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Agroscope

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Operational Genebank Manual

Of the Swiss National Genebank Agroscope

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1 Germplasm Acquisition and Accessioning

Genebanks can obtain the germplasm they want to conserve through a number of 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 acquire 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 a number of 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 legal manner, are there any restrictions on its use, etc.

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;

The Swiss national genebank conserves and provides access to a diverse collection of crops, including: 6,852 accessions of wheat, 2,284 of spelt, 1,461 of triticale, 866 of barley, 169 of durum wheat, 82 of emmer wheat, 38 of Poulard wheat, 17 of einkorn wheat, 20 of club wheat, 37 of Aegilops, and 53 from other Triticum species. Additionally, the collection includes 429 accessions of maize, 896 of vegetables, 54 of soybeans, 87 of buckwheat, 48 of poppy, 50 of faba beans, and several other industrial plants. In total, the genebank holds 14,031 accessions.

b) who decides on what your mandate is and, if different,

The National Genebank is part of AGROSCOPE, the Swiss center of excellence for agricultural research, and is affiliated with the Federal Office for Agriculture (FOAG), with its facility located in Nyon. In addition to its research functions, Agroscope also performs enforcement duties in accordance with legal mandates, providing support to FOAG through the development of enforcement tools. One such responsibility includes the operation and management of the national genebank.

c) from whom do you received the mandate;
From the Research Station Agroscope (Institute)
d) the main aspects of the mandate; and
e) legal considerations on PGR as foreseen in national legislation).

d) and e)

The conservation and sustainable use of plant genetic resources for food and agriculture is regulated by Ordinance 916.181, dated October 28, 2015 (with the current version effective as of January 1, 2018).

Article 3 specifically addresses the operation of the National Genebank:

Art. 3 National Genebank PGREL

a. The Federal Office for Agriculture (FOAG) is responsible for maintaining the National Genebank PGREL, which is dedicated to the conservation and sustainable use of plant genetic resources. This includes genebanks, conservation collections, and areas for in situ conservation.
b. The FOAG may delegate the management and maintenance of genebanks, conservation collections, and in situ conservation areas to third parties, provided they can ensure the long-term conservation of the plant genetic resources.

GA2 – Specific agreements. Does your genebank have any specific formal agreements with other genebanks regarding the conservation of specified germplasm?
(*This should include:*

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

No, specific agreements.

GA3 -In case your genebank has a germplasm acquisition policy, what does the policy entail?.

j) please specify which crops or which geographic area, if applicable.

Ordinance 916.181, dated October 28, 2015 (with the current version effective as of January 1, 2018), outlines in Article 4 the criteria for including new material in the National Genebank:

Art. 4 Inclusion in the National PGREL Genebank

a. The following plant genetic resources for food and agriculture (PGREL) shall, in particular, be included in the National PGREL Genebank: a. Varieties and landraces developed or bred in Switzerland; b. Varieties, landraces, or genotypes that have held national, regional, or local importance in the past.
b. PGREL shall only be included in the National PGREL Genebank if: a. They can be made available to third parties in accordance with Article 5; b. They are not protected by intellectual property rights.
c. PGREL owned by natural or legal persons may also be included in the National PGREL Genebank, provided the owners agree to make them available within the Multilateral System.

In Article 5 is the access to the material regulated.

We also include breeder lines, accessions utilized in Agroscope's wheat breeding program, as well as modern varieties developed by Agroscope.

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.)?

We rely both on the reports and studies provided by our partners and on Agroscope's multi-year field observations of wheat breeding lines.

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:*

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

k) The correct identification of an accession relies on information provided by suppliers (passport data) and a visual assessment to verify that the seeds correspond to the appropriate botanical species.

l), m), n) For vegetable accessions, a third party inspects the regeneration process in the field. The seeds are then sent to the Agroscope seed testing laboratory, which is accredited by the International Seed Testing Association (ISTA), for purity and germination testing. Only seeds with sufficiently high germination rates are accepted into the genebank.

Upon arrival at the genebank, a visual inspection of the seeds is performed.

For cereals and soybeans, germination tests are conducted by the genebank itself.

