



Bundessortenamt

Genebank Quality Manual



Bundessortenamt

Federal Plant Variety Office

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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;*
- b) who decides on what your mandate is and, if different,*
- c) from whom do you received the mandate;*
- d) the main aspects of the mandate; and*
- e) legal considerations on PGR as foreseen in national legislation.*
- f)*

The BSA is a federal authority in the organization of the Federal Ministry for Food, Agriculture and Consumer Protection (BMELV). The legal frame for the BSA activities is set by the Plant Variety Protection Law and the Seed Act. The legal frame for the BSA PGR activities is mandated by the BMELV decrees of October 2004, and August 2011, respectively, in conjunction with the national law to the Convention on Biological Diversity. The BSA genebank activities are organized according to plant species in two sections and include a) genebank activities for **fruit tree and small fruit species**, b) **seed and vegetatively propagated ornamental plants**. The national mandate of the BSA genebank activities is consigned by the BMELV and is part of the national technical program for biodiversity. In consultation with other genebank partners and expert groups the scopes of genebank activities are agreed upon. This includes the range of crop species to be maintained, its acquisition, conservation and distribution. The structure of the genebank of ornamentals is going to be established.

Ex-situ on-farm conservation of commonly known cultivars is applied. The selection, sampling, and conservation of accessions occur in the frame of the German fruit genebank network organization, it is coordinated by the JKI, and assisted by an independent advisory board, in cooperation with joint experts.

GA2 – Specific agreements. Does your genebank have any specific formal agreements with other genebanks 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) *a specific region, and/or*
- c) *the world), and*
- d) *which crops or genebanks fall under these agreements?*

No agreement on ornamentals species.

Fruit species: the Bundessortenamt is contractor of the German fruit genebank network (DGO), and partner of the European *Ribes* germplasm collection (RIBESCO).

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

- a) *please specify which crops or which geographic area, if applicable.*

The genebank acquisition policy follows three main principles, 1. to maintain varieties originally bred in Germany, 2. to maintain varieties from abroad if widely grown in Germany, and 3. to maintain varieties which may serve as donors for current or future breeding purposes such as pest and disease resistance. The scope is to capture and safeguard the genetic diversity on a national scale. In addition to these efforts, crop specific collections have been performed for fruit species and will be performed for seed propagated and vegetatively propagated ornamental plants.

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.)?

Before samples are included in the genebank, collection lists with preliminary botanical characterization are prepared.

It is intended to verify the botanical taxonomy and description by the collectors/taxonomists during the first multiplication in the genebank fields.

Ornamentals: We rely on the donor's information. Each accession with unclear description that is supposed to be included into the collection is firstly grown in a field or in the greenhouse to determine its taxonomic status and to compare the material with other accessions.

Fruit species: Crop expert panels are checking the variety identification in the field, on a contract basis; confirmation is then achieved by bio molecular techniques.

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).*

Ornamentals: Visual control of plant material is followed by cultivation to describe the sample and to compare the expression of characteristics with existing descriptions. With ornamental samples it is checked whether they are free of important diseases or pests.

Seed testing is done in accordance with ISTA standards. The recording of characteristics and the definition of purity aspects is done according to the regulations of the Union for the Protection of New Plant Varieties (UPOV), the examination protocols of the Community Plant Variety Office (CPVO), and if no documents are available, on the basis of national test guidelines. The BSA is an entrusted office based on the quality requirements of the CPVO, and applies an internal quality assessment system, as well.

Fruit species: All living plant material underlies the relevant plant health legislation, which consist of, among others, the EU Directive 2000/29, the national decree on propagating material (AGOZV), and the Saxon decree on Fire blight. The variety trueness to type is checked against in the same way as described for ornamentals, in accordance with the CPVO technical protocols, or UPOV guidelines, or national test guidelines. The quality aspects, as described for ornamental species, are applied in the same manner to the fruit sector.

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)*

SMTA is implemented on a regular basis; all accessions are provided with the use of SMTA, if the material is requested for education, research or breeding purposes; otherwise a simple declaration of the requesting body is considered sufficient. All documentation is recorded in our genebank information system. With ornamental plants a MTA is implemented.

