



Instituto de Conservación y Mejora
de la Agrodiversidad Valenciana

**Operational genebank manual of the
Genebank of the Institute for the Conservation
and Improvement of the Valencian
Agrodiversity (COMAV),
Polytechnic University of Valencia, Spain**



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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.*

In Spain, Genetic Resources are under the mandate of the Ministerio de Agricultura, Pesca y Alimentación (Ministry of Agriculture, Fishery and Food) and the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, INIA (National Institute of Research and Agricultural and Alimentary Technology). Besides, the Spanish Center of Genetic Resources (CRF) is the coordinator of the Spanish Genebank Network. We receive mandate from these institutions.

Our mandate is to maintain seeds of species belonging to vegetable crops and coordinate, together with the Vegetables Genebank of Zaragoza, the “Supernode Vegetables”, which includes nine genebanks (nodes), two associated nodes and four associated members, all maintaining and working with vegetable crops.

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?*

Our genebank has the mandate from the Spanish Center of Genetic Resources to conserve seeds of vegetable crops. We do not have any international specific agreement.

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

Please specify which crops or which geographic area, if applicable.

Currently germplasm acquisition is not a priority in our genebank.

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.)?

- For materials received from other genebanks we rely on the donor's information
- For materials collected from farmers we rely on the information provided by them and on our knowledge about the traditional varieties of each crop
- For wild relatives collected in their natural habitats we rely on our own experience and on taxonomic expertise
- In all cases we check the information when the material is characterized/regenerated

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).*

Quality parameters for inclusion into genebank storage are based on the Genebank Standards for Plant Genetic Resources for Food and Agriculture (FAO 2014). , In short, we use a visual control to eliminate any material contaminating the seeds and seeds of poor quality. We conduct viability tests and tomato and pepper seeds are disinfected by chemical and/or heat treatment. Correct identification of a given accession is checked every time an accession is regenerated.

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).*

Since January 2013, the SMTA is implemented as a general rule for the material distributed, both included and non-included in Annex I of the International Treaty. The SMTAs is implemented in different ways depending on the recipients. If they use the easy SMTA, we implement them in that way. If not, we send the SMTA by email and signatures are scanned. Information about signed SMTAs is recorded in spreadsheet files at the Genebank and reported to FAO.

Exceptions to this general rule are for:

- Seeds delivered to growers. In these cases a simplified MTA is signed.
- Contracts with other genebanks/seeds companies to regenerate accessions. In these cases a specific contract is signed between the Rector of the University and the Seed Company/Genebank.

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.*

Collecting is not a priority in our genebank.

GC2 – Provide any additional information on the germplasm collecting activities of your genebank, including the collaboration with others.

n.a.

2. Ensuring Security

This chapter refers to the security of the 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);*

Approximately one thousand seeds, depending on the crop, of each regenerated accession are stored in another Spanish genebank and maintained at -18°C. The maintenance of all our collection in the Spanish Center of Genetic Resources (CRF) is mandatory in our country.

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

Safety duplicates are stored in the Spanish Center of Genetic Resources in Alcalá de Henares, Spain, and a part of our collection in the Vegetable Genebank in Zaragoza.

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

The formal agreement is included in the Permanent Activities Projects for which we apply every three years to the INIA. Also, the obligation of sending a sample of each regenerated accession to be stored at -18°C as safety duplicate in the CRF is stated in the National Legislation.

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

Safety duplicates are stored dried and at -18°C. They are not comparable, we store the seeds at 4°C (active collection).

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

We maintain safety duplicates from the genebank of Zaragoza. We know their passport data and year of regeneration.

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

The safety duplication policy is specified in the National Legislation and it is stated that for seed genebanks a sample of each regenerated accession must be sent to the Spanish Center of Genetic Resources to be stored at -18°C. For vegetatively propagated crops, they must have a duplicate in another genebank that maintains the same crop.

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).

