Genebank Manual of the LEPL Scientific Research Center of Agriculture Georgia

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1. Germplasm Acquisition and Accessioning

Genebanks can obtain the germplasm they want to conserve in many different ways. Conducting collecting missions is possibly the best way of acquiring germplasm material in the most reliable manner. Germplasm exchange with other genebanks is a third route to add genetic diversity to the collection. Obtaining and storing germplasm from researchers and plant breeders is another route to acquiring genetic material. Such acquisitions should be guided by a formal mandate that the genebank concludes with its host organization or government and that provides the basis for a genebank acquisition policy. The actual accessioning of acquired germplasm samples, i.e. formally including it into the collection with its unique accession number, is a complex process during which the curator has to check many aspects such as the verification of the identity of the material, the health status, the availability of pertinent information, etc. It is further understood that also legal aspects form part of this activity, e.g. was the material collected/obtained in a legal manner, and are there any restrictions on its use.

Box 1.1. Germplasm Acquisition and Accessioning

GA1 — Briefly describe any formal mandate that your genebank might have concluded with or received from your "mother organization" (e.g. institute, governmental body).
This description should include details on:

a) which species you conserve and make available;
b) who decides on what your mandate is and, if different,
c) from whom do you receive the mandate;
d) the main aspects of the mandate; and
e) legal considerations on PGR as foreseen in national legislation.

Field Crop Gene bank is one of the services of the Scientific Research Center of Agriculture (SRCA), the center itself is subordinated to the Ministry of Environment Protection and Agriculture of Georgia (MEPA).
The mandate is to collect, conserve, document, distribute and use plant genetic resources. Genebank nowadays owns collections of annual (cereal, legume) crops- wheat, maize and beans, in the form of a working and base collection. Currently we conserve 846 accessions of wheat, 1473 accessions of bean and 486 accessions of maize.
Concerning legislative acts, the activities of the PGR gene bank are carried out based on the SRCA regulation. (Regulations of the LEPL Agricultural Scientific Research Center https://srca.gov.ge/law)
Specific focus is set on local landraces, endemic species, local breeding material and only PGR material of Georgian origin is introduced in the collection.

Main office of SRCA is in Tbilisi, while the field crop Genebank is in the village Tsilkani, 30 km from Tbilisi, where the seed collection and in vitro facilities are located. A field collection of grapevines, fruit crops and agroforestry crops is located in the village Jighaura.

The in vitro laboratory performs in vitro conservation of: potato, grape, wild grape, CIP (International Potato Center) clone.
In addition, SRCA also owns living collections of grapes, fruit crops, citrus and agroforestry crops (which are not subject to this Manual).

GA2 — Specific agreements. Does your genebank have any specific formal agreements with other gene banks regarding the conservation of specified germplasm?
This should include:

a) whether or not your genebank has any international agreements to conserve specified germplasm on behalf of other countries,
b) specific region, and/or
c) *the world*, and
d) which crops or genepools fall under these agreements?

The Genebank does not have specific agreements with foreign genebanks concerning the conservation of PGR. SRCA, however, conserves accessions of wheat on behalf of the Botanical Garden in Tbilisi.

GA3 — In case your genebank has a germplasm acquisition policy, what does the policy entail?
Please specify which crops or which geographic area, if applicable.

Gene bank does not have a documented acquisition policy. Gene bank has acquired a number of accessions from the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) through an SMTA (STMA # 00AL08), seed material was sent for safety-duplication to Svalbard on 05 February 2025. In total, 50 bean, 60 maize and 100 wheat accessions were sent to Svalbard.
Collection of PGR material is done from collecting missions, local and international gene banks, institutions and private individuals (breeders, farmers).
Collecting missions are based on FAO standards for orthodox seeds, exchange of material with local gene banks and institutes takes place on the basis of local agreements. Materials are received from international gene banks under the Treaty SMTA. Priority is given to local Georgian varieties/landraces, endemic species, also their crop wild relatives. The purpose of germplasm acquisition is research, filling gaps in the collection, prevent genetic erosion and to protect biodiversity.

GA4 – How do you verify the identity of the germplasm material received (e.g. relying on the donor's information, comparing material with other accessions, involving (taxonomic) expertise, etc.)?

Curator of gene bank is responsible for the inclusion of new material in the collection. We verify the identity of the germplasm material received in gene bank:

- Material received from other genebanks - accepting donor's information
- Material collected from natural habitats - representatives of the gene bank conduct the collecting missions and evaluate collected material for species and subspecies with morphological characteristics.
- Materials taken from fields, farmers - we rely on information received from farmers

We grow the material for characterization in the field depending on the research objectives and if the species is new for us.

GA5 – Describe if and how you conduct an assessment of the various quality aspects of the seeds, tissue culture or plant material received.
This description includes:

a) quality aspects related to the correct identification of a given accession, but also
b) health
c) *purity aspects of the sample/accession*, and
d) use of a quality control system (e.g. ISO).

