- an inventory number (Ex: **Ames 20217 REI SD**)



Entering a viability test's specific replicate is the preferred method. A replicate is designated by a suffix. For example, **1984882.1** indicates the first replicate of test 1984882, **1984882.2** the second, and so on. When inputting a specific replicate, you are restricted to editing that replicate's data only, which helps avoid data entry errors. (You will still be able to see the other replicates' data.)

Entering the inventory number is useful when investigating concerns regarding the viability of seeds in a packet. When entering an inventory number, the most recent viability test for that inventory will be retrieved. (If that inventory does not yet have a viability test, presently the wizard does not display any feedback.)



When you scan the inventory number barcode from a seed packet, the *latest* viability test will be displayed. You can then review everything about that test including specific counts, method, notes (including rule, taxonomy, test, and individual replicates notes), pre-chill, and any other viability test information.



Viability test labels generated by the Viability Wizard contain 2D barcodes which include the specific replicate or the viability test. When one of these labels are scanned, the Viability Wizard will retrieve the data for that respective viability test or replicate. You can then edit that data.

Inputting the viability test with a replicate number displays the count data for the *one replicate*:

Viability Wizard

Get Existing Viability Test
 Inventory Viability ID: 1985103.2
 Inventory Number: Ames 1965 83nca01 SD
 Last Percent Viable: 96% Last Test Date: 1/20/2017 Taxon: Amaranthus caudatus

Viability Test Details
 Viability Date: 1/20/2017
 Viability Count Data

Rep	Seeds	Norm	Abn	Dom	Hard	Empty	Infest	Dead	Unkn	Est Dom	Tit Dom	Crf Dom	Note
1	50	100.0%	42	4	4								
2	50	100.0%	42	2									
3	50	100.0%	45		5								
4	50	100.0%	44	3	3								
Viability Summary		200	100.0%	179	9	12							

When entering the viability_ID, all of the replicates can be edited:

Viability Wizard

Get Existing Viability Test
 Inventory Viability ID: 1985103
 Inventory Number: Ames 1965 83nca01 SD
 Taxon: Amaranthus caudatus

Viability Date
 1/20/2017 Count 2

Viability Count Data

Rep	Seeds	Norm	Abn	Dom	Hard	Empty	Infest	Dead	Unkn	Est Dom	Tit Dom	Crf Dom	Note
1	50	100.0%	42	4	4								
2	50	100.0%	48	2									
3	50	100.0%	45		5								
4	50	100.0%	44	3	3								
Viability Summary		200	100.0%	179	9	12							

When entering an inventory_ID, the most recent Inventory Viability test is displayed:

Viability Wizard

Get Existing Viability Test
 Inventory Viability ID: MR 420171 BEZ SD
 Inventory Number: MR 420171 BEZ SD
 Last Percent Viable: Last Test Date: 4/21/2017

Viability Test Details
 Rule Notes: Sensitive to low temperature
 Substrata: paper towels

Viability Count Data

Rep	Seeds	Norm	Abn	Dom	Hard	Empty	Infest	Dead	Unkn	Est Dom	Tit Dom	Crf Dom	Note
1	50	0.0%	0										
2	50	0.0%	0										
3	50	0.0%	0										

Viability Test Details

On the main window, the **'Viability Test Details'** section displays the viability test parameters for the viability rule currently selected for the viability test being edited:

The information on the Viability Wizard main page includes testing procedure parameters and other useful information from several GG tables.

GRIN-Global Table	Fields
inventory_viability_rule	Substrata, Moisture, Prechill, Temp, Lighting, Replicates, Total Seeds, Rule Notes
inventory_viability_rule_map	Taxonomy Notes
inventory_viability	Viability Test Notes

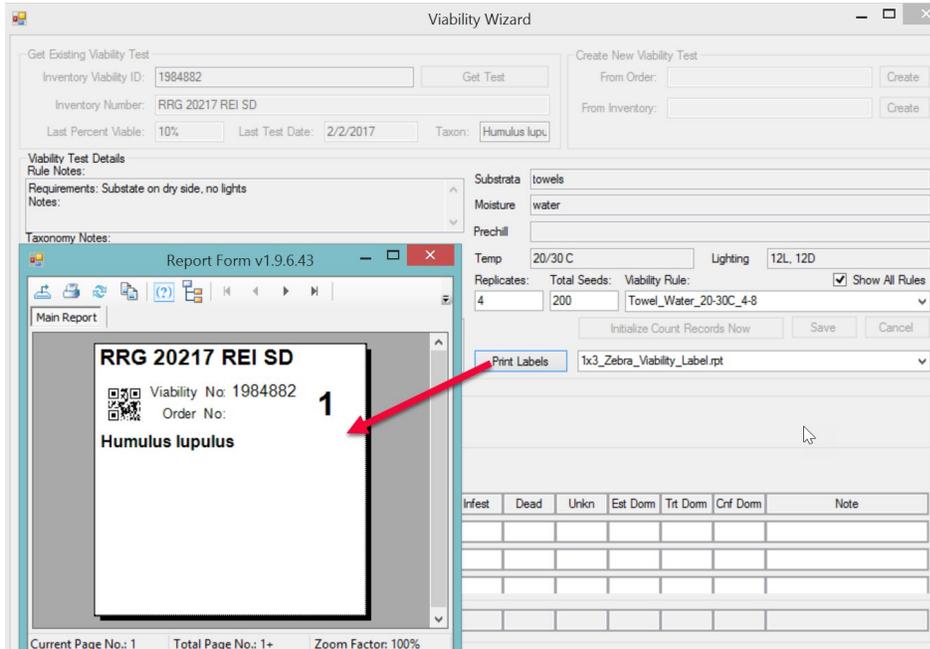
Show All Rules

By default, the **Show All Rules** checkbox is unchecked. Only viability rules currently associated with the taxonomy species being tested are displayed in the **Viability Rule** dropdown list. When selected, the **Show All Rules** checkbox will display all available viability rules.