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).*

Ornamentals: Preferential planning and implementing collecting missions for crops are done in close cooperation with crop experts of propagation nurseries and in scientific institutes or with collecting private donors.

Germplasm collecting activities are generally based on written contracts between BSA and submitting partners. The priority for collecting mission is set in relation to the available plant material and the necessity to maintain endangered species.

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);*

Seed samples are divided in two samples. With roses there is no specific and comprehensive safety duplication for the time being. This is scheduled to be organized in the future. If plants of an ornamental sample have to be replaced by new material of the variety, the characteristics of the new plants are compared with descriptions of the previous material. In case of fruit, it is safeguarded by contract that at least 2 duplicates of each of the German fruit genebank network's accessions are maintained at two different locations.

- b) The location(s) where you store your safety duplicates (country; genebank);*

Fruit species: At test station Wurzen, in cooperation with various other contractors of the German fruit genebank network.

Ornamentals: test station Hannover, will be developed in the future

Seed propagated ornamentals; cold storage at test station Hannover

- c) *Whether or not you are using a formal agreement with the genebank(s) that store your duplicates?*

Contracts of the German fruit genebank network are applied among partners.

- d) *Whether the safety duplicates are stored under conditions comparable to your own? Please provide details;*

Fruit species: The duplicates are stored under the same conditions; tree fruit species are planted at different stations, different rootstocks may be used.

Ornamentals: actually duplicates are maintained in different samples at one genebank. With the extension of the genebank for seed propagated ornamentals the system will be developed together with the other partners as the duplicates will be maintained by the different partners.

Seed propagated ornamentals: cold storage building

- e) *Do you maintain safety duplicates from other genebanks at your genebank? If so, do you know any details of that material?)*

Ornamentals: no

Fruit species: The testing station Wurzen maintains accession duplicates of apple, sweet and sour cherry for the JKI outside the scope of the German fruit genebank network.

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

Samples of fruit species and ornamentals (i.e. maintained in field genebanks) are kept with several plants.

Seed samples are divided in separate samples with separate storing.

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).

No earthquake area; no high wind/storm exposure; standard construction practices were followed; building containing cold stores are of solid construction according to national standards. Fruit species and ornamentals are stored in a region where floods are not possible.

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 genebanks for fruit species and ornamental plants are located in an entirely fenced territory supervised by a security service at night; it provides locked doors; alarm systems for temperature deviations in cold stores, fire detectors; In case of electricity blackouts standby generators are available.

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

On public holidays and during the weekend the staff controls buildings and cultivation areas. Access is provided only to staff; if third parties visit the genebank this is only possible together with staff members. A contracted alarm service company is automatically informed in case of unlocking or burglary.

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).*

Stand-by duty staff for the entire institute consisting of a technical engineer and an electrician. Based on a facility management system an alarm system for temperature deviations in greenhouses, in cold stores, in working rooms and offices exists. In case of electricity blackouts standby generators exist and the cold store can keep at safe cold temperatures for many hours. In case of a break-down an on-call duty will be alarmed.

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

Buildings: Computer controlled facility management system.

Fields: daily control by staff; recording of weather conditions.

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 BSA is an independent federal authority under the jurisdiction of the Federal Ministry of Food, Agriculture and Consumer Protection. A direct communication concerning juridical, administrative and agricultural items exists.

Contracts with field workers only if long-term training has recognizably been applied or working experience has been checked.

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

Staff is secured by permanent work contracts (see above).

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.

Referring to the BSA quality management system which has been developed for testing as part of the Plants Breeders' Rights application procedure, an integrated pest and disease management is applied. In the fruit sector a supervision by the regional plant health inspection service is applied on a regular basis. The station is involved in local pest and disease prognosis programs. The genebank will develop until 2014 a contingency plan to cover all conceivable risks.

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 is informed and trained regularly on emergency situations like fire and health hazards; first-aid and security responsibilities are announced and regularly trained.

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.).

The genebank for seed propagated ornamentals started in 2012. Reproduction protocols (cultivation, pollination, pre- and post-harvest treatments, etc.) are elaborated on, according to the species concerned.

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

Carried out according to ISTA standards, not applicable for the genebank of fruit and ornamental species.

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

Harvest and post-harvest treatments as gentle as possible. Crop specific protocols are currently developed.

