

Report of the Peer Review of the COMAV Genebank

(February 7th and 8th 2019, Valencia, Spain)

Introduction

To assure sufficient food supply to the growing world's population, Plant Genetic Resources (PGR) need to be conserved and made available to crop research, plant breeding and farmers, now and in the future. The UN Sustainable Development Goal (SDG) 2.5 recognises this in calling for the maintenance of genetic diversity.

But the task of conserving and providing access to PGR is huge, and no single genebank or country can do it alone. Instead, it is a Global Effort in which different actors have to contribute. Many research institutions related to plant breeding started genebanks, and most countries have a national genebank or network of genebanks often in connection with national breeding programmes. To be considered part of the Global Effort a genebank should have adopted two principles: 1 – the material should be properly conserved and 2 – the material should be accessible.

Within Europe, genebanks are supported to implement these principles by the European Cooperative Programme for Plant Genetic Resources (ECPGR) and more specifically its initiative AEGIS, that tries to create a network of collections and facilities that together optimally conserves PGR in Europe and make it available to users. To streamline the conservation activities in Europe over different domains (plant, animal and forest) ECPGR cooperates in the EU GenRes Bridge project, that also looks for ways to support GR conservation, either by policies or protocols.

In the framework of ECPGR/AEGIS, and with the support of Genres Bridge, a system of peer review has been set up aiming at improving the quality of European genebanks by simply having the experts of these genebanks visit each other in their genebanks, giving full transparency about the facilities and protocols, and having discussions about these.

A pilot of these Genebank Peer Reviews is being organised in the first half of 2019, involving the genebanks of COMAV (Valencia, Spain), IHAR (Radzikow, Poland) and WUR-CGN (Wageningen), focussing on the seed collections.

The first of the reviews was held February 7th and 8th, 2019 in Valencia, Spain.

Organisation

The review was organised by María José Díez and José Vicente Valcárcel (respectively the director and curator of the genebank), who arranged accommodation, meeting rooms, local transportation and everything else to allow the review to function optimally. They had also prepared the AEGIS Genebank Manual for the COMAV Genebank (based on the template prepared by AEGIS). The Manual proved an excellent starting point for the review.

On Wednesday February 6th the genebank managers Wieslaw Podyma (IHAR genebank, Radzikow, Poland) and Theo van Hintum (CGN genebank, Wageningen, Netherlands) arrived, and the review took place on Thursday the 7th and the morning of Friday the 8th. During these days the reviewers visited the genebank facilities, heard presentations and talked to COMAV staff members. At the end of the Friday morning, the reviewers presented and discussed their first impressions to the hosts (María José Díez and José Vicente Valcárcel) and the director of COMAV (Jaime Prohens).

The week after the review visit the reviewers compiled this report, that was fact-checked by the hosts, amended and finalised by the reviewers.

Observations, conclusions and recommendations

The reviewers are aware of the fact that a one and a half day review is not sufficient to make a solid analysis of an organisation, its facilities and procedures, but believe it is enough to present general observations, draw some preliminary conclusions and formulate some recommendations.

Main impression

The COMAV Genebank is a small organisation with very committed and knowledgeable staff members (2 permanent and 3 additional) conserving an important vegetable PGR collection (13901 accessions). The setting in the Institute for Conservation and Improvement of Valentian Agrodiversity (COMAV) which is part of the Polytechnic University of Valencia is perfect, giving access to all required technology and facilities.

The material is conserved at suboptimal 4°C and the regeneration capacity is insufficient. The small size of the operation makes it difficult to meet the increasingly complex demands that PGR conservation makes. However, given the limited capacity, the COMAV Genebank is remarkably efficient. Its collaboration in EU and other projects shows the good reputation, also internationally.

Organisation

The COMAV genebank is part of a large and complex structure of Spanish genebanks managed by the Centro Nacional de Recursos Fitogenéticos (CRF, Madrid). The COMAV Genebank is, with the genebank of the Centro de Investigación y Tecnología Agroalimentaria (CITA, Zaragoza), the main actor in the field of vegetable PGR in Spain. However at least ten other organisations seem to be involved in this 'Super Node'. Although this review did not concern the Spanish PGR network, the impression could not be avoided that this structure cannot be very effective, and will result in redundancy of material, duplication of activities and, most importantly, genebanks without the critical mass needed to properly act as a genebank.

The COMAV genebank is at this critical mass for a genebank and its dependency on the two permanent staff members is very high, making it vulnerable. Given the setting and physical facilities (storage rooms) an increased role in the CRF network would make sense.

Recommendation 1: Possibilities for expansion of the mandate, budget and staff of the genebank should be sought to better be able to meet future challenges and avoid current dangers.

Legal Basis

Continuity is vital for conservation activities. Although at a national level the activities of CRF has a proper legal basis, the role of the nodes in the PGR network don't seem to be assured.

