Viability testing with GGCE

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Viability testing

When do you test seed viability?

Post harvest: Initial seed viability

- Is seed of sufficient quality **before storage**?

Conservation: Monitoring seed viability

- Is seed still of sufficient quality?
- Repeat monitoring **every X years** in long-term storage

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Procedure

What is your SoP?

Prepare for testing

1. Determine material to be tested
2. Obtain sample for testing

Test viability of the sample

1. Prepare material for test (according to SoP)
2. Monitor test sample and record progress
3. Finish test and record results

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Example 2x25

How to go about viability testing with GGCE?

- One sample
- Two replicates
- Each replicate with 25 seed
- Multiple observations
- Final results

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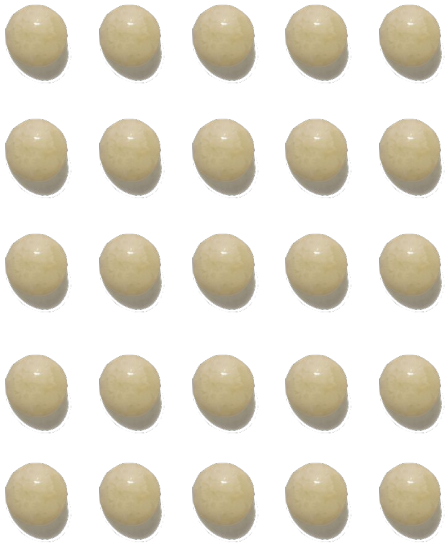
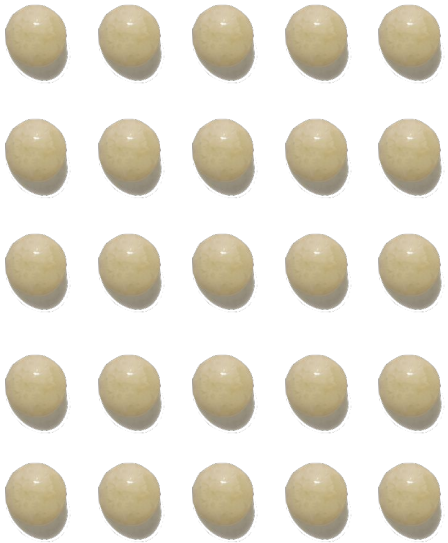
Replicate 1