Newly received material is visually inspected by the curators for purity and health status, germination test and moisture control are carried out as needed according to the decision of the curator.

The germination test is carried out if the material is several years old and we suspect that it may have a low germination capacity, and if we need to determine whether there is a sufficient number of seeds for germination.
We evaluate the moisture content when the material is new and we suspect it may have high moisture levels.

GA6 – Describe whether and how the SMTA is being implemented:
a) extent of materials covered by SMTA (crops, numbers of accessions)
b) ways of SMTA implementation and documentation of transfers of PGR
c) other aspects (e.g. monitoring, supervision).

The SMTA has been implemented at the gene bank since 2023. Annex I crop (such as wheat, maize, bean) are distributed under the SMTA. Genetic materials of these crops have so far been received under the Treaty SMTA from the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), USDA-ARS Germplasm Resources Information Network (GRIN) and Centre for Genetic Resources, the Netherlands (CGN), Wageningen. Exchange of material with local gene banks and institutes takes place on the basis of local agreements.

Box 1.2. Germplasm Collecting

GC1 — Describe here the details of the strategy that you follow in implementing germplasm collecting missions.
This description should include:
a) general aspects of planning and implementing a collecting mission,
b) the criteria you use for priority setting;
c) the actual strategy followed in sampling material from farmers' fields, from nature, etc.; and
d) *how your germplasm acquisition policy underpins the mission*.

The decision about planning a collecting mission is made by the curator after s/he has evaluated the collections. The geographical location of the collecting missions is planned following the distribution zones of the species.
The collecting missions are carried out according to the FAO standards for orthodox seeds. On-site curators fill out a questionnaire that includes information about the varieties provided by the farmers, among other important information. Also, they take pictures on the spot. Curators only take material that is visibly healthy and in good physical condition.

GC2 — Provide any additional information on the germplasm collecting activities of your genebank, including the collaboration with others.
N/A

2. *Ensuring* Security

This chapter refers to the security of the gene bank structure itself (i.e., its physical security), the safety of its germplasm (i.e. the maintenance of viability) as well as the institutional and personnel security, aspects which together will ensure the long-term conservation of the entire collection.

2.1. Physical Security

To ensure the physical security of the collections, the following aspects are regarded as essential elements for achieving the objective:

Box 2.1.1. Safety Duplication (of long-term conserved germplasm)

SD1 – Please describe how your gene bank implements the safety duplication of your germplasm material. *This description should include the following aspects:*

a) *the type of safety duplication (e.g. black-box; no specific arrangement; other);*
black-box arrangement with Svalbard
b) the location(s) where you store your safety-duplicates (country; gene bank);
Since February 2025 in the Svalbard Global Seed Vault.
c) whether or not you are using a formal agreement with the gene bank(s) that store your duplicates?
From February 2025 an official agreement was signed with Svalbard Global Seed Vault.
d) whether the safety-duplicates are stored under conditions comparable to your own? Please provide details;
It is known that the conditions at the Svalbard Global Seed Vault are carefully controlled to ensure the seeds remain viable for long periods of time, even in the event of global crises.
We are also confident that our materials will be stored in good conditions in Svalbard Global Seed Vault.
e) do you maintain safety-duplicates from other genebanks at your genebank? If so, do you know any details of that material?
No.

SD2 — Do you have a safety duplication policy? If so, please provide essential details.
No.

Box 2.1.2. Structure

SS1 — Please provide details on how your genebank building has been designed to resist natural disasters (e.g. earthquakes; flood; storm).

The threats to the genebank storage facilities are minimal, as it is located in a moderate climatic region of Georgia which is also a non-earthquake-prone area and a non-flood zone.

SS2 — Please describe the security arrangements that you have in place to protect your genebank against burglars, fire and others.
Please include details on the following arrangements, as applicable:
a. fences;
b. security doors;
c. alarm system;
d. fire detectors;
e. standby generator;
f. *others (please specify*)

The yard of the building is fenced and the territory is protected by a security service. Fire detectors and fire extinguishers are located on both floors of the building.

SS3 – Please provide information on any other structural security aspects that you might have in place.
N/A

Box 2.1.3. Security Equipment

SE1 — Provide details on the kind of emergency (back-up) equipment or arrangements that you have in place to ensure permanent electricity and cooling.
Aspects to consider are:
a. "back-up" compressors for your cold rooms;
b. generator;
c. regular maintenance and trial runs;
d. *other*.
Genebank doesn't have emergency (back-up) equipment to ensure permanent electricity and cooling.

SE2 — Describe how you monitor temperature and relative humidity in your cold stores and drying room?
Control of temperature and relative humidity is carried out by laboratory staff once a day.