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 genebank is located on the 1st floor of a building with 6 floors. To enter in the genebank there is a security door and to enter in the cold chambers there is an additional door. Staff of the genebank have all the necessary keys.

There are fire detectors, an alarm system in the entire building and a standby generator.

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

n.a

Box 2.1.3. Security Equipment

SE1 – Provide details on the kind of emergency (back-up) equipment or arrangements that you have in place to ensure permanent electricity and cooling.

Aspects to consider are:

- a) *“back-up” compressors for your cold rooms;*
- b) *generator;*
- c) *regular maintenance and trial runs;*
- d) *other.*

There is an emergency power generator for cold chambers in case of a power failure on the public utility grid. These chambers also are provided with a device with the function of cutting off the electric current automatically when the temperature exceeds 15°C. We have a regular maintenance conducted by an external Company.

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

Outside of each chamber there is a display that shows the temperature inside. There is no system for monitoring relative humidity in cold chambers.

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.*

To obtain funds, we apply every three years to a public call launched by INIA to request funds for the Permanent Activities of the genebank (conservation, control of viability, regeneration, primary characterization and delivery of seeds to requesters). The quantity of funds received from this source is variable and uncertain depending on the funds allocated to this budget item. We do not have any internal “security” of accessing these funds. In addition, the COMAV allocates 15 000 euro per year to support the genebank. This amount is agreed by all researchers of the COMAV and is subjected to changes if a different decision is taken by the COMAV’s Scientific-Technic Commission.

We do not have any “long-term” security and stability of funding.

To overcome the scarce funding, the genebank staff has to collaborate in other

projects (TRADITOM, G2P-SOL, BRESOV, Prometeo, etc.). This allows the genebank to receive funds from projects but also increases the workload for the genebank staff that is composed of one director, one curator and three persons hired on the allocated budget.

IPS2 – Describe how you secure adequate staffing of your genebank.

Staff of the genebank (except the curator and the director, who are permanent staff of the University), depend on the availability of funds from INIA, COMAV and different projects we are involved in. The positions of the three hired persons are not fully secure.

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.

There is an emergency plan established by the Polytechnic University of Valencia (UPV) for the building where the genebank is located. This plan covers extinction of small fires and evacuation of the building. There is no specific plan for the genebank.

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.

Members of the genebank have received training in fire-fighting and a general course on the prevention of occupational risk. This is mandatory in our University.

3. Germplasm Maintenance

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

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

3.1. Maintenance of Viability

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

A. Seed Collections

Box 3.1.1.A. Initial seed viability

IV1 – Describe the procedures or practices that you have in place to ensure the highest possible initial viability of your seed, in particular during regeneration and post-harvest (e.g. cultivation practices, pollination aspects, use of specific equipment as shelters, storage of harvested seeds, cleaning, etc.).

The first step is to grow the different crops in their more suitable season and to promote the fruit set using mechanical means (i.e. vibrator) in autogamous crops and pollinator insects or hand pollination in allogamous ones. Fruits are always harvested at physiological maturity. In case of wet seed extraction, the seeds are extracted from the fruits as soon as possible by different methods according to the type of fruit (tomato, eggplant, pepper, melon...). After being extracted from the fruits, empty and broken seeds are removed. Once the seeds are dried they are placed into the glass jars with silica gel to reduce their inner moisture content. In dry extraction we use a domestic air-machine to remove the empty seeds before placing the seeds in the containers with silica gel.

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

Species with dormancy stored in our genebank are *Luffa* and some wild *Cucumis*. We do not perform any special procedure with them. We store the seeds for several years until the dormancy disappear.

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

No additional procedures are followed.

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.*

For three years now, all the regenerated accessions are tested for viability before being stored in cold chambers. There is no detailed planning to monitor viability of seeds of all the collections due to insufficient staff. We carry out the monitoring of seed viability by selecting the older accessions.

VM2 – Please describe the information “system” that you might have in place that allows you to make more species- or even accession-specific decisions regarding when the next monitoring should take place.