Print Labels Button

Click the **Print Labels** button as needed. Also, note that the label has a barcode symbol.

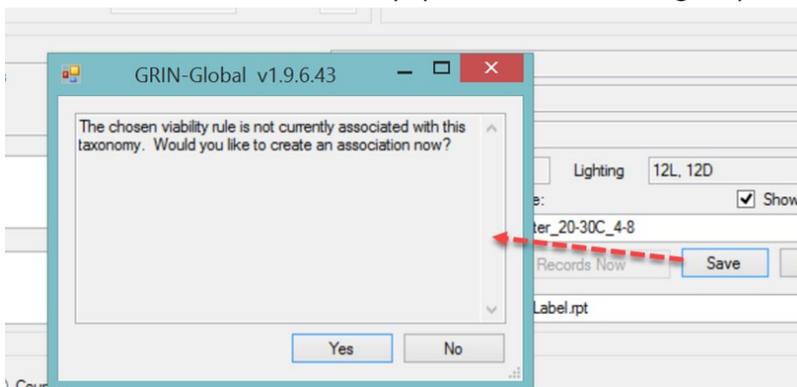
Later, this symbol can be scanned and be used to invoke the Viability Wizard to display the corresponding replicate's data. The technician can immediately begin recording new counts specifically for that replicate.



Save

When the user has changed information regarding the viability test, the **Save** button inside the **Viability Test Details** section will be enabled. Often this will be the viability rule being applied to the test.

Generally this is a trivial task – simply click **Save**. However, when a viability rule has been chosen that is not associated with the taxonomy species of the current germplasm being tested, a dialog box displays:



If you click **Yes**, an association will be made between this rule and the taxonomy species; in future tests this rule will show up in the short list of rules for this taxonomy. (A record is created in the **inventory_viability_rule_map** table linking the taxonomy species ID with the inventory viability rule ID.)

Radio Buttons – Create a New Count Row

During viability testing, multiple counts of the replicates are performed. By default, the first time the barcode is scanned to initiate entering count data for that inventory sample, the Viability Wizard creates a new radio button with the current date.

That initial date becomes the test's *start date*. *No count rows are displayed*. When seeds are pulled out of the growth chamber to conduct a subsequent first count, typically 4-7 days later, a new radio button will be created and will become the count date for that data that is being recorded on that date.



If less than 24 hours has elapsed since the latest count, the wizard will not create a new radio button; instead, the wizard will return the data that is less than 24 hours old so that you can inspect/modify the data as needed. If you intend to conduct two counts less than 24 hours apart and need an additional radio button, click on the right-most button (labeled **Count n**). When this radio button is clicked, a new set of count rows will be created

The screenshot shows the 'Viability Wizard' interface. At the top, there are fields for 'replicates' (4), 'Total Seeds' (200), and 'viability rule' (Towel_Water_20-30C_10-16). Below these are buttons for 'Initialize Count Records Now', 'Save', and 'Cancel'. A 'Print Labels' button is also present, with a dropdown menu showing '1x3_Dymo_Viability_Label.rpt'. The 'Viability Date' section has two radio buttons: one selected for '4/25/2017' and one for 'Count 2'. Below this is a 'Viability Count Data' section with a 'Change Date' button and a table with columns: Rep, Seeds, Norm, Abn, Dom, Hard, Empty, Infest, Dead, Unkn, Est Dom, Trit Dom, Crf Dom, Note. The table shows a single row with values: 1, 50, 0.0%, 0, and several empty cells.



The **Tested Date** in the Viability record is reserved for the date when the germination test is *completed*. However, the wizard inserts the date when the wizard is used to set up the test parameters. When the testing is completed, that date will be updated.

The screenshot shows a database table with the following columns: Inventory Viability ID, Inventory Viability Rule, Inventory, Test Date Format, Tested Date, Percent Normal, Percent Abnormal, and Perc Dorm. A tooltip is visible over the 'Tested Date' column, containing the text 'tested_date -- Date when the germination test was completed'. The table contains one row with the following data: 787360, NA 53225 SD, mm/dd/yyyy, 04/17/1997, tested_date --, and several empty cells.



The second counting of a test will be reflected in the total % of the first date:

Viability Date
 7/13/2021 7/14/2021 Count 4

Viability Count Data
Change Date

Rep	Seeds		Norm	Abn	Dom	Hard	Empty
1	50	90.0%	40				

How did 40/50 get converted to 90% ? The second count had 5 more normal germinations:

Viability Date
 7/13/2021 7/14/2021 Count 4

Viability Count Data
Change Date

Rep	Seeds		Norm	Abn	Dom	Hard	Em
1	50	90.0%	5				

Notes

Four different note boxes are on the main Viability Wizard window:

Note Fields Available on the Viability Wizard

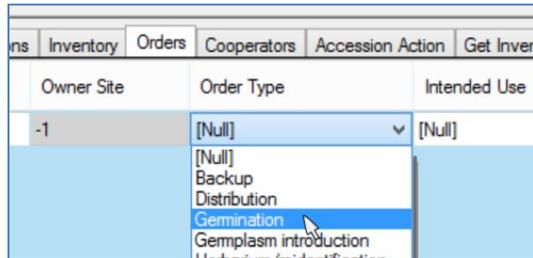
Display Name	Table	Function
Rule Notes	inventory_viability_rule	General notes about the test procedure. Applies across all taxonomy species samples which use this rule.
Taxonomy Notes	inventory_viability_rule_map	Notes detailing how the viability rule test procedure should be applied to this specific taxonomy species.
Viability Test Notes	inventory_viability	General notes about the testing process as it was applied to this particular inventory sample.
Notes on the Replicate Records	inventory_viability_data	Specific notes about the test procedures and observations for a specific replicate on a specific count day.