Box 2.1.4. Institutional and Personnel Security

IPS1 — Provide details on the "institutional security", in particular with respect to the provision of financial means to operate the genebank.
Aspects to consider are:
a. timely transfer of funds from the "mother" organization to the genebank;
b. do you have direct access to the "mother" organization that provides the budget?
c. internal "security" of accessing these funds;
d. long-term security and stability of funding (compensation of inflation rates, avoiding variation in years)
e. *any other observations that are relevant in this context*.

Genebank is a state institution. It is subordinated to the LEPL Scientific-Research Center of Agriculture, which in turn is subordinated to the Ministry of Environmental Protection and Agriculture of Georgia. The budget of genebank is approved annually. In addition, the genebank receives further financial support through various national and international projects.

IPS2 – Describe how you secure adequate staffing of your genebank.
Most of the employees are employed under a permanent employment contract. The employees of the orthodox seed genebank are: head of genebank, three curators, head of databases, head of laboratory and laboratory assistant.
Four people are employed in the *in vitro* laboratory.
The mentioned positions are filled by staff with the appropriate qualifications and experience, and their number is sufficient to adequately fulfill all tasks of the genebank.

Box 2.1.5. Contingency Plans

CP1 — Describe the kind of emergency or contingency plan that your genebank has in place to cope with disaster situations.
We do not have a particular contingency plan for disasters.

CP2 — Provide information on the kind of training, security drills and other activities that your genebank gives to its staff to deal with emergencies, if any.
Genebank employees are periodically trained on the rules of behavior in emergency situations and safe work at the workplace. This includes how to respond to fires, natural disasters, or other emergencies to protect both personnel and genetic materials.

3. Germplasm Maintenance

This chapter deals with key aspects of managing germplasm in a genebank, i.e. the maintenance of the viability, the genetic integrity, the availability of the conserved germplasm as well as the management of the corresponding information.

N.B. Sections on Cryopreserved collections and Field genebanks are not applicable for SRCA, therefore these sections have been removed from the document.

3.1. Maintenance of Viability

This section refers to the maintenance of the longevity of the seeds or of tissue cultures or living plants in storage. A high initial viability is the most important pre-condition for achieving the longest lifespan of seed accessions in storage, hence maximum efforts need to be taken to ensure that seeds to be stored have the highest possible viability. Optimum growing conditions when multiplying/regenerating the accessions, efficient management of the preparatory steps before storing the germplasm, adequate storage conditions as well as proper monitoring of the viability are critically important.

A. Seed Collections

Box 3.1.1.A. Initial seed viability

IV1 — Describe the procedures or practices that you have in place to ensure the highest possible initial viability of your seed, in particular during regeneration and post-harvest (e.g. cultivation practices, pollination aspects, use of specific equipment as shelters, storage of harvested seeds, cleaning, etc.).
Assessment of initial seed viability is not done in our genebank.

IV2 — Describe procedures how you deal with a) dormancy and b) hard seeds?
N/A

IV3 — Please provide any other information on procedures that you follow to ensure the highest possible initial viability.
N/A

Box 3.1.2.A. Seed Viability Monitoring

VM1 — Describe the routine seed viability monitoring system that you use.
The monitoring system should include the following aspects:
a) frequency of testing;
b) sampling method applied;
c) any thresholds that you use;
d) whether you apply different procedures for crops/species with erratic initial viability or irregular viability lifespan;
e) *etc.*
Seed viability monitoring is not done in our genebank.

VM2 — Please describe the information "system" that you might have in place that allows you to make more species or even accession-specific decisions when the next monitoring should take place.
N/A

VM3 — Please provide information on non-specific thresholds that you might use for the viability of seeds (i.e. a percentage of germination) and for the number of seeds left of accession to initiate regeneration. *In case you differentiate between self- and outbreeding species, please answer for each category separately.*
N/A

Box 3.1.3.A. Seed Storage Conditions (for the different types of collections, i.e. short/medium- or long-term storage)

SC1 – Please provide details on temperature and relative humidity conditions of your storage and drying rooms. In case they vary from room to room, please provide details for each.
After the sample arrives at the gene bank, it is cleaned, dried at ambient humidity and 14-16°C and then stored. The exception is samples with high humidity, in which case they are dried at room temperature and ambient humidity. The gene bank does not have a separate drying process due to the lack of appropriate equipment and space.
We also dry samples with using silica gel.

SC2 — Provide details on the type of containers and the packaging procedures (and the corresponding equipment, if any) that you use.
The range of seed moisture content varies between 12-14%. for working collection, all samples are stored at a temperature of 14-16 °C. and about 60% humidity. Studies have established that under these conditions the moisture content of seeds reaches 12-14%.
We have placed most of the samples in non-hermetic packages and they reach the specified moisture content level in about 2-3 weeks.
For the base collection, seeds are stored at -18 °C and containers are aluminum

SC3 — What is the range of seed moisture contents (smc) of your stored seeds of different species; what measures do you apply to keep and/or monitor the (low) moisture level? Do you treat different species differently?