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).*

Crop specific protocols for germination testing internally (only in German) available following ISTA standards.

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.

Germination tests are performed following a species-specific schedule that takes into account empirical expertise on the decay of germination rates.

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.*

For self- and outbreeding species regeneration takes place, if 1. germination rate is below 70%, or 2. remaining seed stock has been depleted below an seed amount 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.

Actually short-term storage of ornamentals in aluminum bags after drying for some days at 20 - 25°C to a seed moisture of 6-8 %. at 6 °C in the cold storage room.. For a long-term storage it is intended to freeze the seed in aluminum bags to - 16 ° C for a period of about 15 years. Some further storage techniques will be checked in the next years.

SC2 – Provide details on the type of containers and the packaging procedures (and the corresponding equipment, if any) that you use.

Active collection: laminated aluminum 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?

6 - 8 % seed moisture in the aluminum bags for all species (no species-specific differentiation); in the cold storage building, with controlled temperature by a computer system.

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.

Start of genebank for seed propagated ornamentals in 2012 with 90 samples, available capacity is filled to < 1 %.

Fruit species: long-term storage of propagating material by means of in-vitro cultivation (strawberry cultivars), and cryopreservation (apple) at JKI, or at MTT, Finland (*Ribes* species), respectively.

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.

ISTA standard procedures and international used genbank standards

A. In vitro Culture Collections (not done at BSA)

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.

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

B. Cryopreserved Collections (not done at BSA)

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.

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

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.).

From 2013 onwards, mother plants of selected accessions of small fruit species will be held in an insect safe greenhouse, in order to take virus free propagating material whenever needed. Mother plants are inspected on a regular basis by the local plant health inspection service. In case of the propagation of tree fruit varieties, virus free scions are taken upon availability and virus free rootstocks are used exclusively. The procedure is described in the BSA quality management manual. BSA is accredited as examination office following the entrustment requirements for CPVO examination offices.

IV2 – Describe any particular procedures you use (e.g. which organ of the donor plant you use to reproduce the planting material).

Fruit species: reproduction is carried out by means of grafting (tree fruit species), hardwood or softwood cuttings (currents), and runners (strawberry), or by tissue culture (rasp- and blackberry) carried out by third parties, respectively.

In relation to good horticultural practice ornamentals of seed propagated species are reproduced by seed. Material of species propagated by cuttings is reproduced by cuttings. Grafted plants have to be propagated in special nurseries by grafting.

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*). Depending on the plant development and on climate conditions pests and diseases are controlled in intervals.

In case of fruit species the following measures are applied: regular control by the regional plant health inspection service, contribution in pest and disease prognosis programs; field control by specially trained test station personal every week, pest monitoring (pheromone traps); information received from the regional plant health advisory service; monitoring and recording of local weather conditions; applying good agricultural practice; integrated pest and disease management.

Ornamentals plants are controlled regularly in relation to good horticultural practice. This includes controlling of the upper parts of the plants and in case of pot plants the root ball.

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.

Monitoring takes place frequently during growing season by permanent staff and there is an continual communication with supporting partners and experts. In ornamentals a working group with external experts will be established in 2013 to comment the current work of the genebank and the development of plants. Data and information are included in the genebank information system. A computer based recording system is used for all chemical treatments and all cultivation measurements applied in the open field.

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?

Fruit species: Standard procedures of the German fruit genebank network are applied, with immediate replacement of plants in case of decay. For details see <http://www.deutsche-genbank-obst.de>

Ornamentals: If there are less than 3 grafted plants, plant material will be ordered from reliable suppliers. Autovegetatively propagated species will be propagated by cuttings. For seed propagated ornamentals a multiplication strategy is tested and will be developed.

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.

The procedure is described in the BSA quality management manual which has been developed based on the CPVO entrusted requirements (http://www.cpvo.europa.eu/documents/qas/Entrustment_Requirements.pdf). BSA is accredited as examination office following the entrustment requirements for CPVO examination offices. Cultivation and pest/disease management is done according to good agricultural practice with experienced staff, IP standards are applied, the local plant health inspection service is involved in such measurements. An intensive communication exists, with experts of institutes which are busy with trials of fruit and ornamental research institutes.

