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**International Treaty
on Plant Genetic Resources
for Food and Agriculture**

**INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

**SIXTH MEETING OF THE SCIENTIFIC ADVISORY COMMITTEE
ON THE GLOBAL INFORMATION SYSTEM**

Rome, Italy, 7–8 May 2025

Report from the European Cooperative Programme for Plant Genetic Resources

Note by the Secretary

This document contains the Report of the European Cooperative Programme for Plant Genetic Resources (ECPGR) concerning activities in the field of documentation and information of PGRFA. The report has been prepared for the Scientific Advisory Committee on the Global Information System.

The report has been submitted by the Secretary of the ECPGR in connection with Agenda Item 4 and is presented in the form and language received.

Report on ECPGR activities in the field of Documentation and Information of PGRFA, for the attention of the Scientific Advisory Committee on the Global Information System, Rome, Italy, 7-8 May 2025

Status of EURISCO

EURISCO, the European Search Catalogue for Plant Genetic Resources, is gathering data from the National Inventories of European countries through a network of National Inventory Focal Points (Kotni et al. 2023¹). EURISCO is a product of the European Cooperative Programme for Plant Genetic Resources (ECPGR), it is funded through the ECPGR budget, and it is governed by the ECPGR Steering Committee, guided by the advice of the EURISCO Advisory Committee.

In May 2023, the ECPGR Steering Committee agreed that EURISCO should continue to be hosted by IPK Gatersleben, Germany. An agreement until the end of 2028 was therefore signed between Bioversity International on behalf of ECPGR, and IPK, that will continue hosting and further developing the EURISCO information system and the underlying network.

As of April 2025, the number of *ex situ* accessions documented in EURISCO has reached 2,106,681, provided by 419 institutions from 43 countries. The number of accessions has grown in the last five years by an average of ca. 16,000 accessions per year. Phenotypic data are available for ca. 92,000 accessions from 21 countries, and these have grown in the last five years by an average of ca. 1,000 accessions per year.

Key information about European accessions is provided by the EURISCO statistics, including the number of accessions that are part of the Multilateral System (currently 436,563), the number of accessions that are part of the European Genebank Integrated System AEGIS (currently 119,475), the number of accessions to which a Digital Object Identifier (DOI) was assigned (currently 300,820). All passport information gathered in Europe through the EURISCO network is fed into GENESYS, thus providing to GENESYS nearly 50% of its data.

Phenotypic data in EURISCO

Since 2016, National Inventory Focal Points can make non-confidential phenotypic data available in EURISCO through a standardized and recently simplified exchange format. In whatever form these data have been generated (independently from the standards and measurements used), they can be exported via this common exchange format, with a minimum of data transformation. EURISCO has thus become a large repository of completely unstandardized but interpretable scores. Users need to screen and analyze the data based on the species and traits of interest.

A major effort to generate increasingly standardized data and provide them through EURISCO has come in recent years from the Horizon project AGENT² and the ECPGR Evaluation Network EVA³.

¹ <https://doi.org/10.1093/nar/gkac852>

² <https://agent-project.eu/>

³ <https://www.ecpgr.org/eva>

The AGENT project has developed data management guidelines and tools which enabled the collection and curation of large numbers of historical phenotypic datasets, highlighting their potential value in informing genebank management priorities. These data, including additional ca. 1 million data points for 66,000 accessions have been made available in a public data portal and will eventually be integrated in EURISCO.

In the EVA initiative, large groups of stakeholders, organized in public–private partnerships, have evaluated genebank accessions of several crops in multilocation trials across Europe. Phenotypic data have been deposited into the EURISCO-EVA Information System, providing a dedicated platform for partners (genebanks, breeders, researchers) to upload and share phenotypic data in a standardized manner. Since 2021, over 600,000 phenotypic data points on more than 6,300 accessions from 8 crops, gathered across 450 experiments in 33 countries, have been generated. These data are curated with metadata on traits, methodologies and environmental conditions, improving their interoperability (Kumar et al., 2024)⁴. At the end of a 3-year embargo period, data are uploaded on EURISCO. These data will add up to a total of about 2.7 million phenotypic data points for 92,000 accessions, comprising approximately 4,000 experiments.

In situ crop wild relatives inclusion in EURISCO

A German-funded project working for the extension of EURISCO for *in situ* crop wild relatives (CWR) data (2021-2025)⁵ has focused on the 'use potential' of European *in situ* populations. The project developed a set of principles regarding the inclusion of CWR data in EURISCO (Hintum and Iriondo, 2022⁶), which were eventually validated and are recommended for practice by all European countries.

Only data related to germplasm that could potentially be made available to users should be entered in EURISCO. Datasets included in EURISCO should refer to 'actively conserved' populations, in a broad sense. Suggestions and support for the development of national inventories of priority CWR populations were provided. Sets of *in situ* population data to be gathered in EURISCO have been defined through a list of EURISCO-specific descriptors⁷.