Recommendation 2: A legal basis of the genebank should be created to assure continuity of its PGR conservation activities.

Facilities

The COMAV genebank has access to remarkable spacious seed storage facilities of which only a fraction is used. Only the +4°C storage rooms are used (seeds in glass jars with silica gel); the rooms designed to function at -20°C can currently not be used due to technical problems.

Storing seed at +4°C is suboptimal, and the generation span is much shorter than needed. To deal with this, all accessions are regenerated every 20 years provided the capacity is available. Storing seed at -20°C would very much reduce the loss of seed viability and thus reduce the need for regeneration due to loss of seed viability.

Recommendation 3: The -20°C storage facility should be repaired and used for long term storage of the seed samples.

This could be realized in a project that would include the repair of the facilities, the packing and sealing of a part of each seed sample in one or more laminated aluminium bags. The project would also allow complete safety back-up of the collection (see later recommendation).

The +4°C storage rooms are effective, and back-up power supply is available. However, there is no monitoring system and failure of the cooling facilities might go unnoticed for several days.

Recommendation 4: A monitoring / alarm system for failures of the cooling equipment should be installed.

The capacity to regenerate accessions is limited and given the storage conditions, and thus the regeneration needs, insufficient. A solution is needed since at the current regeneration capacity (200 accessions per year) it would take 65 years to regenerate the collection, not even considering seed depletion due to use.

Collection Management

The COMAV genebank maintains its collections well. The staff involved has extensive knowledge of the crops it conserves, and has a good national and international network.

The staff is aware of all relevant ABS and phytosanitary rules and regulations, genebank standards, etc.

The only major concerns are the lack of long term storage (see recommendation 3), the shortage of capacity to regenerate, the incomplete data on germinability and the incomplete safety back-up.

The documentation seems to store all relevant information, however, creating better overviews that allow better planning and decision support would be helpful.

Recommendation 5: Better tools for decision support regarding collection management should be created providing easier overviews of the age and amount of seeds and their germinability and allowing better planning of regenerations, safety backup, etc.

Seed viability is not monitored; only since 1991 the initial viability is determined based on 50 seeds. For a large and older part of the collection, no germination has ever been determined (although feedback in this regards of users of the collection is taken seriously). In case the generation span is extended by using the -20°C storage facility a germination monitoring system will be required.

Recommendation 6: For accessions lacking information about the quality of the seeds, it should be gathered.

Recommendation 7: Steps should be taken to assure complete safety back-up of the collection, and possibly triplication in Svalbard.

Access and Distribution

The visibility of the material in the collection to the world is limited, it is difficult to find the data. The collection is presented briefly on the via COMAV and National Inventory websites, and passport data are included in EURISCO and Genesys. It could be presented much more prominently at the COMAV website; however this would result in higher use and quicker seed depletion.

The collection is used considerably, over the last 6 years annually more than 3000 samples were distributed, however this primarily concerned internal (COMAV) use, use in collaborative (EU) projects and use by Spanish requestors; there appeared to be very few uses by foreign regular users.

The SMTA is used, but not for all shipments. MTAs other than the SMTA are used only for farmers and in some EU projects.

Recommendation 8: The use of the SMTA as a basis of distributing genebank material should be extended to all shipments except shipments of material for direct use in Spain.

The material doesn't undergo any phytosanitary tests prior to storage. Tomato and pepper seeds are disinfected before being stored in the cold chambers. When required the specific tests are performed before shipment to countries requiring such tests (very few per year).

Documentation system

The current documentation system is pragmatically designed to store all required data. As such it functions well. However the system is not documented. As a result the interpretation of columns might change and the meaning of codes might be forgotten.

Recommendation 9: A simple data dictionary should be created documenting the meaning of the various columns in tables and the codes used in these tables.

Also the backup of the system is done pragmatically (make a copy once in a while and take it home). UPV IT staff might have simpler solutions on the shelf.

A considerable amount of phenotypic data and photos are available on hard disks, but not on the web. This task is in progress: COMAV leads a National Project funded by INIA which aim is (among other objectives) to make available all passport, phenotypic and images of all the Spanish tomato collection. In less than one year the project will be finished and all this info will be available.

Recommendation 10: An inventory of currently 'un-accessible' data should be made, and a plan to make it accessible should be created and when possible implemented.

Final conclusion

The COMAV Genebank is a well organised operation, floating on the commitment of its staff members. The operation is, however, clearly too small to sustainably manage its current collections, but certainly has the potential, with limited investment and additional capacity, to become an important and reliable genebank.

Final remarks

The reviewers were positively impressed by the transparency given by the hosts during the review; all information was shared, everybody spoke openly. This was very much appreciated, as was the general hospitality and positive atmosphere during the visit.

May 15th, 2019

Theo van Hintum and Wieslaw Podyma