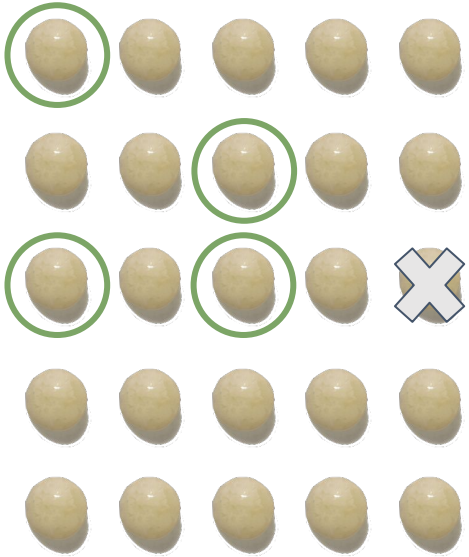


Replicate 2

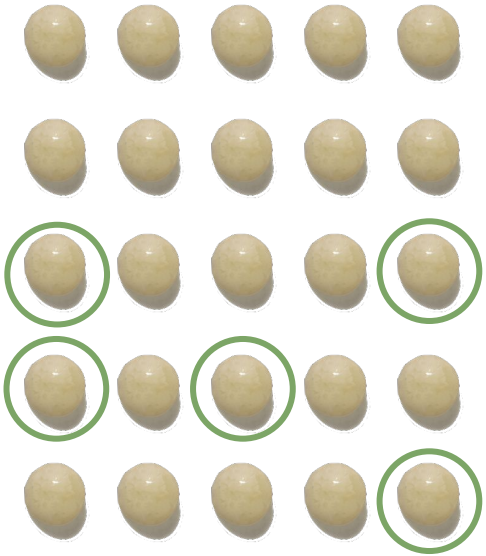


Two replicates with 25 seed each

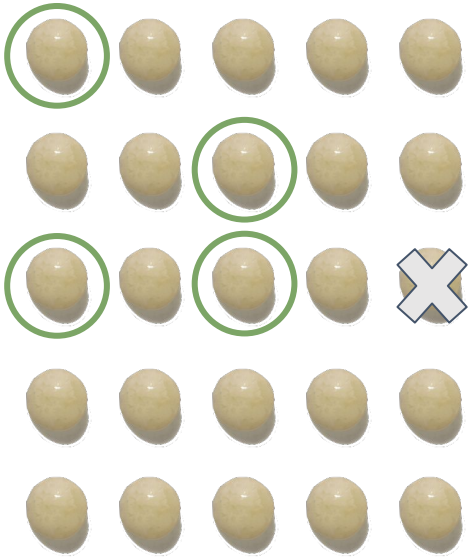
Replicate 1

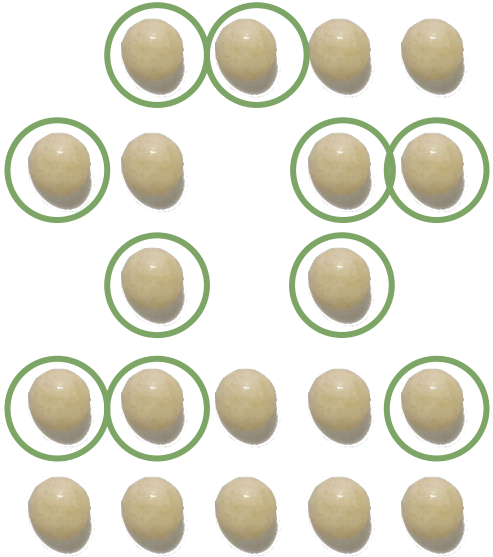


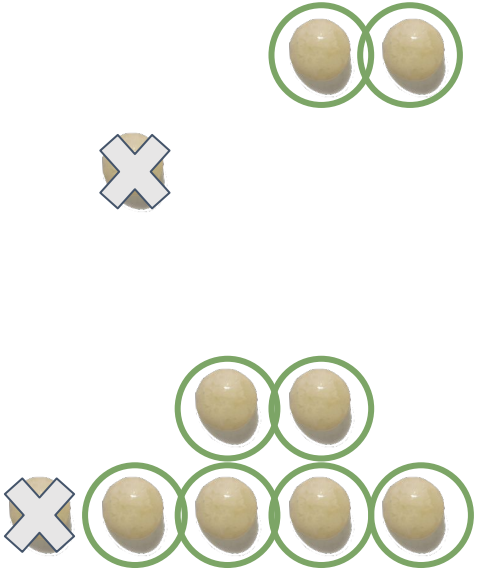
Replicate 2



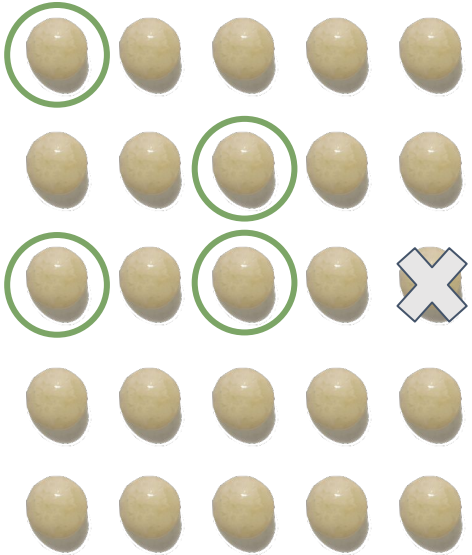
Replicate 1



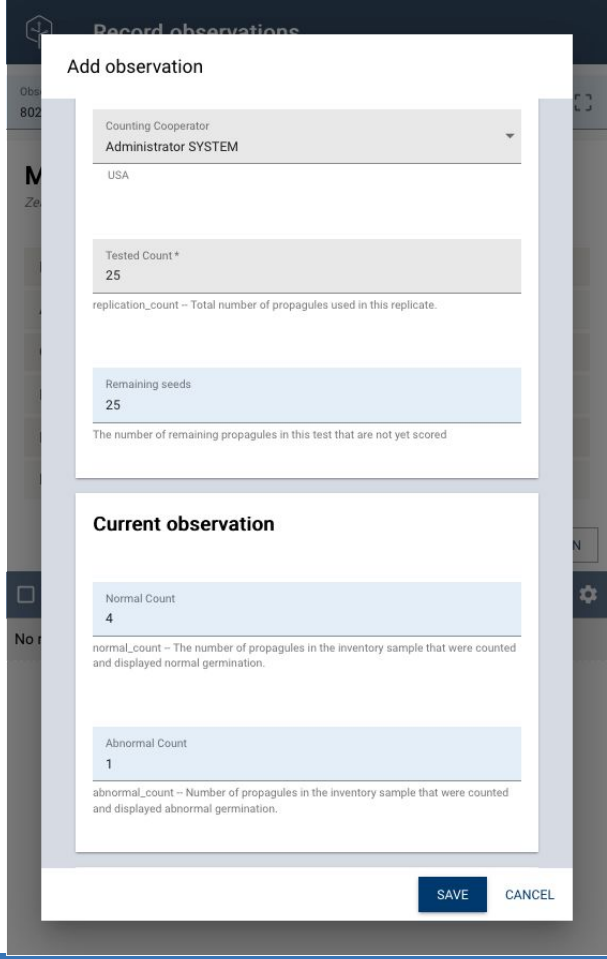