Genebank started preparation of long-term conservation, The range of seed moisture content varies between 9-14%. All samples are stored at a temperature of 14-16 degrees and about 60% humidity. We have placed most of the samples in non-hermetic packages and they reach the specified moisture content level in about 2-3 weeks.

SC4 — Provide data on the total storage capacity (number of containers, number of accessions) and an estimated percentage to which extent this capacity has been filled.

At this stage, the space is completely used. In total, 2831 accessions are stored in the Genbank. Of these, maize is 486, wheat - 825 (Added one sample of Aegilops), Beans - 1520.

The genebank has 2 rooms for storing samples. In one of these rooms there are refrigerators for storing samples:

2 refrigerators (+2-8°C for active collections of seed material);

2 refrigerators (-18-22°C for the base collection)

SC5 — Please include any other aspects regarding storage conditions at your genebank that you regard as important (e.g. anticipated lifespan of freezing and drying equipment and related prudent financial management)

None.

B. *In vitro* Culture Collections

Box 3.1.1.B. Initial viability

IV1 — Describe the procedures or practices that you have in place to ensure the highest possible initial viability of your plant material, in particular during culture of donor plants (e.g. cultivation practices [field, greenhouse], phytosanitary pre- treatments, like use of pesticides).

In the case of grape, we collect materials from the field during two seasons. The first period is from January to the end of February when the plants are dormant. During this time, we harvest scions, which begin to sprout in a controlled environment where we regulate the physical parameters for their growth. We find this method more successful because shoots are less likely to become contaminated compared to those harvested directly from the field. The second collection period is in spring, when new shoots are just beginning to emerge, and buds have recently opened.

Initial materials are collected, washed, and placed under regulated conditions to initiate vegetation. Although they are already treated with fungicides (fungicide treatments typically occur during spring vegetation in the field against various fungi, such as Plasmopara viticola and others), additional surface washing is conducted when the plants are brought into the laboratory. Some plants, grown in the open field or screenhouses at Jighaura (Jighaura is a village where SRCA has another site for the fruit and grape crops), have undergone RT-PCR and ELISA testing, providing partial assurance of their phytosanitary status. For materials with uncertain status, thermotherapy is initiated, and the standard protocol is followed. We follow protocols from EPPO (European and Mediterranean Plant Protection Organization), as well as protocols published in scientific papers. In some cases, the process varies: propagation is carried out first, and thermotherapy is applied once the plant exhibits visible growth.

Plant health control continues throughout the year. If a plantlet shows symptoms of fungal infection, we carry out sterilization using different types of hypochlorite and TWEEN.

IV2 — Describe procedures of explant isolation (organ source in the plant, manipulations) and sterilization (chemical and handling) of the explants.

Propagation primarily involves the use of shoot tips, apical meristems, leaf apexes, and root apexes. Among these, the apical meristem method is the most widely used and preferred approach. Surface sterilization is conducted using sodium hypochlorite (NaOCl), 70% ethanol, and Tween. The exposure duration and concentrations are adjusted based on the developmental stage of the plant material. Conditions are the same for all species.

IV3 — Please provide any other information on procedures that you follow to ensure highest possible initial viability.

As a source for explants, only healthy material is used. Laboratory is checked every day, temperature is sufficient for initial stage to grow. If we want to promote callus formation, photoperiodism is altered. After survival, plants are sent to medium where rhizogenesis happens. With usage of plant growth regulators rhizogenesis and elongation can be successful.

Box 3.1.2.B. Viability Monitoring

VM1 — Describe the routine *in vitro* viability monitoring system that you use.

The monitoring system should include the following aspects:

a) regular control of contamination events,
b) control of hyper-hydricity,
c) control of health state (if different from a above),
d) *etc.*

We check every tube and container to see visible symptoms of fungi contamination; parameters of laboratory, like humidity, photoperiodism, temperature, if light bulbs are working well, air conditioning; We check vitrification- if plants are green or they show symptoms of losing colors, in the case of grapevine, we observe root formation due to the research reasons. We control number of contamination and number of propagated material, which is written in a special journal.

VM2 — Describe the information "system" (i.e. an "expert system") that you might have in place that allows you to make more species or even accession-specific decisions when the next monitoring should take place.

No specific system is being implemented. The experience and skills of the technical staff are crucial for specific decisions.

VM3 — Please provide information on non-specific thresholds that you might use for vigour of *in vitro* cultures (i.e. multiplication rates, loss by weak growth) and for the amount of culture vessels (tubes, jars) left of an accession to initiate additional multiplication measures.

Decisions on multiplication regimes are taken under the personal experience of the responsible staff members.