SC2 – In the case of annual or sub-perennial species that cannot over-winter in the field genebank, what measures do you take?

Seed propagated varieties are overwintered as seed. In case of non-winter hardy fruits and vegetatively propagated ornamentals the plants are overwintered in a glass houses or are sheltered against frost damage.

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)?

Number of seeds and/or weight of sample are recorded.

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.

Laminated aluminum bags, tubes and small containers. Based on the start of the genebank of seed propagated ornamentals in 2013, the number of seeds is not yet fixed.

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 on-line available

Species (accession) specific thresholds (amount allowing for at least two sowings) depending on reproduction biology, heterogeneity of accession and bio status.

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

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 in the greenhouse and isolation methods (isolation cabins, tents, bags) are used. If the plants are cultivated in the open air time-delayed cultivation is done to avoid uncontrolled pollination.

b. The use of pollination cages for insect pollinated species;

c. The use of specific pollinators for insect pollinated species;
No strategy so far.

d. Strategies to ensure that males and females participate equally in the reproduction).

No strategy so far.

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.)

No strategy so far, a strategy will be developed with the henceforth species.

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

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?;*

Comparable local field conditions and comparable standard greenhouse conditions for regeneration, no specific environmental conditions.

b) *Do you use controlled environments?;*
In the greenhouse conditions are controlled.

c) *Do you collaborate with other genebanks in Europe?;*
Not yet developed, to be done on the base of exchange of experience.

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.
Has to be developed in relation to other genebank procedures.

SPP2 – Describe the protocol(s) that you use for seed drying, including whether you use different drying procedures for different types of species.
Has to be developed in relation to ISTA standards and other genebank procedures.

SPP3 – Please describe how you keep the time between harvesting and the actual (long-term) storage of seeds as short as possible.
Has to be developed in relation to ISTA standards and other genebank procedures.

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).

Has to be developed in relation to ISTA standards and other genebank procedures. Technical equipment is available.

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

Has to be developed in relation to ISTA standards and other genebank procedures.

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).

GMO varieties are not procured in the BSA 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**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)?

no in vitro collection foreseen.

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). We do not store GMOs in the BSA genebank.

C. Cryopreserved Collections**Box 3.2.1.C Cryopreservation Containers and Sample Size**

SCSS1 – Indicate if you document the initial number of explants of individual accessions?

We do not have own cryopreservation facilities, but cooperate with other institutes on this matter with fruits.

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.

Fruit species: Apple accessions are maintained under cryopreservation in the JKI-institute Dresden Pillnitz. Accessions of *Ribes* species are kept under cryopreservation at the MTT institute in Finland.

Box 3.2.2.C Cryopreservation Procedures (as long as not crop specific)

SPP1 – Describe the protocol(s) that you use for pre-culture 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.

Fruit species: In accordance with the RIBESCO contract.

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).

We do not store GMO varieties in the BSA genebank.

D. Field Genebank Collections

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)?

The number of plants is recorded and stored in a data base. Any field planning is recorded, field plans are available.

SCSS2 – Please describe what kind of procedures you follow, if any, with respect to sub-sampling and subsequent place/container/etc. of maintenance?

none

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)?

Fruit species: according to species 2-4 plants per accession, vegetatively propagated, all of same genotype.

Ornamentals: 3 plants, vegetatively propagated, all of same genotype.

Seed propagated ornamentals: has to be developed.

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

Fruit species: Standard procedures of the German fruit genebank network are applied.

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)?

Fruit species: multiplication only for the use of replacing plant losses in the collection. Propagation of fruit and ornamentals according to general practical experience. Procedures will be developed according to genera and 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);*
not relevant
- b. *The use of pollination cages for insect pollinated species;*
Seed propagated ornamentals are cultivated time-delayed or in sufficient distances in a glasshouse to avoid uncontrolled pollination. Gaze tents will be used if necessary.
- c. *The use of specific pollinators for insect pollinated species;*
Support of pollination by hand pollination with paint brushes.
- d. *Strategies to ensure that males and females participate equally in the reproduction).*
not relevant

- 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.)*
not relevant

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?

Ornamental species: Propagation in greenhouses or under controlled conditions to control/avoid uncontrolled pollination.