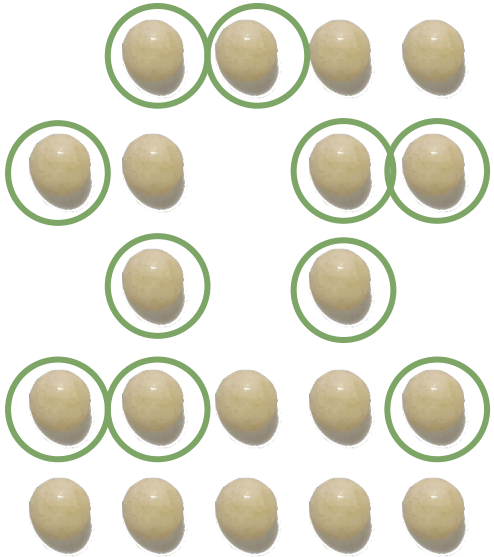
Replicate 1



Normal: 4
Dead: 1



Replicate 1



Normal: 10
Dead: 0

Record observations

Observation barcode
8.1

IG1 1 SD

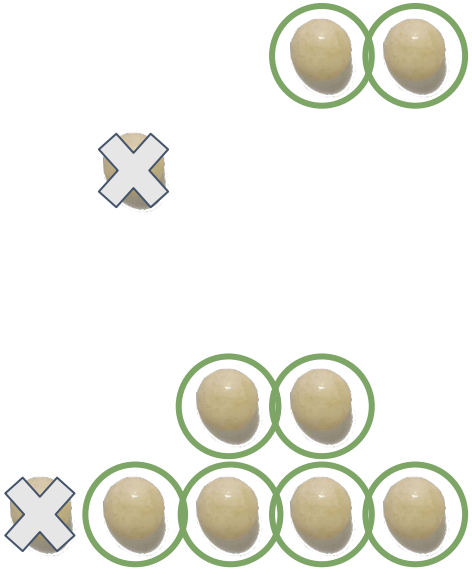
Lens culinaris subsp. *culinaris*

Inventory	IG1 1 SD
Accession	IG 1
Quantity On Hand	2,000 Seed
Inventory Type	Seed
Inventory Viability Rule	2x25
Remaining seeds	10