Box 3.1.3.B. Storage Conditions (for the different types of collections i.e. short/medium- or long-term storage)

SC1 — Please provide details on light, temperature and relative humidity conditions of your culture and storage rooms, as applicable. In case they vary from room to room, please provide details for each.

Photoperiodism 16/8; Humidity around 70%, Light intensity-3000 lux, temperature-18-20oC.

SC2 — Provide details on the type of cultivation vessels (tubes, jars plastic vessels etc.) and the transfer

procedures (including the corresponding equipment, if any) that you use.
During propagation, we use tubes, plastic vessels, and glass jars, with the choice of vessels depending on the specific requirements of the culture and the desired growth size. Prior to introducing plant material or culture medium, all vessels are autoclaved. They are opened under aseptic conditions in a laminar flow cabinet, where sterilized plants are transferred. In some cases, parafilm is used to seal the vessels before transferring all jars and tubes to the phytotron (culture room) with controlled environmental conditions. Each cultivation vessel varies in size and height, allowing plants to adapt and modify their growth accordingly.

SC3 — Please include any other aspects regarding *in vitro* culture and storage conditions at your genebank that you regard as important.
We continuously monitor temperature to maintain optimal conditions. For the germplasm refrigerator, we aim to keep the temperature between 4–6°C. In the culture room, used for storage and growth, we regulate the temperature to remain between 18–20°C. Additionally, UV light is periodically used to ensure environmental cleanliness.

3.2. Maintaining Genetic Integrity

Maintaining the genetic integrity of an accession can be achieved by minimizing genetic drift which may occur predominantly during the process of regeneration, due to too small numbers of individuals being planted, sub-optimal pollination and/or the introgression of alleles from other accessions or commercial crops or crop wild relatives. The following aspects are important for achieving the objectives of maintaining genetic integrity and should be briefly described. Please note that a distinction should be made between seed numbers for an accession and seed numbers for sub-samples per accession. The latter only applies if the seeds of a given accession are being stored and distributed as sub-samples. As genetically modified materials get more widely distributed and as they might have specific (legal, technical, administrative) requirements a separate box for this type of material is included.
For *in vitro* cultured and cryopreserved material, which are normally maintained as clones, genetic stability is as important as genetic integrity of the seed-stored material.

A. Seed Collections

Box 3.2.1.A. Seed Containers and Sample Size

SCSS1 — Do you document the initial number of seeds of individual accessions (either as received from collecting missions or through exchange)?
The sample weight is recorded for each accession. If the grains are large, then counting is also possible.

SCSS2 — Please describe what kind of containers (and equipment) you use, the procedure you follow with respect to sub-sampling, seed numbers per container, etc.
We do not do sub-sampling.

SCSS3 — What is the number of seeds that you use as the minimum threshold per accession? Are these seed numbers of a given accession based on genetic parameters (such as reproduction biology; heterogeneous samples)? Please provide URL of your protocols if these are available online.
We do not have defined the minimum number of seeds for per accession.

SCSS4 — Please provide details on other aspects that are important in this context.
N/A

Box 3.2.2.A. Pollination Control

PC1 — Please describe the regeneration procedures that you follow for self- and outbreeding species.
Please include in your description the following aspects:

a. any control measures to minimize or avoid cross-pollination between accessions;
b. the use of pollination cages for insect-pollinated species;
c. the use of specific pollinators for insect-pollinated species;
d. *strategies to ensure that males and females participate equally in the reproduction*).
e. *strategies to avoid any genetic drift (minimum number of plants, minimum number of plants at flowering stage before pollinators introduction, similar quantity of seeds harvested from each plant, etc.)*

Since maize is a cross-pollinated crop, it requires pollination control. In order to prevent cross-pollination between samples, we use isolation bags.
During sample propagation, typical plants are selected and both the ear and tassel are isolated separately. The isolation bags are removed when the tassel starts to flower. The isolation of the ear is done before hairs appear from the ear. In artificial propagation, the pollen of one plant must be transferred to the ear of another plant when the ear is ready for pollination.
This process continues until each flowering plant has been used. Pollinated ear remains in the isolator until the end of vegetation.

PC2 – Provide any other relevant information on procedures that you apply to control pollination of your germplasm
N/A

Box 3.2.3.A. Regeneration Environment and Procedures

RE1 — Describe the regeneration environment and conditions that you apply. If applicable, you might want to distinguish between different types of germplasm (e.g. wild relatives, landraces, modern varieties, breeding material, genetic stocks, etc.). *Consider the following aspects:*

a. In how far are the environmental conditions of the current regeneration of individual germplasm accessions comparable to the environmental conditions that existed at the original collecting or breeding site?

Regeneration is carried out in the fields of gene bank. Most accessions are well adapted to the local natural conditions.

b. do you use controlled environments?

There is no controlled environment

c. do you collaborate with other gene banks in Europe?