GA6 – Describe whether and how the SMTA is being implemented

o) Extent of materials covered by SMTA (crops, numbers of accessions)
p) Ways of SMTA implementation and documentation of transfers of PGR
q) *Other aspects (e.g. monitoring, supervision)*

The SMTA (Standard Material Transfer Agreement) has been in effect since December 2007, and all accessions, including non-Annex 1 crops, are provided under SMTA regulations.

Access to the genebank is further governed by Ordinance 916.181, dated October 28, 2015 (with the current version effective as of January 1, 2018):

Art. 5 Access to the National PGREL Genebank and Benefit-Sharing

> Material from the National PGREL Genebank shall be made available for research, breeding, development, or the production of basic propagating material for the agriculture and food industries, provided a Standard Material Transfer Agreement (SMTA) under the Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of November 3, 2001, is concluded for this purpose.
>
> If the material is to be used for purposes outside the scope of the SMTA, the Federal Office for Agriculture (FOAG) will set access conditions, considering any financial or other benefits arising from the use of the material.
>
> The FOAG will use benefits derived from these agreements for the conservation and sustainable use of PGREL.

The SMTA agreement can be viewed at: www.planttreaty.org/content/what-smta (version dated June 16, 2006).

Genebank material can be ordered at: www.pgrel.admin.ch with an SMTA. All SMTAs are promptly transmitted to the International Treaty on Plant Genetic Resources for Food and Agriculture (https://mls.planttreaty.org).

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*).

There are no specific missions for crop collection. However, when local or old Swiss varieties are identified, they are included in the Genebank. This often occurs through chance discoveries, including materials from other genebanks, and we maintain regular contact with NGOs in Switzerland to facilitate this process.

SE2 – Provide any additional information on the germplasm collecting activities of your genebank, including the collaboration with others.

2 Ensuring Security

This chapter refers to the security of the genebank 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 genebank 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.

b) *The location(s) where you store your safety duplicates (country; genebank);*
Safety duplicates are stored in the Global Seed Vault in Svalbard. For seeds with reduced longevity, such as beans, duplicates are kept at the Botanical Garden in Geneva (Conservatoire et Jardin Botaniques de la Ville de Genève).

c) *Whether or not you are using a formal agreement with the genebank(s) that store your duplicates?*
Yes, there is a formal agreement with the Global Seed Vault and Switzerland, but no formal agreement with the Botanical Garden of Geneva, there is only an oral agreement.

d) *Whether the safety duplicates are stored under conditions comparable to your own? Please provide details;*
Yes, the seeds are also stored at –18°C.

e) *Do you maintain safety duplicates from other genebanks at your genebank? If so, do you know any details of that material?*)
Yes, we have safety duplicates from ICARDA, 1270 Lathyrus samples with a list of with passport and evaluation data.

SD2 – Do have a safety duplication policy? If so, please provide essential details.

There is a Memorandum of understanding between ICARDA and Agroscope established in May 1996. Both centers agreed that the accessions will be kept in the long-term storage facilities of Agroscope with a temperature of at least -15°C. ICARDA will pack the seeds in evacuated aluminum foil containers at a seed moisture content below 8% to retain maximum longevity in storage. ICARDA will provide to Agroscope a print-out of the passport information on all accession duplicated. It was also agreed, that the accessions received will not be distributed to third parties by Agroscope.

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).

Switzerland is not situated in a high-risk earthquake zone. Compared to the rest of Europe, the country's exposure to earthquakes is moderate. Additionally, Switzerland is not significantly exposed to high winds or storms. The country's building and infrastructure standards are notably high by international comparisons, ensuring robust resilience to such natural events.

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*).

There are no fences, but the doors of the building are closed in the night.
The freezer is secured with a lock and features an alarm system for temperature deviations in the cold storage units. Fire detectors are installed throughout the building. Two backup generators are available for cooling, each capable of maintaining the temperature at -18°C. In the event of a blackout, the insulation is designed to ensure that the temperature rises very slowly. The standby generator will automatically activate if a power outage occurs.

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

Access and admission of authorized staff only.

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*).

A system of alarm for temperature deviations in cold stores exists; backup generator is in place and will automatically kick in in case of blackouts; regular maintenance and trial. See SS2.

SE2 – Describe how you monitor temperature and relative humidity in your cold stores and drying room?