VIEW TEST | ADD OBSERVATION

	Count Number	Normal Count	Abnormal Count	Estimated Dormant Cc
1	2	10		
2	1	4	1	

Replicate 1



Normal: 8
Dead: 2

Record observations

Observation barcode

IG1 1 SD

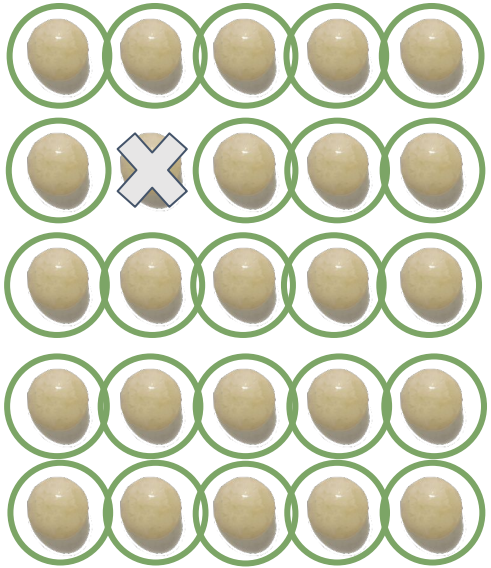
Lens culinaris subsp. *culinaris*

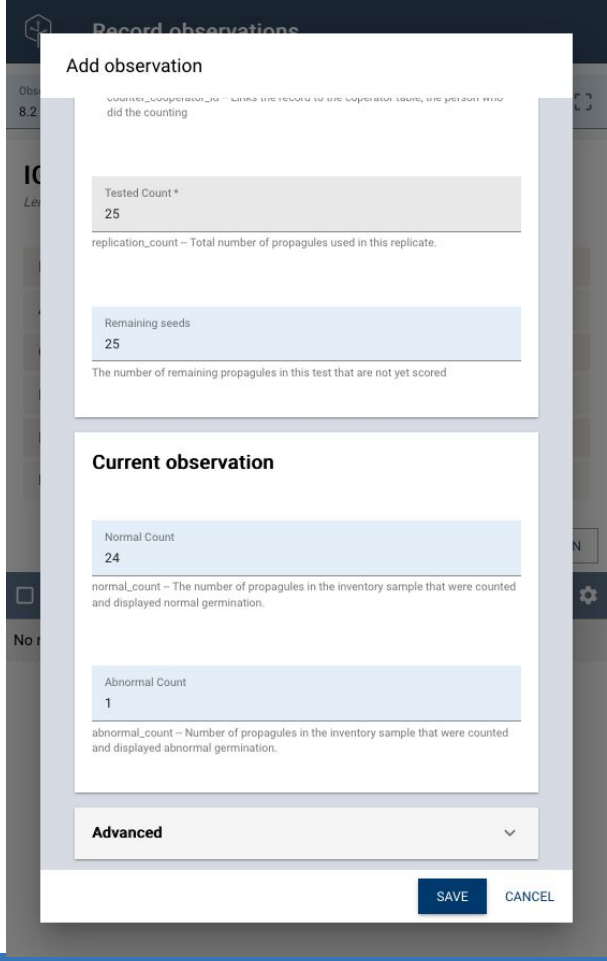
Inventory	IG1 1 SD
Accession	IG 1
Quantity On Hand	2,000 Seed
Inventory Type	Seed
Inventory Viability Rule	2x25
Remaining seeds	0