There is no collaboration on regeneration of accessions with other gene banks in Europe

d. *Others*

N/A

RE2 – Please include any other relevant points on regeneration environment.
N/A

Box 3.2.4.A. Seed Processing Procedures

SPP1 — Describe the protocol(s) that you use for threshing and seed cleaning.
The curator cleans the genetic material received in the genebank using the appropriate method, as needed

- manually and/or with sifter. We have written a standard operating procedure for this process.

SPP2 — Describe the protocol(s) that you use for seed drying, including whether you use different drying procedures for different types of species.
There is no separate drying process in the genebank due to lack of appropriate equipment and space. In exceptional cases, in the case of a sample with high humidity, the sample is first dried at room temperature and atmospheric humidity and then stored.

SPP3 — Please describe how you keep the time between harvesting and the actual (long-term) storage of seeds as short as possible.
The time between harvesting and final storage should be as short as possible. The seeds are placed for storage immediately after pre-drying and cleaning. This process takes approximately one day to one week depending on the amount of material.

SPP4 — Please describe how and where you store (in a temporary manner) newly harvested seeds.
Please provide details on the temperature and relative humidity of the storage room/space; what type of containers do you use, if any.
Newly harvested seeds are temporarily stored in a warm and low humidity room. (About 2-3 weeks at 20-22°C and 35-40% humidity). The room is treated with pesticides to protect material from pests.

SPP5 — Describe the criteria you use to decide on seed quantity per accession for the long-term storage.
Seed quantity per accessions based on demand

Box 3.2.5.A. Genetically Modified Material

GMM1 – In case you treat GMO material differently from "normal germplasm", please provide here the details for each of the deviating procedures (and equipment).
There are no GMOs preserved by our genebank.

GMM2 — Describe the policy and procedures (if any) in your genebank, related to ensuring that distributed samples are not containing GMOs.
N/A

B. *In vitro* Culture Collections

Box 3.2.1.B. *In vitro* Culture Vessels and Sample Size

SCSS1 — Indicate if you document the initial number of explants of individual accessions when culture is initiated (from one or from more clonal donor plants).

They are indicated in a hard copy journal; The process is managed by the laboratory workers. Each time we propagate plants, we record the number of propagated plants in the journal. Next to the entry, each worker signs for authentication. The journal is then stored in the laboratory and monitored by the head of the department to ensure that all processes are documented daily.

SCSS2 — Please describe in general terms the type of culture vessels (as far not already done in section SC2 in Box 3.1.3.B), media and phytohormones you use as well as the procedures you follow with respect to cutting technique, callus exclusion, etc.

We primarily use Pyrex tubes made of borosilicate glass, as they are highly resistant to temperature and chemical exposure. The media we use is mostly sourced from Duchefa and includes MS and WPM formulations. The phytohormones we commonly use are NAA, IBA, and IAA. Occasionally, we also prepare PGR-free media. For propagation, we follow various protocols, including shoot meristem cutting and callus culture.

SCSS3 — Please indicate whether or not you use a minimum number of *in vitro* plantlets per accession.
Per accession, for *Vitis* we do not have minimum number; For potato, for each clone we have around 40 mother plants saved as an initial material. There are some clones which are propagated more intensely than others, but there are not any special requirements or rules regarding the minimum number per accession.

SCSS4 — Please provide details on other aspects that are important in this context.
N/A

Box 3.2.2.B. *In vitro* Culture Procedures

SPP1 — Describe the numbers of sub-clones you may cultivate per accession (assuming that this is not crop-specific).
Sub-clones for each accession are at least 3 for most of the plants; For grapevine, can be 1 or more. The number of sub-clones is crop-specific.
We try to maintain at least some material for the further research, for example to try subcultivation with different methods, or to expose some green plants to thermotherapy and check their survival rate. In case of potatoes if we check how some clones are handling biotic or abiotic stress, we propagate numbers of sub clones more intensively. From one potato clone in the tube, we get at least 3 subclones. For each clone sometimes hundreds of subclones are made. All mother materials are maintained.

SPP2 — Describe the sub-culture duration (if not crop-specific).
For potatoes, 2-3 weeks are sufficient for the next subcultivation, while for grapevines, it typically takes more than one month, depending on the variety.

SPP3 — Describe the criteria you use to decide on *in vitro* plant quality (if not crop- specific).
Shoot and root size, color of the leaf, phytosanitary status, no symptoms of vitrification.

3.3. Ensuring Availability

An important objective of conservation efforts is to facilitate the effective utilization of germplasm accessions by researchers, breeders and farmers. Thus, ensuring the ready availability of stored germplasm is an important principle. It refers to the ability of genebanks to supply and distribute the stored germplasm, together with any associated information, in an adequate way to users. Aspects that can affect the availability include: (a) policies, (b) seed stock, (c) health status of accessions, and (d) distribution quantity.

A. Seed Collections

Box 3.3.1.A. Ensuring Availability of Germplasm – Policy Aspects

AGP1 – Describe the germplasm distribution policy that you follow at your genebank.

