New-AEGIS Genebank Peer Review

Genebank reviewed:	CGN-Plant, Wageningen University and Research, Wageningen, Netherlands.
Date:	18-19.03.2025
Participants CGN-Plant:	Erik Wijnker, Theo van Hintum, Frank Menting, Lana de Bruijn, Rik Lievers, Lynn Vorstenbosch
Reviewers:	Ana Maria Barata (Banco Português de Germoplasma Vegetal) Agnese Gailīte (Latvian Genetic Resource Centre), Dainis Ruņģis (Latvian Genetic Resource Centre)

BACKGROUND

The "Reinforcement of the AEGIS Quality System and EURISCO Data Coverage" (New AEGIS) project aims to enhance the European Genebank Integrated System (AEGIS) and improve the accessibility of plant genetic resource (PGR) data through the EURISCO database. This initiative aligns with the priorities of the European Cooperative Programme for Plant Genetic Resources (ECPGR), focusing on the sustainable conservation of unique European germplasm and the efficient sharing of related data. As part of the AEGIS quality system (AQUAS), peer reviews are conducted to ensure transparency, promote mutual support, and provide valuable feedback on genebank practices. These reviews foster continuous improvement, ensuring that genebanks uphold high operational standards and contribute to a robust, accessible European Collection. Reciprocal peer reviews are carried out by groups of three genebanks, and this report is the result of a review conducted by a group including the Latvian Genetic Resource Centre, the Centre for Genetic Resources in the Netherlands, and the Banco Português de Germoplasma Vegetal in Braga, Portugal.

VISIT ORGANISATION

The second visit in this peer review cycle was organized by CGN and took place at CGN-Plant, Wageningen University and Research, Wageningen, Netherlands. CGN-Plant is the national gene bank responsible for conserving plant genetic resources in the country. Established in 1985, it now houses 23 545 plant genetic resource accessions from 33 crop collections, originating from 159 countries. The focus is on vegetables and wild potatoes, and access to the entire collection is guaranteed under the terms of the sMTA.

Erik Wijnker provided a recently updated Operational Genebank Manual based on the AEGIS template, which served as a helpful starting point.

Reviewers arranged their own travel to a hotel in Wageningen, after which Erik Wijnker provided transport to and from the CGN campus.

The visit began with an introduction by Erik Wijnker, who provided an overview of the genebank, the organizational structure and funding basis, as well as activities both within the core mandate of the genebank as well as associated activities that are facilitated by various collaborations. Theo van Hintum then presented the quality management system (QMS) implemented at CGN, and led a discussion about the use of genebank metrics to monitor the internal functions of the genebank as well as to assess the impact on the user community using distribution statistics. Following these introductory presentations, the review focused on visiting the seed storage facilities, including cold rooms, seed drying, -cleaning and -testing laboratory, as well as presentations and discussions with several genebank staff. These visits offered sufficient opportunities to engage with staff and gain valuable insights into the operations of CGN-Plant. The morning of the second day was also dedicated to additional presentations and discussions on various aspects of the genebank. The review concluded with a presentation by the reviewers, who shared their observations and recommendations with Erik Wijnker and Theo van Hintum, followed by a discussion about the visit and the responsibilities and expectations placed on genebanks in Europe.

REVIEW

The CGN is focused on plant genetic diversity that is important for Dutch breeding companies, and due to the well documented and freely available collection, material stored in the genebank is requested from all over the world. The genebank has a large potential to contribute to world food security, and is an important source of germplasm for breeding and research. Accessions are defined according to strict definitions (i.e. adding value (diversity) to the collection and availability). Other material that does not meet these strict definitions is either placed in 'special collections' (which are often available under non-sMTA conditions), or held until a decision is made on the status of the sample.

The CGN is an exceptionally well-organized genebank, with good facilities and qualified and enthusiastic staff. A new building to house the collection is being planned, which will increase the capacity

Organization, management and funding

The core activities of CGN-Plant are funded by 5-year agreements with the Ministry of Agriculture, Nature, and Food Quality, which contracts CGN to fulfill "statutory tasks" mandated by the Ministry of Agriculture, Fisheries, Food Security and Nature and obligations placed on the Netherlands government by various international treaties.