The freezer is equipped with an automatically controlled electronic alarm system, which triggers the backup generators if the freezer's motor fails, ensuring continuous operation. Additionally, an alert is sent to Agroscope technicians, allowing for rapid response in case of malfunction. For the cold storage, an alarm is activated if the temperature rises above the set threshold or if the relative humidity exceeds 50%, ensuring the preservation of stored materials. The alarm system of the freezer is tested regularly, at least twice a year.

These systems are monitored 24/7 to prevent any prolonged periods of disruption. The cold store and freezer are also regularly tested and maintained to ensure their reliability in case of emergencies. Both systems are designed with multiple layers of redundancy to minimize risks

to the stored genetic material. This proactive approach is essential for safeguarding the integrity and viability of the genebank's accessions.

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)*.

The management of the Genebank is assured by a fixed budget of the institute.

IPS2 – Describe how you secure adequate staffing of your genebank is?

Two full-time employees, with a combined workload of 180%, are financed through the regular budget. Additionally, one person with a 65% workload is employed on a fixed-term contract. During the grain harvest in July, two to three temporary workers are brought in to assist. These additional hands provide crucial support during peak workload periods, ensuring efficient and timely handling of the harvest.

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.

No contingency plan available.

CP2 - Provide information on the kind of training, security drills and other activities that your genebank gives to its staff to deal with emergency situations, if any.

Staff members of Agroscope in general receive regular training and updates on how to handle emergency situations, such as fires and health hazards. This training ensures that all personnel are well-prepared to respond quickly and effectively in case of an incident. Emergency drills are conducted periodically to reinforce protocols and assess preparedness. In addition, staff are educated on the use of safety equipment and first aid measures to minimize risks and ensure a safe working environment.

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. Given the fact we are covering seed, in vitro cultures and entire plants it might well be that not all aspects are covered by one and the same genebank. In those cases it is suggested that only the applicable sections are completed. Accordingly, at the beginning of each section of this chapter you will find a "navigation box" (highlighted in yellow) that will help you as user of the template to complete the correct section(s).

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.

Navigation Box on Maintaining Viability section

Seed – If applicable, please complete the section on Maintaining Viability for the activities related to seed genebanks (i.e. boxes 3.1.1.A – 3.1.3.A)

In vitro cultures – If applicable, please complete the section on Maintaining Viability for the activities related to in vitro culture (i.e. boxes 3.1.1.B – 3.1.3.B

Cryopreservation – If applicable, please complete the section on Maintaining Viability for the activities related to cryopreserved collections (i.e. boxes 3.1.1.C – 3.1.3.C)

Field genebanks – If applicable, please complete the section on Maintaining Viability for the activities related to field genebanks (i.e. boxes 3.1.1.D – 3.1.3.D.

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.).

Regular regeneration is carried out every 10-12 years, for some vegetable species in shorter cycles, to ensure the high quality and viability of the harvested seeds. All critical tasks performed during the regeneration process are documented in protocols, available in French, and published on the following website: www.swissnationalgenebank.ch . These protocols outline important steps of the procedure.

IV2 – Describe procedures how you deal with a) dormancy and b) hard seeds?

We rarely experience issues with dormancy, so no specific procedures are in place for it. However, when viability tests are affected by dormancy or hard-seededness, we repeat the test one year later. In certain cases, particularly with medicinal plants, it has been recommended to soak the seeds in hot water (less than 5 sec.) prior to testing to improve germination results.

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

Harvest and post harvest treatment as gentle as possible. Seeds are cleaned, dried and the initial viability is determined.

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*).

a) All new seed lots undergo rigorous testing to assess their quality and viability. For cereals, only seeds with over 90% viability are integrated into the genebank, while accessions with lower viability are regenerated again. We follow a regular regeneration schedule, replacing seeds every 10 years for cereals stored in the cold room, and every 30 years for those in the freezer, meaning no additional germination tests are required during this period.

For vegetables and medicinal and aromatic plants, germination requirements are more nuanced. A species-specific list has been developed for vegetables, outlining the appropriate viability thresholds. For medicinal and aromatic plants, the person responsible for each accession may accept a lower viability percentage, depending on the unique challenges and requirements of the species.