You might want to consider in your response the following aspects:

a. *crop/species specificity;*
b. *whether or not sufficient seed stock is available;*
c. *who the requestor is; what the purpose of the germplasm request is;*
d. *any restrictive conditions and/or*
e. *the total amount of accessions sent per request for distribution of germplasm;*
f. *use of a formal agreement to distribute the germplasm*.

After receiving a request for distribution, the curators determine if they have resources for distributing the material.
We send seeds for breeding, research or education purposes. The total amount of accessions sent per request for distribution of germplasm isn't defined. In our genebank Annex I crops are distributed under the SMTA. Exchange of material with local genebanks and institutes takes place on the basis of local agreement. *In vitro* cultures are not distributed.

AGP2 — Do you have as part of your service-rendering policy aspects such as a "maximum time" between receiving a germplasm request and distribution of the germplasm?

There is no special service-rendering policy applied. Orders are fulfilled and germplasm is distributed in the shortest possible time.

AGP3 — Describe how you treat "related information" about the requested accessions that you make available to the requestor, i.e. provide details on the typical information you send out with the germplasm.

The requestor receives germplasm with basic information such as: institute code, accession number, full scientific name, country of collection, biological status, accession name, year of harvest and regeneration. If necessary, we also provide the requestor with additional information requested by them.
We deliver information electronical and included in the material.

Box 3.3.2.A. Ensuring Availability of Germplasm – Seed/Germplasm Stock Aspects

AGSS1 – Please provide details on the minimum/maximum amount of seed, plants, *in vitro* samples that you distribute (where relevant, differentiated by species groups, i.e. self-pollinating, cross-pollinating and/or whether an accession is homo- or heterogeneous).

In the case of seeds, minimum/maximum amount of seed isn't defined. After receiving a request for distribution, the curators determine if they have resources for distributing the material. *In vitro* samples are not distributed.
We don't have differentiated distribution policy for cross-pollinating and self-pollinating species.

AGSS2 — Describe how you store the seeds/etc. of a given accession with respect to the use of single or multiple bags or containers per accession.

The samples entered in the genebank are generally small in number, so they are placed in one container. The seeds obtained after regeneration are stored in a separate container. Also, harvests from different years are stored separately.

AGSS3 — Describe how you manage the availability of adequate seed/other germplasm stock per accession, including the use of an absolute lower minimum of seeds per accession as the threshold to decide to regenerate.

We do not have defined an absolute lower minimum of seeds per accession as the threshold to decide to regenerate.

AGSS4 — Provide here information on any other aspects that are relevant to managing seed/other germplasm stocks.
N/A

Box 3.3.3.A. Ensuring Availability of Germplasm – Health Aspects

AGHA1 — Describe how you store seed/other germplasm with respect to germplasm health considerations, including whether you have a "policy" of storing only "disease- free" (as far as you can see or determine) accessions, at least for the quarantine pests and diseases.

No crop-specific tests are carried out. Disease and pest-free seeds are preserved. Inspection is carried out by visual assessment. The curator chooses such seeds that are not visually damaged, there are no traces of insects and fungus on the surface.

AGHA2 — Describe how you follow plant quarantine rules and regulations when exporting germplasm abroad (especially to countries on another continent).

Seeds are distributed with a phytosanitary certificate and/or other documentation required by the requestor.

AGHA3 — Describe if and how you distribute germplasm accompanied by a phytosanitary certificate or a "plant passport".

In Georgia phytosanitary certificate is provided by the National Food Agency (NFA). In the case of sending genetic material out of the country, the NFA visits the genebank and inspects the material upon the request of genebank.

AGHA4 — Provide any other relevant information on procedures that you follow with respect to germplasm health aspects.
N/A

Box 3.3.4.A. Germplasm Supply

GS1 — Describe the policy of your genebank with respect to the sample size that you use for distribution purposes, including whether you differentiate between germplasm from self- or outbreeding species, heterogeneous accessions, and possibly other aspects.
See Box 3.3.2A

GS2 — As GS1 above, but in case your germplasm samples do not possess the minimum viability, would you increase the number of seeds?
Yes, if we have enough seeds available.

GS3 – Please provide information on any other aspects related to seed supply.
N/A

B. *In vitro* Culture Collections

Box 3.3.1.B. Ensuring Availability of Germplasm – Policy Aspects

AGP1 — Describe the germplasm distribution policy that you follow at your genebank. *You might want to consider in your response the following aspects: is the user informed about the option to get provided with* in vitro *cultures and whether they are available all the time of the year, are* in vitro *samples an option or the only way to get material; who the requestor is; what the purpose of the germplasm request is; any restrictive conditions and/or the total amount of accessions sent per request for distribution of germplasm; use of a formal agreement to distribute the germplasm.*
In vitro samples are not distributed.