We do not have any information system for specific accessions or species.

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 when the last regenerated sample of the accession is older than 20 years and the viability is below 60%, or when the remaining seed stock is lower than 200 seeds.

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.

Drying chamber: 15°C and 58% HR.

Cold chamber: Temperature 4°C, seeds are placed in glass jars with silica gel as humidity control agent. Humidity conditions in the cold chambers are not controlled.

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

Glass jars of 250cc with screw metal caps. We also use glass jars of 500cc for bigger seeds, but to a lesser extent. Heat-sealer and aluminium bags are available in COMAV to store duplicates in -18°C chambers in the future.

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?

We use silica gel as humidity control agent. Using silica gel the inner moisture content of seeds is around 5-6%. We do not carry out specific humidity test and do not treat different species differently.

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 genebank has six cold chambers at 4°C and two cold chambers at -18°C. Each chamber can hold 11 200 glass jars. Nowadays 40% of the 4°C chambers are occupied and the two -18°C chambers are still empty.

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

n.a.

3.2. Maintaining Genetic Integrity

Maintaining the genetic integrity of an accession can be achieved by minimizing genetic drift which may occur predominantly during the process of regeneration, due to too small numbers of individuals being planted, sub-optimal pollination and/or the introgression of alleles from other accessions or commercial crops or crop wild relatives. The following aspects are important for achieving the objectives of maintaining genetic integrity and should be briefly described. Please note that a distinction should be made between seed numbers for an accession and seed numbers for sub-samples per accession. The latter only applies if the seeds of a given accession are being stored and distributed as sub-samples. As genetically modified material gets 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.

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 COMAV's genebank documents the weight and number of seeds.

SCSS2 – Please describe what kind of containers (and equipment) you use, the procedure you follow with respect to sub-sampling, seed numbers per container, etc.

We use glass jars of 250cc with screw metal caps. We also use glass jars of 500cc for bigger seeds, but to a lesser extent. Regarding the amount of seeds we try to fill in the jar as much as possible. In case of big seeds (lima bean, faba bean, etc.) we use bigger containers (500 cc) and aluminium bags. With heterogeneous accessions, in case we consider there is more than one type of interest, we give a new accession number (BGVxxxxxx) to the new type. We consider as a new type the plants that do not fit the local name or the type with lower number of plants within the accession.

SCSS3 – What is the number of seeds that you use as the minimum threshold per accession? Are these seed numbers of a given accession based on genetic parameters (such as reproduction biology; heterogeneous samples)? Please provide URL of your protocols if these are available online.

We conserve accessions even if the number of seeds is very low. In these cases we record this issue in our databases.

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

n.a.

Box 3.2.2.A. Pollination Control

PC1 – Please describe the regeneration procedures that you follow for self- and outbreeding species.

Please include in your description the following aspects:

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

Plants of autogamous species are grown in insect-free glass or mesh greenhouses. Self-pollination is favoured by using vibrators. Ten plants per accession are normally used.

In case of allogamous species bearing big flowers easy to handle like some cucurbitaceous crops, growing plants is also carried out in glass or insect-proof mesh screen greenhouses without pollinators. Pollination is performed manually. At least ten plants per accession are normally used if possible, following the recommendations of the ECPGR Cucurbits Working Group ([General guidelines for regeneration, processing and storage of cucurbit species \(April 2011\)](#)).

The rest of allogamous species are cultivated in pollination cages with pollinators (*Lucilia sericata*, *Brassica* spp.,...) or in open field in the absence of accessions of the same species or compatible species. Twenty plants per accession are normally used if possible.

Spinach is the unique monoecious crop in COMAV's collection. We do not use a special strategy to ensure the equal participation of male/female plants.

In all cases, to avoid genetic drift an equal number of fruits is collected from each plant.

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

Some regeneration trials of cucurbits are carried out in greenhouses with pollinators, growing non-compatible species to avoid crosses between accessions.