Testing frequency for vegetable species is every 5 to 10 years (depending on the staff possibilities), ensuring that the viability and quality of stored seeds are periodically evaluated. Seed viability tests are conducted according to ISTA protocols, which have been adapted and enhanced by Agroscope. For accessions regenerated by external partners, Agroscope's ISTA-certified seed-testing laboratory performs the viability assessments.

b) For viability testing, 50 to 100 seeds are used. If the results fall below the minimum acceptable percentage, regeneration will be planned.

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.

The Swiss National Genebank uses a custom-designed database to record and manage its seed collection: www.swissnationalgenebank.ch. This comprehensive system organizes and retrieves vital seed-related data, ensuring efficient management of the collection. For each accession, passport data and detailed information about seed lots, including viability test results and protocols, are recorded. The database also provides functionality for managing seed-lot decisions, enabling informed choices regarding the storage, utilization, and distribution of seed lots based on their viability and quality assessments.

All passport and evaluation data are publicly accessible.

VM3 - Please provide information on non-specific thresholds that you might use for viability of seeds (i.e. percentage of germination) and for the amount of seeds left of an accession to initiate regeneration? *In case you differentiate between self- and outbreeding species, please answer for each category separately.*
Regeneration is typically scheduled when germination test results are insufficient (see VM1) or when the remaining seed stock in the medium-term collection drops below the quantity needed for two regeneration cycles.

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.

Active Collection (Short and Medium-Term Storage):
Seeds are stored at +4°C with 50% relative humidity (RH) to maintain their viability for short to medium-term preservation.

Base Collection (Long-Term Storage):

Seeds are dried to equilibrium in drying cabinets set at 23ºC with 10% RH. After drying, the seeds are packed, vacuum-sealed in laminated aluminum bags, and stored at -18°C for long-term preservation.

SC2 – Provide details on the type of containers and the packaging procedures (and the corresponding equipment, if any) that you use.
Active collection: paper bags
Base collection and safety duplicates: laminated aluminum foil bags

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?
The goal is to reduce the relative humidity to below 8% for all species. Drying times are based on empirical data collected over time: 20 days for cereals and 3-4 days for legumes such as beans and peas.
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.
The total storage capacity of the genebank was designed to accommodate 15,000 accessions. Currently, the genebank conserves over 14,000 accessions, and both, the cold storage room and freezer are at full capacity.
Plans for expanding storage capacity have been formulated and are currently under consideration.

SC4 – 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).
Carefully planning of equipment acquisition and if necessary, replacement of equipment.

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

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

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*).

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.

VM3 - Please provide information on non-specific thresholds that you might use for vigor 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?

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.
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. Potatoes: cultivation

SC3 – Please include any other aspects regarding in vitro culture and storage conditions at your genebank that you regard as important.

B. Cryopreserved Collections

Agroscope has no cryopreserved collections.

Box 3.1.1.C Initial viability
IV1 - Describe the procedures or practices that you have in place to ensure the highest possible initial viability of your cryopreservation explant (source: in vitro pre-culture or directly from in situ explants), sterilization and explant isolation.

IV2 – Please provide any other information on procedures that you follow to ensure highest possible initial viability (e.g. elimination of virus diseases).

Box 3.1.2.C Viability Monitoring

VM1 – Please indicate whether (and if so when and how) you perform random viability tests after the initial viability test? [see also VM3 below]

VM2 - Please describe the information “system” that you might have in place that allows you to make more species or even accession-specific decisions.

VM3 – Indicate for the initial regeneration control,

a. what is the percentage of regenerated control explants relative to the total number of explants per accession;
b. any thresholds that you use [e.g. discard the material as not storable below a certain regeneration rate of the control],
c. whether you apply different procedures for accessions with erratic regeneration rates of the control [e.g. increase the amount of explants stored]; etc. and
d. what is the threshold what is the threshold number of remaining explants of a given accession under which you initiate regeneration for multiplication?

Box 3.1.3.C Storage Conditions (for the different types of collections i.e. short/medium- or long-term storage)
SC1 - Please provide information on the general system used for cryopreservation (liquid nitrogen or vapor phase, automatic tank filling or filling by hand). In case they vary from tank to tank, please provide details for each.

SC2 – Provide details on the type of cryopreservation tanks and storage system within the tank that you use.

SC3 - Do you treat different species differently?