Create New Viability Test

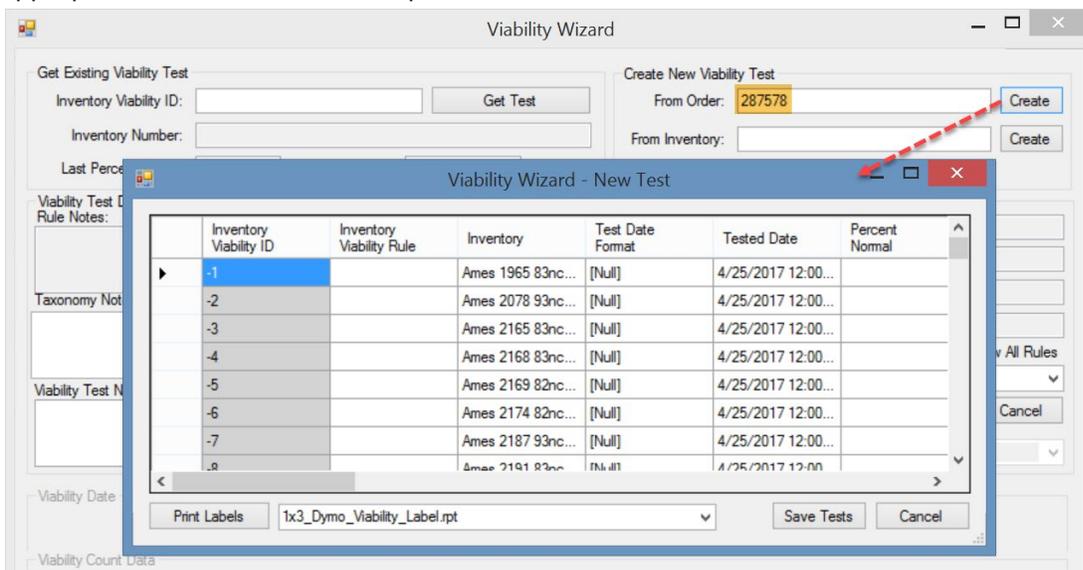
The wizard can set up inventory viability tests from either an Order or an Inventory record. When an Order is selected, tests will be established for each inventory item included in the order.



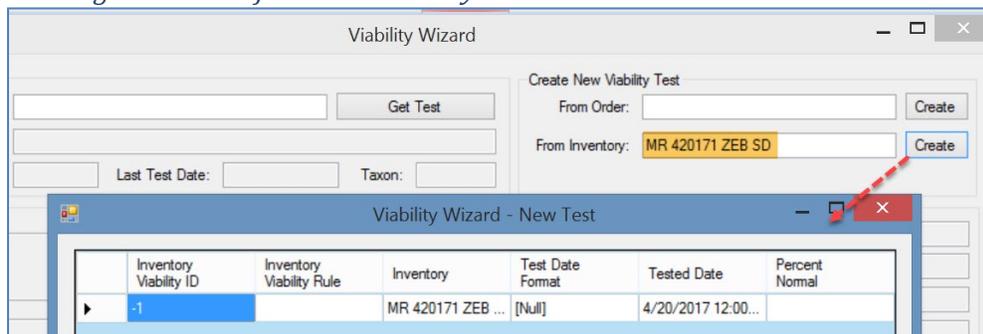
Use the **Germination** value for the **Order Type** when creating an order for viability testing.



In the Viability Wizard window, in the top right panel, enter the order or inventory value in the appropriate box; then click the respective **Create** button:

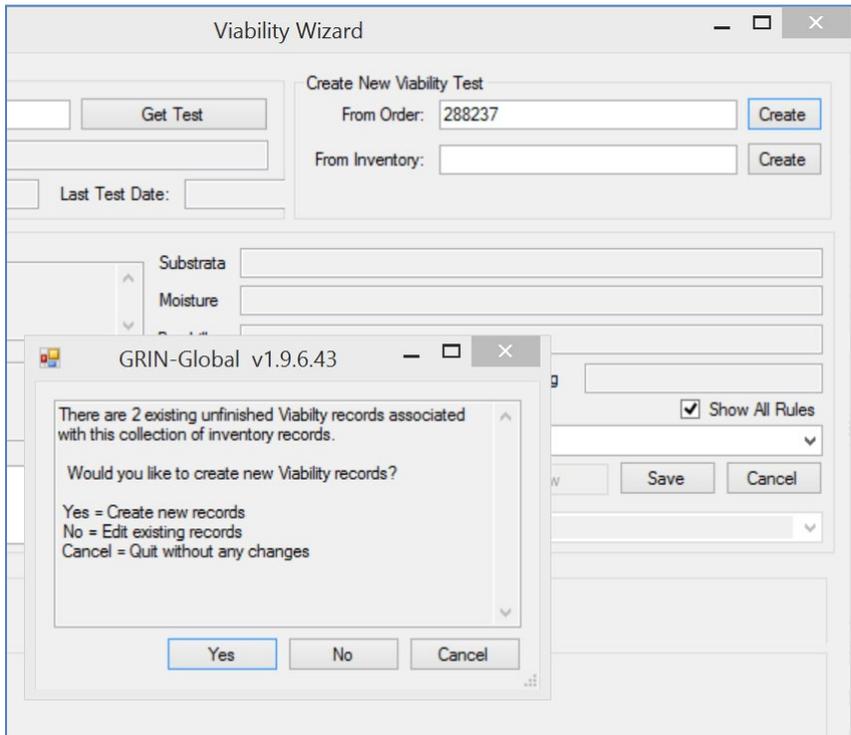


Creating a New Test from an Inventory



When selecting Order, each order item in the germination order will generate a test; otherwise, when indicating Inventory, only one test will be generated. If an open test hasn't been completed for that