AGP2 — Indicate if you have as part of your service-rendering policy aspects such as a "regular or a maximum time" between receiving a germplasm request and distribution of the germplasm?
N/A

AGP3 — Describe how you treat "related information" about the requested accessions that you make available to the requestor, i.e. provide details on the typical information you send out with the germplasm
N/A

Box 3.3.2.B. Ensuring Availability of Germplasm – Germplasm Stock Aspects

AGSS1 — Please provide details on the maximum amount of *in vitro* samples that you distribute.
N/A

AGSS2 — Describe how you store the samples of a given accession with respect to the use of vessels for culture and vessels for distributions (glasses of plastic bags).
N/A

AGSS3 — Describe how you manage the availability of adequate plants per accession, including the use of an absolute lowest minimum of plants per accession as the threshold to decide to regenerate.
N/A

AGSS4 – Provide here information on any other aspects that are relevant to manage stocks (e.g. transfer of material through greenhouse transfer phases in case a user cannot handle *in vitro* cultures).
N/A

Box 3.3.3.B. Ensuring Availability of Germplasm – Health Aspects

AGHA1 — Describe how you store germplasm with respect to germplasm health considerations, including whether you have a "policy" of storing only "disease-free" (as far as you can see or determine) accessions,

at least for the quarantine pests and diseases.
N/A

AGHA2 — Describe how you follow plant quarantine rules and regulations when exporting germplasm abroad (especially to countries on another continent).
N/A

AGHA3 — Describe if and how you distribute germplasm accompanied by a phytosanitary certificate or a "plant passport".
N/A

AGHA4 – Provide any other relevant information on procedures that you follow with respect to germplasm health aspects.
N/A

Box 3.3.4.B. Germplasm Supply

GS1 – Describe the policy of your genebank with respect to the sample size that you use for distribution purposes.
N/A

GS2 – Please provide details of your routine methodology of containers etc. that you use to distribute *in vitro* cultures.
N/A

GS3 — Please provide information on any other aspects related to *in vitro* plant supply.
N/A

4. Providing Information

The lack of adequate information on a given accession may well decrease the value of that accession to the user. The information on individual accessions should be as complete as possible in order to facilitate the identification of duplicates and/or to select accessions with desirable characteristics. A genebank should have a documentation system in place that allows to optimize management of the collections as well as to provide access to information about the collection to users.

Box 4.1. Genebank Documentation System

GD1 — Please provide details on the technical aspects of the genebank information management system(s) that you use.

a. On which software is the system based (i.e. Oracle, Fox Pro, MS Access, MS excel, MS Word, other?).
b. In case you use a manual information management system, please provide details.
c. In case your "internal" database(s) is/are different from the publicly available database(s), please provide details on both,
d. Describe which activities of the genebank are covered by the system.

Information on seeds in the genebank is gathered in a database based on MS Access. We do not have such a database on *in vitro* collections yet.

GD2 — Provide details on which types of data you handle in your documentation system, e.g. passport data, characterization & evaluation data, cultivar data, material distribution etc.
Passport data and the process of characterization is started.

GD3 — In case your internal database(s) is/are different from the publicly available database(s), please provide details on both.
We are currently setting up an internal database of the material conserved at the genebank. It is based on the EURISCO features and MCPDs and is expected to be running and publicly available by the end of 2025.

GD4 — Describe in which form you send accession-specific data (e.g. as hard copy, electronically — if the latter, please specify (in plain text) which file format, i.e. Excel, Access, others is used).
Information is sent electronically. PGR database is created in Access program, PGR dataset to Svalbard is sent in excel form.

GD5 — Provide information on how technical support for development and maintenance of the documentation system is arranged.
N/A

GD6 – Describe your genebank policy with respect to backing-up of the database contents, including with which frequency?
The head of the orthodox genebank makes backup copies once a week.

GD7 — Provide any other information on your information management system that is not covered in one of the above questions.
N/A

Box 4.2. Information Exchange

IE1 — Please describe how you make your passport data available to users (i.e. as hard copy; via the internet; other?).
So far only available to curators and people working in the genebank.

IE2 — Please indicate if your data is available as machine-to-machine web- services. In case it is, describe
a. what types of data (passport data, characterization & evaluation data etc) and
b. which web-service interfaces are available (i.e. GBIF IPT, BioCase, TapirLink).
N/A

IE3 — Please indicate if your data is published to EURISCO. Describe which data is published to EURISCO and at which intervals.
Not yet

IE4 — Please provide any other information on information exchange that is important for others to know.
N/A

IE5 — Describe the kind of information you distribute together with the germplasm to persons that request germplasm?
Please consider the following data types: Passport, Characterization; Evaluation, and/or Germplasm management data (e.g. viability percentage; protocols followed for routine operations; etc.
Passport data; Available characterization and evaluation are provided upon request.