SC4 – Please include any other aspects regarding storage conditions at your genebank that you regard as important.

C. Field Genebank Collections

The Swiss national genebank has no field Collection

Box 3.1.1.D Initial viability
IV1 - Describe the procedures or practices that you have in place to ensure the highest possible quality of your planting material, in particular during the growing from donor plants (e.g. cultivation practices in the field or greenhouse], phytosanitary pre-treatments, etc.).
IV2 – Describe any particular procedures you use (e.g. which organ of the donor plant you use to reproduce the planting material).
IV3 – Please provide any other information on procedures that you follow to ensure highest possible initial quality.

Box 3.1.2 .D Viability Monitoring
VM1 - Describe the routine field genebank monitoring system that you use.
(*The monitoring system could include the following aspects: regular control of disease or pest contamination, other types of damages to the plants, etc*).
VM2 - 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.
VM3 - Please provide information on non-specific thresholds that you might use for the quality of the individual plants (e.g. loss by weak growth) and for the amount of plants of an accession left in the field before additional initiating multiplication measures?

Box 3.1.3.D Maintenance Conditions
SC1 - Please provide details on your cultural practices (e.g. cultivation practices; pruning; irrigation; protection against animals etc.; pest and disease management; etc. applied to your field genebank material.
SC2 – In the case of annual or sub-perennial species that cannot over-winter in the field genebank, what measures do you take?
SC3 – Please include any other aspects regarding field genebank maintenance conditions at your genebank that you regard as important.

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 and 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 it might have specific (legal, technical, administrative) requirements a separate box on 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.

Navigation Box on Maintaining Genetic Integrity section

Seed – If applicable, please complete the section on Genetic Integrity for the activities related to seed genebanks (i.e. boxes 3.2.1.A – 3.2.5.A)

In vitro cultures – If applicable, please complete the section on Genetic Integrity for the activities related to in vitro culture (i.e. boxes 3.2.1.B – 3.2.3.B

Cryopreservation – If applicable, please complete the section on Genetic Integrity for the activities related to cryopreserved collections (i.e. boxes 3.2.1.C – 3.2.3.C)

Field genebanks – If applicable, please complete the section on Genetic Integrity for the activities related to field genebanks (i.e. boxes 3.2.1.D – 3.2.3.D

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)?

Yes, the initial number of received seeds is recorded in the information system.

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.

For storage at +4°C, seeds are kept in paper bags, while for long-term storage at -18°C, they are sealed in aluminum foil bags (as described above). The quantity of seeds per collection—active, base, and for the Global Seed Vault—is counted using an automated seed counter. The number of seeds per container is adjusted based on the container size and varies depending on the species and bag type.

Any surplus seeds are stored at +4°C for future use.

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 online available

The minimum threshold per accession varies by species. For wheat, barley, triticale, spelt and oats, 530 grams are maintained. For small grains of vegetables and industrial plants (excluding faba beans and soybeans), 12,000 seeds are conserved. For larger seeds, such as maize, soybeans, beans, and peas, the threshold is 8,500 seeds. For medicinal and aromatic plants, 9,000 seeds are preserved.

SCSS4 – Please provide details on other aspects that are important in this context.

None.

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;*
   Crop specific distance (wind pollinated cross pollinators, avoiding downstream planting in major wind direction) and isolation methods
b. *The use of pollination cages for insect pollinated species;*
   Yes
c. *The use of specific pollinators for insect pollinated species;*
   No
d. *Strategies to ensure that males and females participate equally in the reproduction*).

No strategy

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.)*
For outbreeding species the number of individual is kept as large as possible (normally about 40-50 plants).

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

A significant portion of the regeneration of vegetable, medicinal, and aromatic plants is carried out by collaborating NGOs. These organizations receive financial support from the Federal Office for Agriculture under the National Action Plan for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (NAP-PGREL) (https://www.blw.admin.ch/blw/de/home/nachhaltige-produktion/pflanzliche-produktion/pflanzengenetische-ressourcen/nap-pgrel.html in German or French). Specific guidelines and protocols for vegetable regeneration, including details on isolation distances, mother plants, and other key factors, have been established and approved. These guidelines are currently available only in German.,

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?;*
Normal standard field conditions and standard green-house conditions for regeneration, no special environmental conditions.

b) *Do you use controlled environments?;*
A greenhouse is used for producing seedlings, while a tunnel greenhouse is dedicated to the regeneration of crops such as lettuce, tomatoes, peppers, and eggplants.

c) *Do you collaborate with other genebanks in Europe?;* No explicit collaborations

d) *others*).