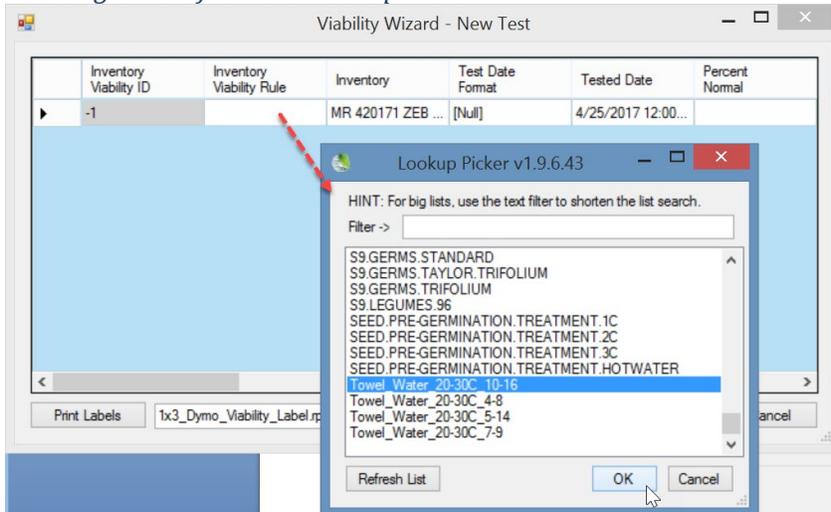
order or inventory, you will be reminded with a prompt. You can ignore the prompt and continue in creating a new test, or you can proceed with an existing test:



New Test Window

When the wizard creates a new test, the wizard initially displays a **New Test** window. Enter the viability test parameters. Some fields are filled in with defaults, whereas other must be entered to indicate the test's parameters. Typically, you will complete the **Inventory Viability Rule** field by selecting a rule from a dropdown picker. If the rule has been established with a **Sample Count** and **Replication Count** fields, these fields will be filled in automatically when you save the record, but they can be overridden when different values are more appropriate for your test situation. You can also modify any of the other fields in this table.

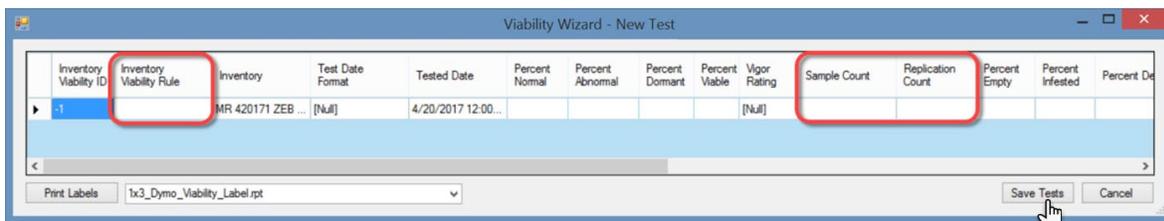
Selecting a Rule from the Lookup Picker



The **Created** and **Owned** fields are filled in when you save the record. In the current version of the VW, they are displayed in pink, but input is not required – they will automatically fill in.

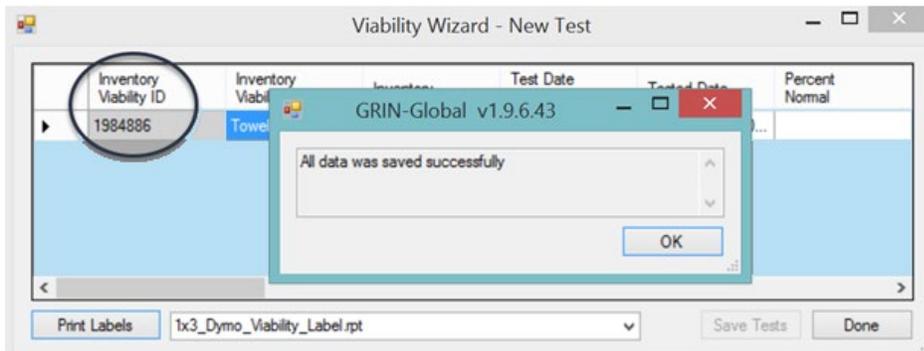


Click **Save Tests**.



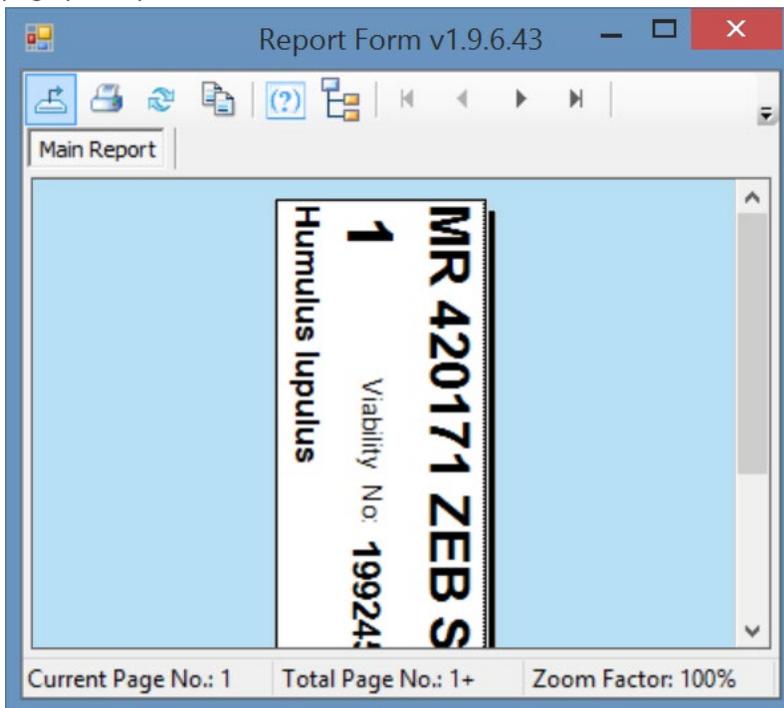
Printing Labels for Tests

The new Viability record will be generated and have its ID. Click **Print Labels**.