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

Has to be developed for seed propagated ornamentals

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.).

not relevant

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).*

All requests are processed based on SMTA, for ornamentals an MTA is used. For inbreeding crops 30 seeds are shipped. In case of outbreeding and heterogeneous crops/accessions 100 seeds are shipped. Further details have to be defined for the development of the ornamental genbank. For vegetatively propagated plants distribution policy has to be developed.

Fruit species: not applicable.

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?

Has still to be developed according to stored genera.

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.

Passport data, other information only upon request and availability.

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; by rule of thumb: 30 seeds for inbreeding species, 100 seeds for outbreeding 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.

Each harvest from a given accession will be placed in a different bag/container.

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.

The available amount of seed and the corresponding germination data can be retrieved for each accession from the projected genebank information system. The minimum amount of seeds is to have enough seed for two sowings. For vegetatively propagated ornamentals the minimum amount is three plants.

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

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.

Ornamentals: No crop specific tests.

In case of fruit species, seed is only conserved in case of seed propagated varieties of strawberry. This is done in accordance with the standards applied for ornamentals.

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

not relevant

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

not relevant

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

In case of fruit species: see above

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.

Depending on availability: Selfbreeding crops 30 seeds; outbreeding and heterogeneous crops/accessions around 100 seeds.

GS2 – As GS1 above, but in case your germplasm samples do not possess the minimum viability, would you increase the number of seeds?

Only if sufficient seeds are available.

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

A. In vitro Culture Collections (not at BSA)

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)

not relevant

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.

B. Cryopreserved Collections (not at BSA)

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).

not relevant

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.

C. Field Genebank Collections

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).

SMTA /MTA or simple declaration as formal agreement to distribute the germplasm with a declaration how to use 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?

Ornamental species: Upon availability only after field harvest and if sufficient seeds or plants are available, no defined maximum time.

Fruit species: vegetatively propagated material is distributed in winter (dormant budwood) or in summer (budsticks) in case of tree fruit varieties; roots or rooted canes (raspberry, blackberry) are distributed in early spring, rooted canes (raspberry) or runners (strawberry) are distributed in summer.

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.

Passport data; officially recognized description only upon request and availability.

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).

Seed propagated ornamentals: 30 seeds for inbreeding species, 100 seeds for outbreeding species.

Fruit species: small amounts upon availability; clonally only; 2-3 dormant shoots for grafting, or 1-2 budsticks for summer grafting, respectively.

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.

Ornamentals plants: maintained permanently in the field if number of seeds/plants is below a defined level or/and in a defined quality.

Fruit species: to be held healthy and vigorous; multiplication done if 1 out of 2 plants starts showing symptoms of decay.

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.

Plant health inspection service is involved, reference to AGOZV and to EU Directive 2000/29 is made; control by local plant health inspection service if necessary.

Fruit species: stock plants to be held under insect safe greenhouse conditions.

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

Fruit and Ornamental species: in accordance with EU regulations.

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

Fruit and Ornamental species: in accordance with EU regulations.

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.

Only depending on availability; clonally propagated accessions in case of fruit species and vegetatively propagated ornamentals.

GS2 – Please provide information on any other aspects related to seed supply.

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.

(I) Internal management system which includes passport data, characterization and evaluation data, handling of botanical names, seed storage data, germination data, regeneration information, etc.

(II) Data management for morphological data for the internal use and for a data exchange

(III) Internet system publicly available will be developed in 2013/2014 for ornamentals and fruits

Steps I,II and III are under development.

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, characterization and evaluation data, handling of botanical names (taxonomy), seed storage data, germination data, regeneration information etc.

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

not relevant

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).

Common correspondence by hardcopies or by emails; if requested and available additional data can be provided as Excel file.

GD5 - Provide information on how technical support for development and maintenance of the documentation system is arranged

IT section is responsible for technical support.

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

An automatic permanent back-up system is implemented.

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?).

By sending them to PGRDEU by email (MS Excel file); we establish an internet system publicly available in 2013/2014.

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).

Passport data are provided for the time being. No web-service system is available actually.

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

Our data (passport data) are published via Federal Office of Agriculture and Food to EURISCO and will be updated regularly.

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.).

MultiCropPassportData + EURISCO DESCRIPTORS, if available.

Occasionally: recognized variety description.