Following the preparation of EURISCO to receive this new set of data, *In situ* CWR National Inventory Focal Points have been identified by a group of pilot countries. So far, data have been uploaded for 6,384 populations by 11 countries (Albania, Bulgaria, Cyprus, Germany, Italy, Lithuania, the Netherlands, Poland, Portugal, Romania and the United Kingdom). Users can find in EURISCO either the institution directly managing the *in situ* populations or the contact details for a liaison institution. This approach makes it possible to request access to the *in situ* material.

⁴ <https://doi.org/10.46265/genresj.IHXU5248>

⁵ <https://www.ecpgr.org/working-groups/crop-wild-relatives/cwr-in-eurisco>

⁶ <https://www.ecpgr.org/resources/ecpgr-publications/publication/principles-for-the-inclusion-of-cwr-data-in-eurisco-2022>

⁷ <https://www.ecpgr.org/resources/ecpgr-publications/publication/descriptors-for-uploading-in-situ-cwr-passport-data-to-eurisco-2022>

Development of on-farm landrace inventories and link to EURISCO

The ECPGR On-farm Conservation and Management Working Group has recently made progress, largely through the Horizon project 'Farmer's pride' (2017–2021), about inventorying on-farm landraces in Europe, with nearly 20,000 on-farm landraces documented from 14 European countries (Raggi et al. 2022⁸). The '*In Situ* Landraces Best Practice Evidence-Based Database' provides access to evidence-based information on the benefits, opportunities and practices of landrace cultivation, including over 100 examples of successful landrace cultivation across Europe⁹. Despite these achievements, it has been acknowledged that compiling and maintaining an inventory of germplasm managed on farms is complex and challenging to sustain over the long term. This difficulty is compounded by the absence of a strong and stable network of maintainers willing to provide and regularly update the necessary data. Furthermore, the value of such an inventory for users could be questionable, as access to the material might only be ensured through depositing samples in *ex situ* genebanks. On the other hand, knowledge of the existing on-farm diversity, in the form of 'landrace inventories' (lists of landrace names), would be especially valuable at the national level for monitoring, promoting and managing on-farm diversity, potentially through incentives. Through a dedicated ECPGR-funded pilot project, 'ABC Mediterranean landraces' (2025–2027)¹⁰, the On-farm Conservation and Management and the Documentation and Information Working Groups will collaborate to create lists of existing landrace names starting from southern European countries. An initial overview will be created in EURISCO of landraces maintained in these countries under on-farm conditions. To this end, it is planned to provide a list of accession names, genus and species for each pilot country. This list will be based on the inventory of the respective country, but will not go down to the accession level. These lists will be made searchable in EURISCO and make it possible to identify material that is also preserved in *ex situ* genebanks based on matching landraces' common names with genebanks' accession names. This virtual connection between national inventory lists will enable monitoring the level of *ex situ* conservation of on-farm material and support gap analysis, identifying which landraces still need to be secured in genebanks.

Plans for an ordering system in EURISCO

It is currently not possible to directly order genetic resources via EURISCO. This option was never introduced since it was considered unrealistic for many National Inventories to keep it up to date, and the likelihood of numerous unsuccessful order attempts was considered too high. On the other hand, all the accessions that are part of AEGIS should by default be available under the Standard Material Transfer Agreement (SMTA). The EURISCO team is planning to develop an ordering system for AEGIS accessions. A dedicated application programming interface (API) will be provided to the genebank information systems to redirect specific orders. These orders will be received by genebanks in the same way as any other order submitted outside of EURISCO, and will be processed through their regular

⁸ <https://doi.org/10.1016/j.biocon.2022.109460>

⁹ <https://www.ecpgr.org/in-situ-landraces-best-practice-evidence-based-database>

¹⁰ <https://www.ecpgr.org/working-groups/on-farm-conservation/abc-mediterranean-landraces>

ordering system (possibly including a click-wrap SMTA approval, etc.). This procedure would only be suitable for genebanks endowed with an autonomous ordering system, or which are ready to invest in establishing one. Alternatively, EURISCO will generate an email to be sent to the suitable address where the genebank wishes to receive this type of order.

DOIs

ECPGR acknowledges that Digital Object Identifiers (DOIs) are essential to uniquely and permanently identify accessions, thus allowing the extraction of all possible information related to each accession, including its history, derivation, duplication, past use, genotypic and other associated data. There is agreement that every accession should have a DOI assigned and it is constantly recommended to assign DOIs to genebank accessions. EURISCO is offering a service, in liaison with the ITPGRFA Secretariat, to assign DOIs to the accessions upon the request of countries and on behalf of the genebanks maintaining the material. This service works very well and with minimum effort. However, only a few countries have decided to take advantage of this service or have autonomously obtained the DOIs for their collection. Armenia, Azerbaijan, Romania, Italy and Slovenia have used this service.