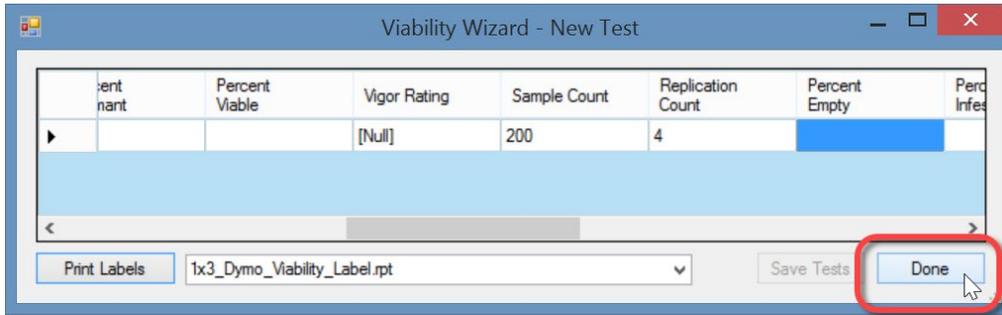


If the **Print Labels** button is not enabled after having saved your test parameters, the **Replication Count** field most likely contains invalid or missing data.

Clicking the **Print Labels** button displays the Crystal Reports **Report Form** viewer window with one label page per replicate for each test.



Click **Done**:



If you click the **Done** button instead of **Print Labels** after saving your data, the wizard will display a prompt:

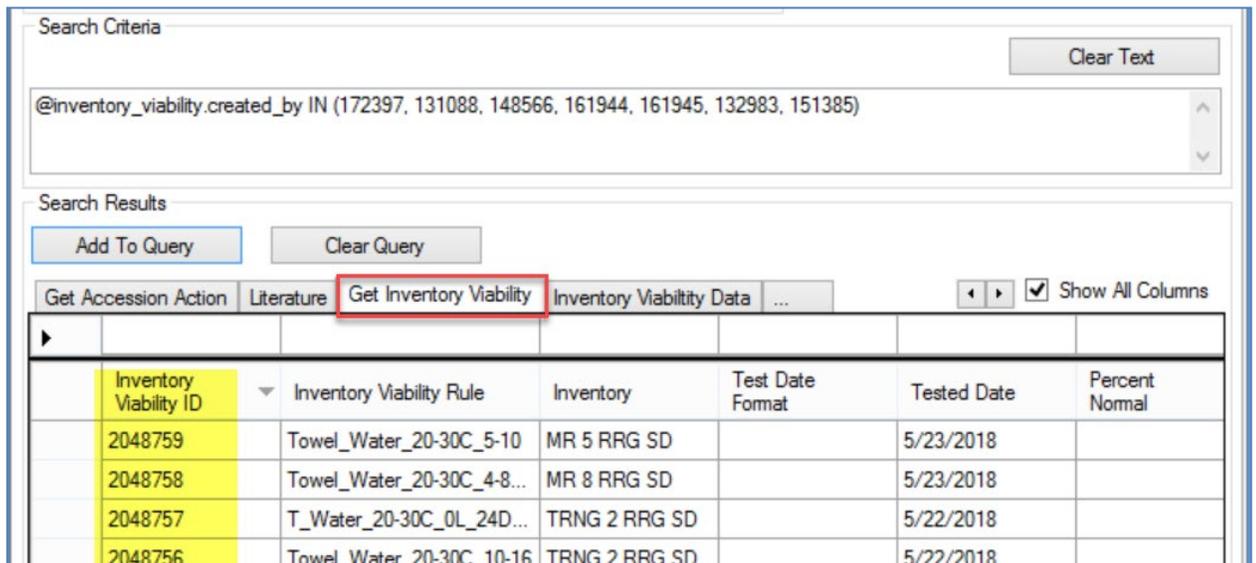


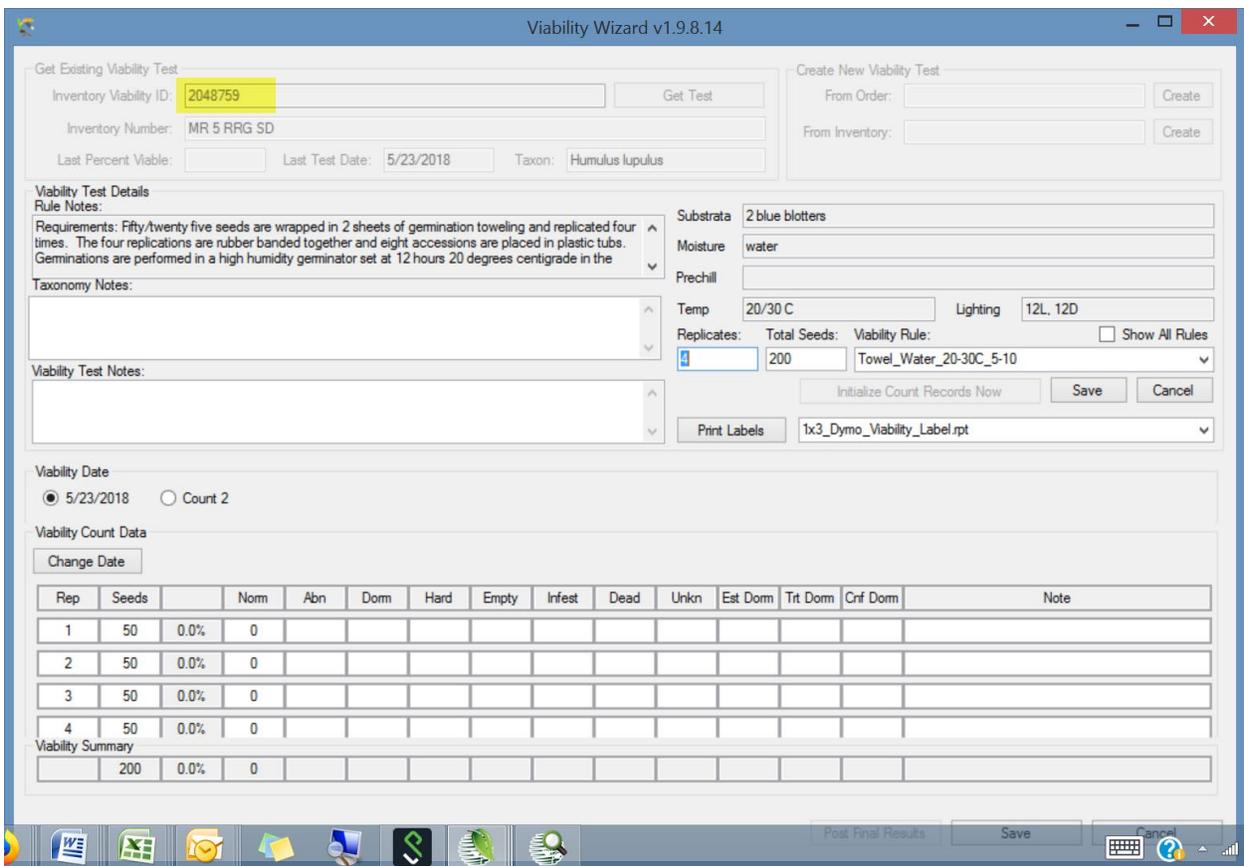
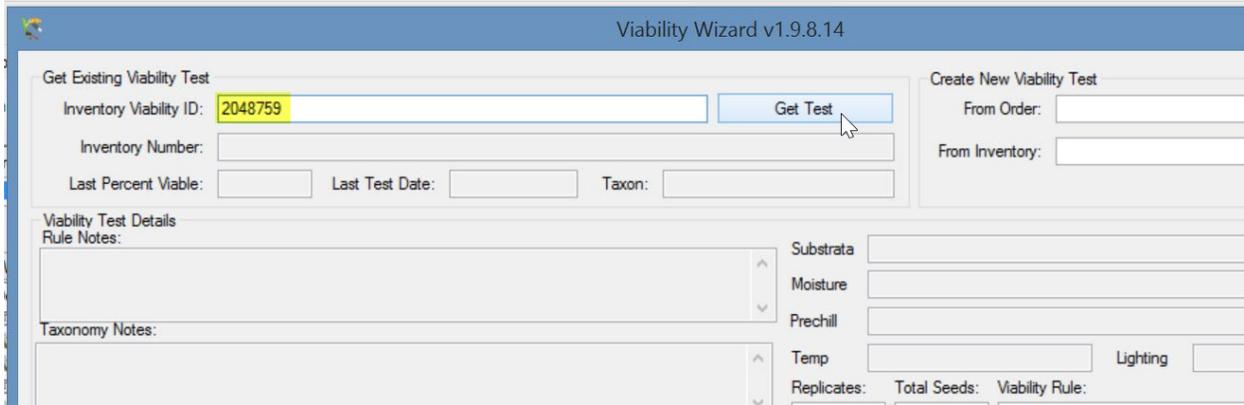
Clicking **Yes** button will display the **Viability Wizard – New Test** dialog window; you can then click **Print Labels**. If you click **No**, returns you to the main Viability Wizard window.

Searching for Viability Records



Use the Search Tool to find Inventory Viability records.





Appendix A: Installing the Viability Wizard

Overview

The Viability Wizard is available for testing; four steps must be followed. The steps are summarized here and then detailed on the following pages.

- Unzip the zip file (Step 1)
- Copy **ViabilityWizard.dll** --> **C:\Program Files (x86)\GRIN-Global\GRIN-Global Curator Tool\Wizards** (Step 2)
- The existing **AppSettings.txt** file needs to be edited and have *one line added* (Step 3)
- Two .rpt files need to be copied to your **C:\Program Files (x86)\GRIN-Global\GRIN-Global Curator Tool\Reports** folder (Step 4)

Detailed Installation Instructions

Step 1: Download and Unzip the .zip File

You need to unzip the file in order to get the respective files to be loaded on a folder on your PC. The zip file is located at http://www.ars-grin.gov/npgs/gringlobal/files/viability_wizardfiles_2017feb06.zip

Files included in the zipfile are:

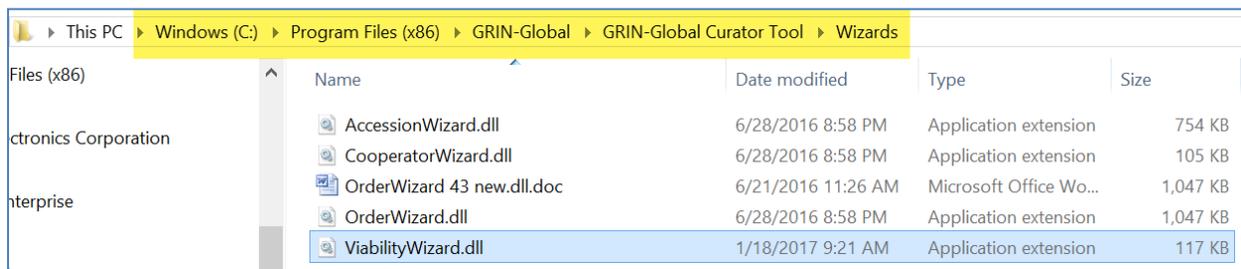
- **ViabilityWizard.dll**
- **AppSettings.txt**
- two .rpt files: **1x3_Dymo_Viability_Label.rpt** and **1x3_Zebra_Viability_Label.rpt**

In Windows Explorer, you should be able to right-click on the zip file name, and then select **Extract All...** to load the four individual files on a folder on your PC.