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?*
- b) *do you use controlled environments?*
- c) *do you collaborate with other genebanks in Europe?*
- d) *others.*

Usually, regeneration of solanaceous and cucurbitaceous species is carried out in mesh greenhouses and the plants are cultivated in soil or in containers with coco peat substrate using a fertigation system. Other crops, like leafy vegetables, *Brassica* or *Allium* species are grown in soil. We are not able to reproduce environmental conditions of the collecting sites, especially for wild relatives, although in many cases the conditions are very similar.

Occasional collaborations with other European genebanks have been carried out. Recently (2014 and 2015) a regeneration of pepper accessions was taken up with CGN.

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

n.a.

Box 3.2.4.A. Seed Processing Procedures

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

The procedure is different depending on the type of fruit/seeds.

WET EXTRACTION:

In case of fruits where the flesh surrounds the seeds (tomato, eggplant, cucumber, watermelon, etc.) the fruits are peeled (if necessary) and mashed. In species in which seeds are covered by mucilage (tomato, cucumber) it is removed by fermentation (tomato, cucumber). After that, seeds are separated from flesh by decantation.

In case of melon, pumpkin or pepper, where the flesh does not surround the seeds, it is not necessary to crush the fruit and they are separated from flesh with a tap of running water and strainers of different sizes.

DRY EXTRACTION

By using strainers of several hole sizes and a domestic air-cleaner machine, we separate the seeds from the rest of fruit particles.

SPP2 – Describe the protocol(s) that you use for seed drying, including whether you use different drying procedures for different types of species.

We use the same protocol for all species.

If wet extraction was necessary a thin layer of wet seeds are distributed on a filter paper sheet and introduced in a chamber of 15°C and 58% HR. As soon as the seeds are dried they are put into glass jars with silica gel. When silica gel turns colour, we change it until the colour is stabilized.

In case of dry extraction, once the seeds have been cleaned they are put into the glass jars with silica gel and it is changed until stabilized.

SPP3 – Please describe how you keep the time between harvesting and the actual (long-term) storage of seeds as short as possible.

Extraction of seeds from the fruits is made after harvesting. In some cases fruits can stay in cold chambers (10°C) for a few days between harvest and extraction of seeds. When extraction of seeds is completed for all the regenerated accessions, seeds are sent to the Spanish Center of Genetic Resources (Alcalá de Henares, Madrid) for their long-term storage. This can take several weeks. During this period seeds are stored at 4°C in COMAV's chambers. When seeds arrive in Madrid their viability is checked and they are stored at -18°C.

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.

Fruits destined to wet extraction are conserved in a cold chamber (10°C) and once seeds have been extracted they are introduced in dry chambers (15°C, 58% HR) and subsequently in glass jars with silica gel, changing the silica gel until their dehydration at 5-6% RH.

Fruits destined to dry extraction are conserved in dry chambers (15°C, 58% HR) until the seeds are cleaned. After that, the seeds are maintained in glass jars with silica gel until they are completely dry (5-6% RH).

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

Healthy seeds with viability higher than 80%.

3.3. Ensuring Availability

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

A. Seed Collections

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

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

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

- a) crop/species specificity;*
- b) whether or not sufficient seed stock is available; 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.*

- a) The policy aspects are the same for all species
- b) Accessions are delivered if sufficient seed stock is available, regardless of the requester
- c) Delivery of seeds to farmers is limited to five accessions per request
- d) Requesters are asked not to request the same accessions already requested previously
- e) As said previously, delivery of seeds to farmers is limited to five accessions per request. Requests of a high quantity of accessions are considered in a case by case basis
- f) SMTA is used for research and breeding purposes and a more simplified MTA for farmers

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?

We try to deliver the requests in less than one month.

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.

We provide passport data.

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).

We usually provide 35 seeds per accession, both for allogamous and autogamous crops. In case of crops with big seeds (bean, broad bean, *Cucurbita* genus) we provide 20 seeds.