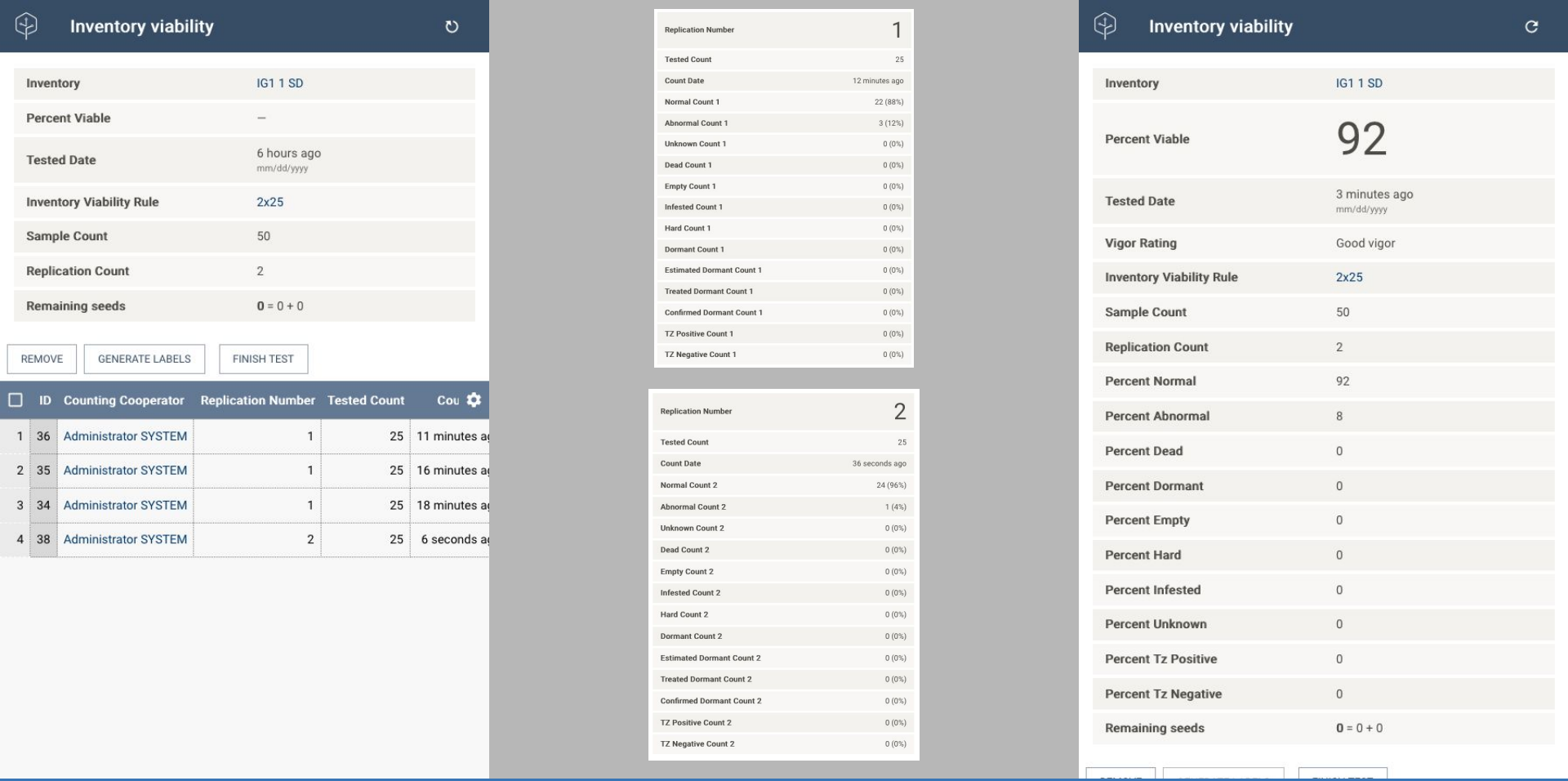
VIEW TEST | ADD OBSERVATION

	Count Number	Normal Count	Abnormal Count	Estimated Dormant Cc
1	3	8	2	
2	2	10		
3	1	4	1	

Replicate 2




Add observation
did the counting
Tested Count *
25
replication_count -- Total number of propagules used in this replicate.
Remaining seeds
25
The number of remaining propagules in this test that are not yet scored
Current observation
Normal Count
24
normal_count -- The number of propagules in the inventory sample that were counted and displayed normal germination.
Abnormal Count
1
abnormal_count -- Number of propagules in the inventory sample that were counted and displayed abnormal germination.
Advanced
SAVE
CANCEL