The CGN has significant flexibility regarding the use of the funds allocated under the contract with the ministry, operating as a separate business unit in WUR-Wageningen Plant Research. and can therefore utilize a business-like approach to fulfill the required activities (e.g. outsourcing of tasks).

The implementation of a quality management system that has ISO 9001 certification ensures that the organization and management of the genebank are well documented, and regularly updated to improve procedures.

The CGN also has staff dedicated to a wide range of aspects in addition to the core activities of seed conservation and distribution, including policy and research areas.

CGN has close collaboration with Dutch breeding companies and a significant proportion of core genebank activities such as seed regeneration is done by these companies as well as by other international partners (genebanks, research institutes) using protocols developed by the CGN. Previously, germination tests were also outsourced, but currently, this is largely being done by CGN staff in-house.

> **Recommendation 1:** Outsourcing of tasks can lead to loss of expertise within the genebank, care must be taken that knowledge is maintained within CGN, as renewing expertise can take a long time once it is lost.

The genetic resource collection

The CGN collection is focused on vegetables and wild potatoes. There is a plan to significantly increase the size of the collection to bolster the status of CGN as a major international genebank. This involves an increased emphasis on both national and international collecting missions as well as identification of material currently being held elsewhere, often in sub-optimal conditions. The CGN collection is expanded by joint regenerations with these 'twinning partners' (foreign genebanks with backlogs are supported in regeneration and material is shared). There is little emphasis on clonal/vegetatively propagated material.

A lot of time and effort has been invested in optimizing and increasing the quality and availability of the collection over the past decades, ensuring that all accessions are of the highest possible quality and are available under the terms of the sMTA. All accessions are safety duplicated at partner genebanks, and >80% is triplicated in the Svalbard Global Seed Vault.

Material that has been acquired during collecting missions is routinely regenerated prior to being placed in the collection, and in some cases the original seed sample is not stored. The number of seeds collected during the missions are not routinely recorded in the database, a record is made if an insufficient number of plants (according to CGN protocols) are available during seed regeneration.

> **Recommendation 2:** It is important to maintain a 'steady state' of the genebank while expanding collection size and adding new species.

> **Recommendation 3:** Instructions and documentation protocols for collecting missions may be improved. Documentation of the number of seeds collected can be an indicator of the potential genetic diversity within the original seed sample.

Documentation and information

CGN uses a custom database for documentation and provides a web interface for searching and ordering of seed accessions. The public interface also has an option to create a core selection to limit the number of selected accessions. For most accessions, standardized characterization and evaluation data is on-line searchable, but all the full datasets are available for download. The reviewers did not have any specific recommendations about improving the documentation and information system or protocols.

CONCLUSION

The genebank staff are very motivated and focussed on the message of conservation for future generations and immediate access to material. This can provide inspiration to other genebanks to ensure that the basic 'core' activities (seed conservation and distribution) are effectively fulfilled. This strict prioritisation of genebank activities can guide other genebanks, however in many cases this may be hampered by insufficient autonomy in terms of decision making and setting of priorities (as well as funding).

The CGN is obviously a well-managed genebank that can provide an example for other genebanks in Europe and worldwide. The CGN is focused on crops that are of importance to the Dutch agriculture and breeding industry, and tries to avoid duplication of material held in other genebanks. 'Core' genebank activities are strictly defined, which enables the CGN to provide high quality material and information, avoiding situations where material is listed in public databases and included in the MLS, but is in practice not available. By definition, this review strictly focussed on *ex situ* seed conservation and distribution, and therefore the wider roles of genebanks in plant genetic resource conservation and use (e.g. public awareness, *in situ* conservation etc) were only briefly touched upon during the final discussion. Given that the CGN has been ISO 9001 certified since 2004, and the expertise and competence of staff is high, the review did not identify any major recommendations on improving the operation of the genebank.

ACKNOWLEGEMENT

The reviewers would like to thank the CGN staff for their availability and their willingness to present the genebank's activities in a positive and open way. The reviewers experienced a welcoming environment and appreciated the warm hospitality.