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

We use a container for the original sample collected or received from another institution. When this accession is regenerated we use a new container to store the regenerated seeds. We never mix the regenerated seeds with the original ones. For each regeneration cycle a different container is used.

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

We decide to regenerate an accession when the number of seeds is lower than 200.

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

n.a.

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

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

We disinfect tomato and pepper seeds before storing at low temperature (heat treatment and disinfection with bleach and sodium triphosphate). For the other crops no treatment is applied, but broken, empty or malformed seeds are discarded.

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

To export seeds to another continent, the requester obtains an Import Permit that is sent to us previously to the shipment of seeds.

If necessary, we obtain:

- A Regular Phytosanitary Certificate (PC) when there are no specific restrictions. This PC is issued by the Plant Health Service Office at the Valencian Harbour.
- If there are specific restrictions we conduct laboratory analysis to ensure the health of the seeds regarding the required pathogens. These laboratory analyses can be conducted in our Labs at the COMAV- Polytechnic University of Valencia, or in an Authorized Company. In these cases the reports made by the laboratories are attached to the Regular Phytosanitary Certificate.

When Plant Passports are required, we obtain them from our Ministerio de Agricultura, Pesca y Alimentación (Ministry of Agriculture, Fishery and Food).

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

To obtain Phytosanitary Certificates we request them electronically at the webpage <https://servicio.mapama.gob.es/cexveg> of the Phytosanitary Inspection System of the Ministerio de Agricultura, Pesca y Alimentación (Ministry of Agriculture, Fishery and Food).

Import Permits are obtained from the webpage https://sede.magrama.gob.es/portal/site/se/ficha-procedimiento?procedure_id=242&procedure_suborg_responsable= of the same Ministry. The Import Permit is requested electronically and received by email.

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

n.a.

Box 3.3.4.A. Germplasm Supply

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

We usually provide 35 seeds per accession, both for allogamous and autogamous crops. In case of crops with big seeds (bean, broad bean, *Cucurbita* genus) we provide 20 seeds.

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

Yes

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

Under special circumstances we can deliver more than the number of seeds indicated above (specific contracts with seed companies/other genebanks for regeneration trials).

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.

The internal system is based on Access and it is used by the genebank staff. There is an online publicly searchable database with available passport and characterization data accessible from the webpage of the COMAV (<https://www.comav.upv.es/>), maintained by the Bioinformatics Group of the COMAV. Passport data are also accessible from the National Inventory (http://webx.inia.es/web_inventario_nacional/).

The internal system includes passport, characterization, images, storage, distribution, visits and viability data.

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.

We handle passport, characterization, material distribution, visits to the genebank, history of regeneration for each accession and viability of seeds.

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

In the internal databases of the genebank there are more detailed information about availability, viability, images, storage and visits to the genebanks.

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).

We send data electronically, mainly as Excel files.

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

Technical support for maintenance of the hardware is provided by the Information Systems and Communications Area of the Polytechnic University.

The documentation system based on Access has been developed by our curator (J.V. Valcárcel) in collaboration with other staff members of the genebank (J. Torres) and researchers of the COMAV (J. Cebolla). The maintenance of the specific documentation system of the genebank is made by the curator.

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

Back-up of the database content is made monthly. Data are backed up on external hardware.

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

n.a.

Box 4.2. Information Exchange

IE1 – Please describe how you make your passport data available to users (i.e. as hard copy; via the internet; other?).

We send data electronically, mainly as Excel files.

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).

Our data are not available as machine-to-machine web-services.

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

Part of our data is available to EURISCO. We provide our data to the Spanish National Inventory and the Spanish National Focal Point provides them to EURISCO. Intervals are decided by our National Focal Point.

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

n.a.

IE5 – Describe the kind of information you distribute together with the germplasm to persons that request germplasm.

Please consider the following data types: Passport, Characterization; Evaluation, and/or Germplasm management data (e.g. viability percentage; protocols followed for routine operations; etc.

We provide passport data.