Improving data quality through training

The EURISCO team regularly organizes virtual or physical training workshops for the National Inventory Focal Points to guide them about data exchange standards and data uploading to EURISCO. Efforts will be made to enhance training with a view to improving data management practices, data quality and data FAIRness¹¹. A series of webinars on various topics (meaning and choice of descriptors, scoring methodologies, etc.) are being planned, either with the purpose of training or to disseminate the value of the data analyzed from the genebanks.

Role of EURISCO and its evolution

The EURISCO Advisory Committee recently discussed the future role of EURISCO. Historically, EURISCO was, together with SINGER (CGIAR), the first aggregated PGR information system. Subsequently, SINGER developed into GENESYS, which expanded its scope to the entire world, using EURISCO as the source of European regional data. At present, GENESYS is the most complete, well-maintained and accessible PGR aggregator information system, which now includes CGIAR collections, EURISCO, USDA and various other (inter-) national genebanks. In the long run, it will make sense to further integrate EURISCO with GENESYS or use the same software. However, it will be important to maintain the well-established and successful brand name EURISCO to guarantee continuing data flow from European National Inventories. Moreover, while the web interface can be replaced, the level below, which is the aggregated data, including phenotypic data, obtained from European countries, is not replaceable. The EURISCO backend infrastructure remains necessary for integrating, curating and cleaning data. However, the interface could be technically merged with GENESYS, without eliminating the EURISCO branding as a major data supplier. All the

¹¹ FAIR: Findable, Accessible, Interoperable, Reusable. See <https://doi.org/10.1038/sdata.2016.18>

possibilities that GENESYS could provide to avoid duplication of effort will be explored to free up capacity in the medium term and more strongly focus activities on the network behind EURISCO and the gradual improvement of the quality of the integrated data.

PRO-GRACE analysis and perspectives for the future European information system

The Horizon project PRO-GRACE (2023–2025) (Promoting a Plant Genetic Resource Community for Europe)¹² acted as a preparatory action towards the development of a European Research Infrastructure on PGR (GRACE-RI). Within the project's 'Information System Work Package', an analysis was made of the current status, and suggestions were proposed for future improvements of the European Information System on PGR.

Gaps and limitations of EURISCO were analyzed and a strategy for interfacing with relevant disparate information systems was developed. The target objective, as expressed by the European PGR Strategy, is for EURISCO to further establish itself as a trusted repository in the arena of European and global open-access databases. A systematic inventory was made of intra-country gaps, pinpointing specific regions and institutions whose PGR data are not yet represented in EURISCO. Data quality limitations have been identified in the form of update gaps, limited adoption of Permanent Unique Identifiers (only 14% coverage), taxonomic discrepancies, absent or incorrect geographical coordinates and the underrepresentation of phenotypic data (only 4.4% of EURISCO's holdings have any characterization and evaluation data associated with them). Factors contributing to PGR information gaps and limitations include a lack of national strategies and legal frameworks, poor inter-institutional collaboration, absence of prioritization and corresponding fund allocation, absence of quality assurance practices, variable technical capacity for data management, and limited use of standardized software. To gradually address these gaps, ECPGR initiatives focus on strengthening national coordination, promoting quality standards, providing specialized training and supporting or coordinating collaborative projects and initiatives such as the Evaluation Network EVA and EU-funded projects.

EURISCO operates within a global ecosystem of genetic resources information systems. It is the European node of the worldwide GENESYS information system and a vital part of the FAO's Global Information System (GLIS) on PGRFA. In this context, interoperability between platforms is crucial and achieving seamless data exchange and linking remains a challenge.

A particularly well-suited approach would be a hybrid federated model, in which EURISCO retains its function as a principal PGR data aggregator and discovery hub while interlinking with specialized repositories that focus on deeper curation and analytics. In this approach, detailed data remain distributed at source repositories, and are virtually accessed or fetched on-demand via APIs. Through increased use of DOIs and BioSample ID, and the adoption of appropriate APIs, such as BrAPI, it will be possible to link each *ex situ* accession or *in situ* population with any type of related information conserved in existing domain-specific databases of multi-omics information (e.g. genomics, transcriptomics, proteomics, metabolomics). Similar links can be established with complex workflows combining phenotypic observations, whether from semi-automated sensors, advanced imaging, or high-

¹² <https://www.grace-ri.eu/pro-grace>

throughput field evaluations, producing dense time-series datasets of considerable size. Environmental, climatic and agroecological data can also be federated by indexing key reference metadata and enabling on-demand retrieval.

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