Step 2: Copy the Viability Wizard .dll file to the Wizards Folder

Using Windows File Explorer, copy **ViabilityWizard.dll** to

C:\Program Files (x86)\GRIN-Global\GRIN-Global Curator Tool\Wizards



Name	Date modified	Type	Size
AccessionWizard.dll	6/28/2016 8:58 PM	Application extension	754 KB
CooperatorWizard.dll	6/28/2016 8:58 PM	Application extension	105 KB
OrderWizard 43 new.dll.doc	6/21/2016 11:26 AM	Microsoft Office Wo...	1,047 KB
OrderWizard.dll	6/28/2016 8:58 PM	Application extension	1,047 KB
ViabilityWizard.dll	1/18/2017 9:21 AM	Application extension	117 KB

Step 3: Add a line to the App Settings.txt file

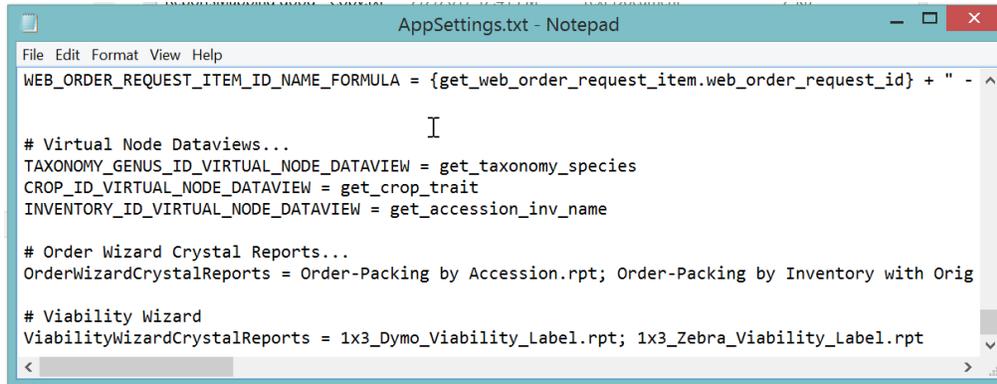
Edit your existing AppSettings.txt file which is located in the folder:

C:\Users\yourusername\AppData\Roaming\GRIN-Global\Curator Tool

Add the lines:

Viability Wizard

ViabilityWizardCrystalReports = 1x3_Dymo_Viability_Label.rpt; 1x3_Zebra_Viability_Label.rpt

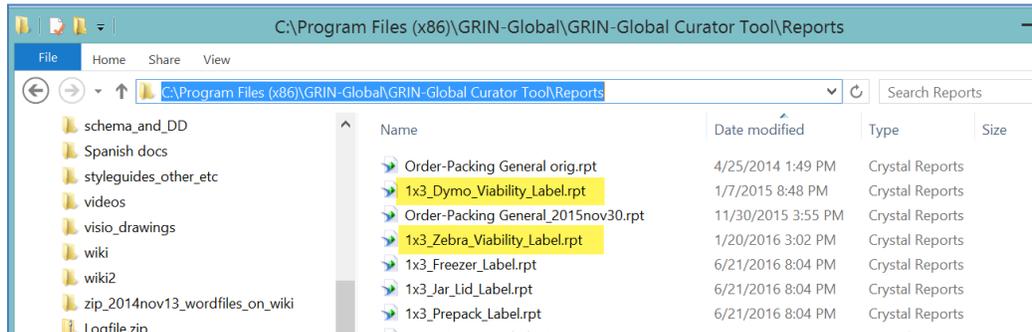


```
AppSettings.txt - Notepad
File Edit Format View Help
WEB_ORDER_REQUEST_ITEM_ID_NAME_FORMULA = {get_web_order_request_item.web_order_request_id} + " - ^
# Virtual Node Dataviews...
TAXONOMY_GENUS_ID_VIRTUAL_NODE_DATAVIEW = get_taxonomy_species
CROP_ID_VIRTUAL_NODE_DATAVIEW = get_crop_trait
INVENTORY_ID_VIRTUAL_NODE_DATAVIEW = get_accession_inv_name
# Order Wizard Crystal Reports...
OrderWizardCrystalReports = Order-Packing by Accession.rpt; Order-Packing by Inventory with Orig
# Viability Wizard
ViabilityWizardCrystalReports = 1x3_Dymo_Viability_Label.rpt; 1x3_Zebra_Viability_Label.rpt
```

(Any line with a # preceding it is a comment line)

Step 4: Copy the Viability Wizard Report (.rpt) files to the PC

Two .rpt files need to be copied to your **C:\Program Files (x86)\GRIN-Global\GRIN-Global Curator Tool\Reports** folder.



Step 5: Restart your Curator Tool

Appendix B: Viability-related Dataview Examples

Inventory Viability Rule

Specifies the conditions used in the germination tests.

Code Value	Code Value Language	Get Crop Trait	Crop Trait Observation	Site W6 Inventory	Get Order Request Item	Inventory Viability Rule							
Inventory Viability Rule ID	Name	Substrata	Seeds Per Replicate	Number of Replicates	Requirements	Temperature Range	Category	Count Regime Days	Moisture	Prechill	Lighting	Note	
495786	PULLMAN GER...	towel	25	4	Substrate towel...	20 C const...		count at 7, 14	H2O	none	12 days/12 night		
495806	B_Water_5C_12...	B=between blotters	50	4		5C		7, 14, 21	Water		12L/12D		
495820	S9.GERMS.GRA...				Seeds are held at room temperature for 4 weeks prior to planting. Seeds are planted on sand with 0.1% KNO3 in the initial								
495821	TB_Water_20-30...	TB=top of blotters	50	4		20/30C		4, 10	Water		12L/12D		
495822	TB_Water_25C...	TB=top of blotters	50	4		25C		7, 14	Water	28 days at 5C	12L/12D	S24H=Soak hours in 1m Ethephon...	
495823	TB_Water_20-30...	TB=top of blotters	50	4		20/30C		5, 14	Water		12L/12D		
495824	TB_KNO3_20-30...	TB=top of blotters	50	4		20/30C		4, 7, 14	KNO3 (0.1%)	21 days at 5C	12L/12D		
495825	GSOR.MPING.G...				30 DEGREE C X 2								
495826	TB_KNO3_20-30...	TB=top of blotters	50	4		20/30C		3, 7, 14	KNO3 (0.1%)		12L/12D		
495827	(B)_Blotter_H2O...	(B) Between blott...	50	4	B: between blotters at	20-30C		3, 10	(H2O) Tap Water				

Inventory Viability

These are the viability summary records that have the combined data from their respective **Inventory Viability Data** records.