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

Box 3.2.4.A Seed Processing Procedures

SPP1 – Describe the protocol(s) that you use for threshing and seed cleaning.
Standard threshing and cleaning machines and by hand.

SPP2 – Describe the protocol(s) that you use for seed drying, including whether you use different drying procedures for different types of species.
Seeds are dried at 23°C with 10% relative humidity for approximately 20 days for most species, except beans (3-4 days). This process reduces seed moisture content to below 8%, ensuring optimal preservation.

SPP3 – Please describe how you keep the time between harvesting and the actual (long-term) storage of seeds as short as possible.
The duration required for processing seeds is largely dependent on staff availability. At a minimum, 3 months are needed, though on average, 6 months are required for completion from harvesting to long term storage. If the time between harvest and long-term storage needed to be shortened, additional staff would be necessary to meet the demand.

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).

The harvested seeds are initially stored in a well-ventilated barn at ambient outdoor temperatures. They are kept in cotton sacks to facilitate drying and remain there until they are ready to be threshed.
SPP5 – Describe the criteria you use to decide on seed quantity per accession for the long-term storage.
Minimum 4 generation cycles for regeneration.

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).
No known GMOs in the genebank
GMM2 – Describe the policy and procedures (if any) in your genebank, related to ensuring that distributed samples are not containing GMOs.

B. In vitro Culture Collections

No *in vitro* Collection

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)?

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.

SCSS3 – Please indicate whether or not you use a minimum number of in vitro plantlets per accession?

SCSS4 – Please provide details on other aspects that are important in this context.

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)

SPP2 – Describe the sub-culture duration (if not crop specific)

SPP3 – Describe the criteria you use to decide on in vitro plant quality (if not crop specific).

Box 3.2.3.B 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).

C. Cryopreserved Collections

No cryopreservation

Box 3.2.1.C Cryopreservation Containers and Sample Size
SCSS1 – Indicate if you document the initial number of explants of individual accessions?
SCSS2 – Please describe what kind of cryopreservation vessels (and equipment) you use (only if they differ from the corresponding answers in previous boxes), the procedure you follow with respect to separate material containing viruses or bacteria from healthy material

SCSS3 - What is the number of explants that you use as the minimum threshold per accession?

SCSS4 – Please provide details on other aspects that are important in this context.

Box 3.2.2.C Cryopreservation Procedures (as long as not crop specific)
SPP1 – Describe the protocol(s) that you use for preculture and pretreatment such as cold acclimation and dehydration.

SPP2 – Describe the protocol(s) that you use for cryopreservation proper (such as slow freezing, droplet freezing, vitrification, encapsulation etc.)

SPP3 – Describe the protocols that you use for regeneration (slow or fast rewarming, washing, dark periods etc.)

SPP4 – Describe the time span and method(s) of survival and regeneration controls

SPP5 – Describe the criteria you use to decide on explant quantity per accession for the long-term storage.

Box 3.2.3.C 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).

D. Field Genebank Collections

No field collection

Box 3.2.1.D Accession Sample Size
SCSS1 – Indicate if you document the initial number of plants of individual accessions (either as received from collecting missions or through exchange)?
SCSS2 – Please describe what kind of procedures you follow, if any, with respect to sub-sampling and subsequent place/container/etc. of maintenance?

SCSS3 - What is the number of plants that you use as the minimum threshold per accession? Are these plant numbers of a given accession based on genetic parameters (such as reproduction biology; heterogeneous samples)?
SCSS4 – Please provide details on other aspects that are important in this context.

Box 3.2.2.D Multiplication
PC1 - Please describe the multiplication procedures that you follow for your field genebank material (both, annual as well as perennial species)?
(*Please include in your description the following aspects if they would apply to your field genebank management procedures): :*

a. *Any control measures to minimize or avoid cross pollination between accessions (if applicable/relevant);*
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.)*

PC2 – Provide any other relevant information on procedures that you apply to control pollination of your germplasm in case of harvesting planting material from your field genebank material?