Inventory viability
Inventory
IG1 1 SD
Percent Viable
–
Tested Date
6 hours ago
mm/dd/yyyy
Inventory Viability Rule
2x25
Sample Count
50
Replication Count
2
Remaining seeds
0 = 0 + 0
REMOVE
GENERATE LABELS
FINISH TEST
ID
Counting Cooperator
Replication Number
Tested Count
Cou
1 36 Administrator SYSTEM 1 25 11 minutes a
2 35 Administrator SYSTEM 1 25 16 minutes a
3 34 Administrator SYSTEM 1 25 18 minutes a
4 38 Administrator SYSTEM 2 25 6 seconds a
Replication Number 1
Tested Count 25
Count Date 12 minutes ago
Normal Count 1 22 (88%)
Abnormal Count 1 3 (12%)
Unknown Count 1 0 (0%)
Dead Count 1 0 (0%)
Empty Count 1 0 (0%)
Infested Count 1 0 (0%)
Hard Count 1 0 (0%)
Dormant Count 1 0 (0%)
Estimated Dormant Count 1 0 (0%)
Treated Dormant Count 1 0 (0%)
Confirmed Dormant Count 1 0 (0%)
TZ Positive Count 1 0 (0%)
TZ Negative Count 1 0 (0%)
Replication Number 2
Tested Count 25
Count Date 36 seconds ago
Normal Count 2 24 (96%)
Abnormal Count 2 1 (4%)
Unknown Count 2 0 (0%)
Dead Count 2 0 (0%)
Empty Count 2 0 (0%)
Infested Count 2 0 (0%)
Hard Count 2 0 (0%)
Dormant Count 2 0 (0%)
Estimated Dormant Count 2 0 (0%)
Treated Dormant Count 2 0 (0%)
Confirmed Dormant Count 2 0 (0%)
TZ Positive Count 2 0 (0%)
TZ Negative Count 2 0 (0%)
Inventory viability
Inventory
IG1 1 SD
Percent Viable
92
Tested Date
3 minutes ago
mm/dd/yyyy
Vigor Rating
Good vigor
Inventory Viability Rule
2x25
Sample Count
50
Replication Count
2
Percent Normal
92
Percent Abnormal
8
Percent Dead
0
Percent Dormant
0
Percent Empty
0
Percent Hard
0
Percent Infested
0
Percent Unknown
0
Percent Tz Positive
0
Percent Tz Negative
0
Remaining seeds
0 = 0 + 0

Genebank collection management

Introduction to GGCE

Juan Carlos Alarcón

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Genebank operations

Management

Acquisition **Distribution**

Acquisition:

- Collection
- Donation

Management:

- Monitoring (health, quantity, quality)
- Multiplication/Regeneration
- Characterization
- Safety duplication

Distribution:

- Internal
- External: National/International

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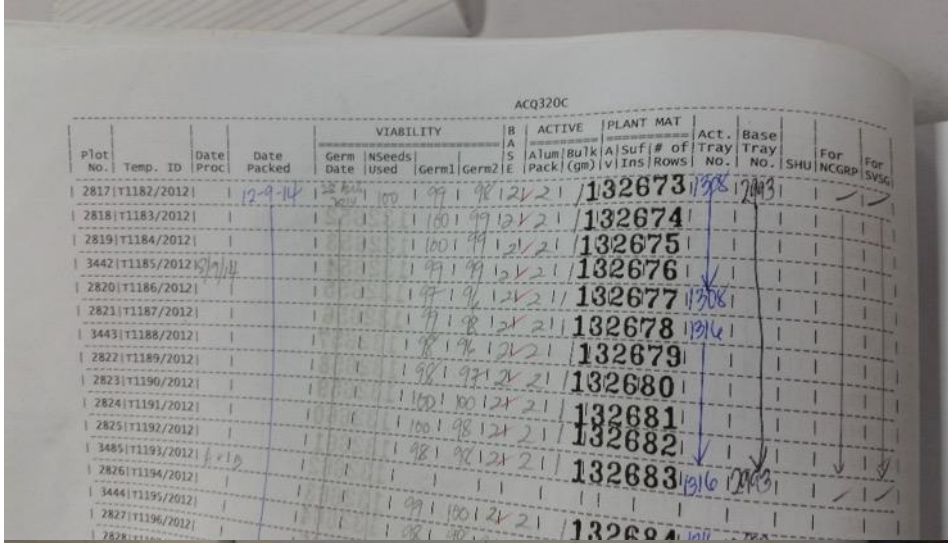
One accession: Many samples

Sample tracking

- Data across operations is linked directly to the specific sample that is being managed
- Every sample in the collection must have a unique identification number



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IT for genebank data and operations

Central genebank database

- Data is in one place
- Data is available to all staff
- Validity: Enforces data constraints
- Security: Access controls
- Safety: Data is backed up

Genebank information system

- Provides support to operations
- Manage and maintain all data about every plant genetic resource in the genebank
- Make available current and accurate data to curators, technicians and users
- Data across all genebank activities are *immediately* recorded
- Assist curators and managers in prioritizing activities

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GRIN-Global

GRIN-Global database is used by many national, regional and international genebanks to house genebank data in a common data format.