Code Value	Code Value Language	Get Crop Trait	Crop Trait Observation	Site W6 Inventory	Get Order Request Item	Inventory Viability Rule	Inventory Viability													
Inventory Viability ID	Inventory Viability Rule	Inventory	Test Date Format	Tested Date	Percent Normal	Percent Abnormal	Percent Dormant	Percent Viable	Vigor Rating	Sample Count	Replication Count	Percent Hard	Percent Empty	Percent Infested	Percent Dead	Percent Unknow	Note			
2036402	PULLMAN.GERM...	PI 578087 94ncf0...	mm/dd/...	12/28/2017			1	98		97	4				2		178 sprouts			
2047872	PULLMAN.GERM...	PI 590588 95o SD	mm/dd/...	1/4/2018 12...			4	99		100					1		217 sprouts			
2043046	(B)_Blotter_H2O...	NSSL 182792 01 SD	mm/dd/...	03/13/2018						50	1									
2043063	(B)_Blotter_H2O...	NSSL 182884 01 SD	mm/dd/...	03/13/2018						50	1									
2039322	TB_Water_20-30...	PI 464481 84ncal0...	mm/dd/...	04/09/2018	89	2	0	89		200	4	0	0	0	9	0				
2036336	PULLMAN.GERM...	PI 357358 72ncal0...	mm/dd/...	09/08/2017			0	98		98	4				2		213 sprouts			
2043328	TB_Water_20-30...	PI 358070 17ncal0...	mm/dd/...	04/11/2018	63	1	0	63		200	4	0	1	0	35	0				
2038218	S9.GERMS.GRA...	Grif 17807 or SD	mm/dd/...	02/05/2018	43	0	0	43		100	1	0					0.1% KNO3; Rc			
2038200	S9.GERMS.GRA...	Grif 17789 or SD	mm/dd/...	02/05/2018	61	0	0	61		100	1	0					0.1% KNO3; Rc			
2038320	S9.GERMS.GRA...	Grif 17889 or SD	mm/dd/...	02/05/2018	69	0	0	69		100	1	0					0.1% KNO3; Rc			
2038149	S9.GERMS.GRA...	Grif 17739 or SD	mm/dd/...	02/05/2018	16	0	0	16		100	1	0					0.1% KNO3; Rc			

Inventory Viability Data

Each record in the **Inventory Viability Data** table represents one replicate of a test.

Inventory Viability Data ID	Inventory Viability	Inventory	Order Request Item	Counting Cooperator	Replication Number	Count Number	Count Date	Normal Count	Abnormal Count	Domant Count
101528	2048758	MR 8 RRG SD		Reisinger, Martin ...	1	1	5/21/2018	0	4	10
101529	2048758	MR 8 RRG SD		Reisinger, Martin ...	2	1	5/21/2018	0		
101530	2048758	MR 8 RRG SD		Reisinger, Martin ...	3	1	5/21/2018	0		
101531	2048758	MR 8 RRG SD		Reisinger, Martin ...	4	1	5/21/2018	0		
101532	2048758	MR 8 RRG SD		Reisinger, Martin ...	1	2	5/23/2018 3:31 ...	0	8	
101533	2048758	MR 8 RRG SD		Reisinger, Martin ...	2	2	5/23/2018 3:31 ...	0		
101534	2048758	MR 8 RRG SD		Reisinger, Martin ...	3	2	5/23/2018 3:31 ...	0		
101535	2048758	MR 8 RRG SD		Reisinger, Martin ...	4	2	5/23/2018 3:31 ...	0		

Inventory Viability Rule Map

This dataview reflects the mapping of a viability rule mapped to multiple species records.

Inventory Viability Rule Map ID	Inventory Viability Rule	Taxon	Note	Created Date	Created By	Modified Date	Modified By
1052	Towel_Water_20-30C_7-9	<i>Zea diploperennis</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1053	Towel_Water_20-30C_7-9	<i>Zea hybr.</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1054	Towel_Water_20-30C_7-9	<i>Zea luxurians</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1055	Towel_Water_20-30C_7-9	<i>Zea mays</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1056	Towel_Water_20-30C_7-9	<i>Zea mays subsp. ...</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1057	Towel_Water_20-30C_7-9	<i>Zea mays subsp. ...</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1058	Towel_Water_20-30C_7-9	<i>Zea mays subsp. ...</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1059	Towel_Water_20-30C_7-9	<i>Zea mays subsp. ...</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1060	Towel_Water_20-30C_7-9	<i>Zea nicaraguensis</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		
1061	Towel_Water_20-30C_7-9	<i>Zea perennis</i>		4/2/2017 10:04 ...	Cyr, Peter, USDA...		

Appendix C: Pure Live Seed

Pure Live Seed (Calculating Live Seed by Using Germination Test Rates)

In server release 1.10.3, a calculated field was added to the Inventory dataview. The calculation is derived by multiplying the quantity on hand with the latest germination percentage to get “pure live seed” (the actual number of viable seed propagules).

For example, if you have 1000 seeds and the germination test says 50%, then you only have 500 seeds that are viable.

The following code can be used in the Search Tool:

```
WHERE inventory_number_part1 = 'Ames'  
AND quantity_on_hand > regeneration_critical_quantity  
AND inventory_viability.inventory_viability_id IS NOT NULL  
AND dbo.fn_i_pureliveseed(inventory.inventory_id) < regeneration_critical_quantity
```

(Ames is used here as an example)

Refer to the online Search document https://www.grin-global.org/docs/gg_searches.docx for an expanded illustration.

Appendix D: Revision Notes

Changes in this Document

– July 13, 2021

- multiple wording changes to reflect recent changes to the wizard

– October 18, 2019

- a few, minor very wording changes

– July 22, 2019

- minor edits regarding searching by inventory ID