Box 3.2.3.D Planting Material Processing Procedures
SPP1 – Describe the protocol(s) that you use for threshing and seed cleaning, if used as an intermediate step for the management/multiplication of your field genebank accessions.

SPP2 – Please describe how and where you store (in a temporary manner) newly harvested planting material.
(Please provide details on the temperature and relative humidity of the storage room/space; what type of containers do you use, if any, etc.).
SPP3 – Describe the criteria you use to decide on the number of plants per accession intended for the long-term conservation.

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. Although most of the questions are not relevant in the ECPGR/AEGIS context, it was decided to keep the questions and to allow for a comprehensive genebank manual that can be used "globally".

Navigation Box on Ensuring Availability

Seed – If applicable, please complete the section on Ensuring Availability for the activities related to seed genebanks (i.e. boxes 3.3.1.A – 3.3.4.A)

In vitro cultures – If applicable, please complete the section on Ensuring Availability for the activities related to in vitro culture (i.e. boxes 3.3.1.B – 3.3.4.B

Cryopreservation – If applicable, please complete the section on Ensuring Availability for the activities related to cryopreserved collections (i.e. boxes 3.3.1.C – 3.3.4.C)

Field genebanks – If applicable, please complete the section on Ensuring Availability for the activities related to field genebanks (i.e.boxes 3.3.1.D – 3.3.4.D

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; who the requestor is;*
c) *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*).
Normally for 30-50 seeds for autogamy species and 40-60 seed for allogamy species are shipped. In specific cases (e.g. research projects) more seeds will be available based on case by case decisions.

The distribution policy can be found on www.pgrel.admin.ch . Seeds can be requested free of charge through this website for scientific, educational, or direct use by farmers. Requesters must agree to the terms and conditions of the SMTA (Standard Material Transfer Agreement) before submitting their request, using a shrink-wrap acceptance method.

There is no limit on the number of accessions per request; however, for large individual requests exceeding 50 accessions, we contact the requester to gather more information about their project.

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?

The typical handling time for seed requests is 10 days. However, during holidays, peak seasons, or for large orders, processing may take up to 3-5 weeks.

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.
All information about the accessions is available on the website www.pgrel.admin.ch, Accession number, accession name, species is written on the envelopes.

Box 3.3.2.A Ensuring Availability of Germplasm – Seed/Germplasm Stock Aspects
AGSS1 - Please provide details on the minimum/maximum amount of seed, plant, 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).
Crop specific; normally 30-50 for self-pollinating, 40-60 seeds for cross-pollinating vegetables. For larger seed species like peas and beans the amount is 20-30 seeds per accession.

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.
Generally, ordered seeds are sourced from the active collection (4°C), removed from paper bags, and repackaged into small paper envelopes.

AGSS3 – Describe how you manage the availability of adequate seed/etc. stock per accession, including the use of an absolute lower minimum of seeds per accession as the threshold to decide to regenerate.
If the seed number of an accession is below the minimum level, the accession is added to the regeneration list.

AGSS4 – Provide here information on any other aspects that are relevant to manage seed/etc. stocks.
None

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.

The national authority requirements, particularly those concerning quarantine diseases, are adhered to. Gene bank staff or designated personnel closely monitor all accessions during the regeneration process for pests and diseases. Additionally, new accessions and regenerated bean accessions from NGOs are tested for viruses.

AGHA2 – Describe how you follow plant quarantine rules and regulations when exporting germplasm abroad (especially to countries at another continent).
Outside of the EU, a phytosanitary certificate and/or import permit is often required.

AGHA3 – Describe if and how you distribute germplasm accompanied by a phytosanitary certificate or a "plant passport".
When a phytosanitary certificate is required, we send the material accompanied by a phytosanitary certificate issued by the Swiss Federal Office of Agriculture.

AGHA4 – Provide any other relevant information on procedures that you follow with respect to germplasm health aspects.
None

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 out-breeding species, heterogeneous accessions, and possibly other aspects.
See 3.3.2
GS2 – As GS1 above, but in case your germplasm samples do not possess the minimum viability, would you increase the number of seeds?
If there are complaints about seed viability or if we detect issues, we will send replacement seeds and, if possible, provide additional seeds or retrieve material from long-term storage. We value feedback from our users, as it helps us take corrective measures and test other accessions of the same species for potential issues.