- Organized and documented data structures
- Shared (data) vocabulary with other genebanks
- Opportunity to engage with other genebanks in sharing knowledge
- Exchange of experiences and tools for data management

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Introduction to GGCE

- **Manage and maintain data of every plant genetic resource in the genebank collection**
  - Each sample/item in genebank PGR inventory is individually tracked.
- **Assists curators and managers in prioritizing activities**
  - Enable for scheduling and planning of when specific actions will be performed
  - Allows for anticipating periods of high/low activity
  - Avoid future backlogs
- **Make available current and accurate data to curators and technicians**
  - Enable informed decision making

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GGCE Objectives

- **Simple** to access on any device and available in **your language**

Tablets

Personal computers

Cel. phones

Mobile devices

- Supports the use of different **IT gadgets** in genebank operations

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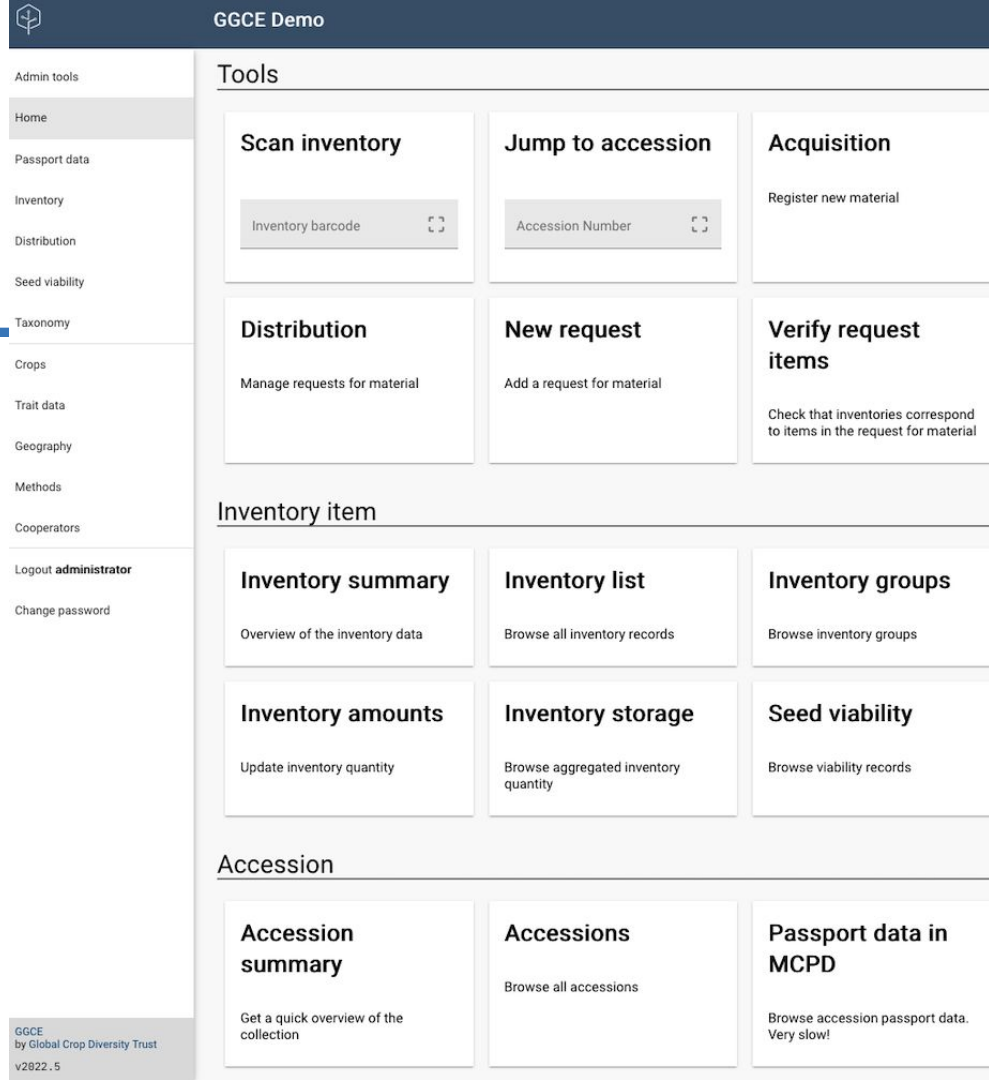
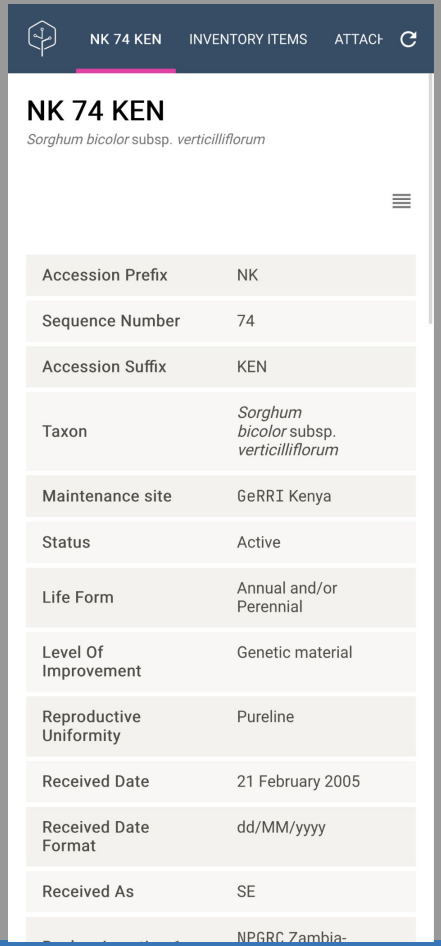
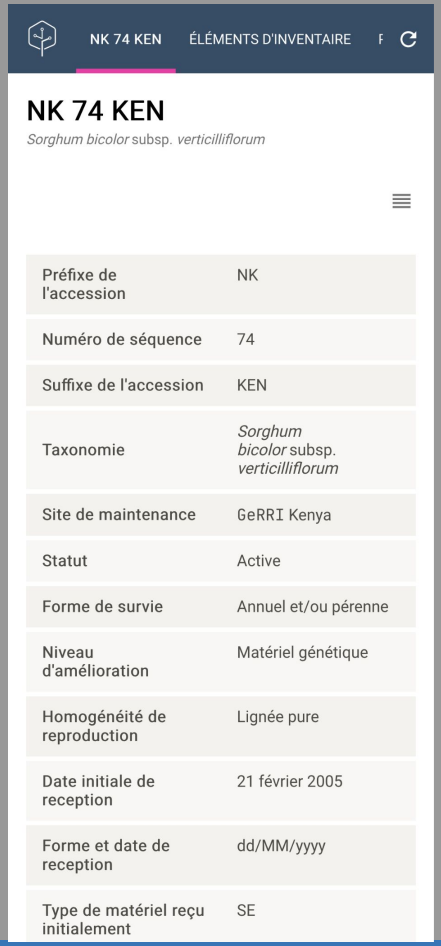
GGCE Mission

- GGCE aims to provide a complete genebank collection management solution.
- GGCE enables genebank staff to **capture and make use of data across all genebank operations.**







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GGCE is available in English, **French**, **Arabic** and other languages

Introduction to GGCE

Why is Crop Trust investing in one **genebank information system?**

- Initial **design and implementation** of an information system requires significant investment
  - Training resources (documentation, user manuals, videos)
  - System hosting and configuration
  - Data migration

- **Maintenance** and **continuous evolution** of an existing system
  - Requires further resources
  - Avoids falling behind current technologies and requiring a new implementation

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GGCE and external systems

- **Assign DOI to genebank material**
  - Integration with Plant Treaty's **DOI Registration Service** to mint DOI for accessions
- **Standard passport data exchange format**
  - Export data in **MCPD**
  - Passport data can be directly uploaded from GGCE to Genesys
- **FAO WIEWS**
  - Retrieve institute information using FAO WIEWS APIs

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www.croptrust.org