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

B. In vitro Culture Collections

NA

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)*

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?

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.

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.

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).

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.

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).

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.

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

AGHA3 – Describe if and how you distribute germplasm accompanied by a phytosanitary certificate or a “plant passport”.

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

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.

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

GS3 – Please provide information on any other aspects related to in vitro plant supply.

C. Cryopreserved Collections

NA

Box 3.3.1.C Ensuring Availability of Germplasm – Policy Aspects
AGP1 – Describe the germplasm distribution policy that you follow at your genebank. (*Cryopreserved material is for distribution in exclusive cases only – e.g. for special research, please describe your policy*; *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*).

AGP2 – Indicate if you have as part of your service rendering policy aspects such as a “regular or maximum time” between receiving a germplasm request and distribution of the germplasm?

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.

Box 3.3.2.C Ensuring Availability of Germplasm – Germplasm Stock Aspects
AGSS1 - Please provide details on samples that you distribute (where relevant).

AGSS2 – Describe how you store, for distribution, the cryopreserved material of a given accession with respect to the use special equipment such as dry-shippers etc.

AGSS3 – Describe how you manage the availability of adequate cryopreserved material.

AGSS4 – Provide here information on any other aspects that are relevant to manage seed/etc. stocks.

Box 3.3.3.C 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. You could also add data on separation of differently infested material in separate cryotanks etc.

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

AGHA3 – Describe if and how you distribute germplasm accompanied by a phytosanitary certificate or a “plant passport”.

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

Box 3.3..C4 Germplasm Supply

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

GS2 – Please provide details of your routine methodology of containers etc. that you use to distribute cryopreserved material.

GS3 – Please provide information on any other aspects related to cryopreserved material supply.

D. Field Genebank Collections

NA

Box 3.3.1.D 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: crop/species specificity; whether or not sufficient seed stock is available; 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*).

AGP2 – Indicate if 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?

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.

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

AGSS1 - Please provide details on the minimum/maximum amount of plants or organs (cuttings, bulbs, tubers, etc.) per plant that you distribute per accession (where relevant, differentiated by species groups, i.e. annual or perennial; woody or herbaceous; other) and/or whether an accession is clonally or sexually propagated).

AGSS2 – Describe how you manage the availability of adequate organs per accession, including the use of an absolute lower minimum of plants per accession as the threshold to decide to multiply.

AGSS3 – Provide here information on any other aspects that are relevant to manage plant material stocks.

Box 3.3.3.D Ensuring Availability of Germplasm – Health Aspects

AGHA1 – Describe how you maintain field genebank (and any intermediate storage step) accessions with respect to health considerations, including whether you have a "policy" on accepting/planting only "disease free" planting material (as far as you can see or determine) accessions, at least for the quarantine pests and diseases.

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

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

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

Box 3.3.4.D 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 annual or perennial species, clonally or sexually propagated accessions, and possibly other aspects.
GS2 – Please provide information on any other aspects related to seed supply.
Only if sufficient seeds are available

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.

In Switzerland all data on conservation and evaluation of genetic resources are available on Internet (www.pgrel.admin.ch) or also on www.swissnationalgenebank.ch .

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, botanical names (taxonomy), seed storage data, characterization and evaluation data.

GD3 - In case your internal database(s) is/are different from the publicly available database(s), please provide details on both.

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).
Data are available on Internet and if requested, data can be provided as Excel or CSV file.

GD5 - Provide information on how technical support for development and maintenance of the documentation system is arranged
We have a small annual budget for technical support and future development of the database.

GD6 – Describe your genebank policy with respect to backing-up of the database contents, including with which frequency?
Regularly back-up system.

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

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?).
Internet, Excel or CSV file if requested

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).

All data are available in our internet database. No web services currently.

IE3 - Please indicate if your data is published to EURISCO. Describe which data is published to EURISCO and at which intervals.

Our data are published on EURISCO. Updates are approved by the Federal Office of Agriculture and are managed through the pgrel.admin.ch database.

IE4 – Please provide any other information on information exchange that is important for others to know.

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.*).
Accession number, accession name and taxon. More information on the websites.