

ANNUAL PROGRESS REPORT

2021



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ECPGR IN 2021 – HIGHLIGHTS

2021 – Second COVID-19 year

After 2020, 2021 has also been a year of challenges for the whole world and the COVID-19 pandemic continued to affect our work on multiple levels, even though we have adapted to new working conditions. The ECPGR Secretariat has largely continued to work from home, although the new Headquarters of the Alliance of Bioversity International and CIAT have opened in the centre of Rome in May 2021, completing the move out of Maccarese. Access to the office has been regulated with limited occupancy for a large part of the year. The ECPGR Secretary switched to working permanently from home in Lombardy, Northern Italy. Meetings for projects, grant activities and Working Groups were again either postponed or held through video conference. A number of activities could not proceed as planned due to lockdown measures. Progress was made in various areas, with the completion of the Genetic Resources Strategies for Europe, as part of the GenRes Bridge project, the continued progress of the EVA Networks and the approval of a new German-funded project for the transfer of *in situ* crop wild relatives' data to EURISCO, as documented in this report. A 'Jubilee video' was produced for the fortieth anniversary of ECPGR and a communication specialist was hired.

Launch of Genetic Resources Strategies

- The GenRes Bridge project, coordinated by the European Forest Institute, Finland, and involving the three European networks (ECPGR, EUFORGEN and ERFP), completed and published the *Genetic Resources Strategy for Europe*. Endorsed by the Steering Committees of the three networks, the Strategy provides a framework for genetic resources over the next decade, and was complemented by three domain-specific strategies on animal, forest and plant genetic resources. The *Plant Genetic Resources Strategy for Europe* was finalized as a joint effort of an ECPGR drafting team.
- The strategies were presented to the European Commission and genetic resources stakeholders during a launch event on 30 November 2021 in Brussels, Belgium.

European Evaluation Network (EVA)

- After the establishment of the ECPGR European Evaluation Network (EVA) in 2019 with financial support from the German Federal Ministry for Food and Agriculture, membership of the five crop-specific EVA networks on carrot, lettuce, pepper, maize, and wheat and barley was extended to a total of 92 partners from 28 countries.
- The development of the EURISCO-EVA intranet was one of the major milestones accomplished in 2021. This database was designed to provide network partners access to all relevant experiment metadata and collected phenotypic data, facilitating analyses and compatibility with the EURISCO database, which should host the phenotypic data after the end of the project's embargo period.
- Evaluation activities were carried out by all networks. Data for first sets of barley, wheat and durum wheat accessions, mainly for biotic stress responses, were collected from more than 70 evaluation sites across Europe. Multiplications of wheat and barley for an extended set of evaluations were started in the framework of the AGENT (Horizon 2020) project, also involving a farmer's network coordinated by Rete Semi Rurali, Italy. Field evaluations continued on European carrot accessions and landraces, collecting data for agronomic traits as well as biotic stress responses. In-depth field trials were made for selected lettuce and pepper accessions. Maize evaluations started with the initial characterization of a first full set of accessions, from which a subset was selected for the production of hybrid populations in winter nurseries and in-depth evaluation of both landraces and hybrids in 2022.

- Genotyping activities proceeded for all networks, using different approaches for the different crops (SNP arrays, genotyping-by-sequencing, single primer enrichment technology and whole-genome resequencing).

Activity Grant Scheme

Two new activities were selected by the Executive Committee in 2021:

- BiDifferent (On-farm conservation and management, and Wheat Working Groups)
- FRUITTREEDATA (*Malus/Pyrus* and *Prunus* Working Groups)

New German-funded project for *in situ* CWR data in EURISCO

- A proposal submitted by the ECPGR Secretariat for the “Extension of EURISCO for Crop Wild Relatives (CWR) *in situ* data and preparation of pilot countries’ data sets” was accepted for funding by the German Federal Office for Agriculture and Food, with a budget of €247,318 over three years.
- The project intends to endow the European region with a centralized, public and web-searchable inventory of passport data for *in situ* CWR priority populations that can in principle be made accessible to users. The project will also provide capacity building to a pilot group of European countries. Partners include Cyprus, the Czech Republic, Germany, Lithuania, the Netherlands, Portugal, Spain and the United Kingdom.

AEGIS

- Slovenia contributed accessions to AEGIS for the first time.
- An opinion paper on AEGIS was published in the journal *Plants*:
Van Hintum T, Engels JMM, Maggioni L (2021). AEGIS, the Virtual European Genebank: Why it is such a good idea, why it is not working and how it could be improved. *Plants* 10, 2165. <https://doi.org/10.3390/plants10102165>

EURISCO

- The intranet interface supporting upload mechanisms for National Inventories was revised making it more visually appealing and making the passport data upload purely web-browser dependent.
- A general revision was made of the public EURISCO web application with technological updates and improved functionalities. A prototype of the new web application was presented at the end of 2021 to gather feedback from the users.

New Staff at the ECPGR Secretariat

- Nora Capozio joined the Secretariat in November 2021 as Editing and Communications Specialist, while we bade farewell to Elinor Lipman, who retired in March. Vanessa Bryant also completed in December 2021 her assignment as temporary administrative support staff.

1. ECPGR STRUCTURE AND MODE OF OPERATION IN PHASE X

1.1. MEMBERSHIP AND CONTRIBUTIONS

With the signature of Italy in April 2021, 33 countries have signed the Letter of Agreement (LoA) for Phase X membership. The list of signatory member countries is available online ([Membership webpage](#)).

Two additional countries (Belgium and North Macedonia) contributed funds for Phase X, even though they have not yet signed the LoA.

It has been made clear that Bosnia and Herzegovina (BIH) will not sign the LoA for Phase X and therefore the ECPGR budget has been reduced by €15,750, corresponding to five years of contributions from BIH.

At the same time, the ECPGR budget for Phase X has been increased by €247,318 thanks to contributions pledged by Germany as part of a project to transfer *in situ* crop wild relatives data to EURISCO.

The ECPGR budget for Phase X has therefore increased from originally €2,688,250 (agreed in May 2018 in Thessaloniki) to €4,280,517 at the end of 2021 (see details in the Financial Report 2021).

1.2. CHANGES IN NATIONAL COORDINATORS

In 2021, the following change in National Coordinators took place:

- **Norway:** Ms Linn Borgen Nilsen, Senior Adviser, Norwegian Genetic Resource Centre, replaced Ms Nina Sæther as of June 2021.

1.3. MANAGEMENT OF ECPGR WORKING GROUPS

Documentation and Information Working Group: The Terms of Reference for the position of Working Group Chair were revised and endorsed by the Steering Committee in April 2021. They are available [here](#). The function of chairing the EURISCO Advisory Committee has been de-coupled from the tasks of this WG's Chair. Stephan Weise, IPK, Germany, was selected as the new WG Chair in November 2021, replacing Theo van Hintum, CGN, The Netherlands, who had stepped down from the Chair's position on 31 December 2020.

Vitis Working Group: Thierry Lacombe (INRAE, France), stepped down from the position of Working Group Chair at the end of 2021, after chairing the Group for the last seven years. We thank Thierry very much for his commitment and dedication to ECPGR.

See full lists of [Working Group members](#), [Working Group members by country](#) and [Working Group Chairs](#)

1.4. SECRETARIAT

Staff changes

After more than 25 years as a Scientific Assistant with ECPGR, our colleague **Elinor Lipman** decided to take early retirement and left in March 2021. Elinor has been one of the historical pillars of the ECPGR Secretariat, ensuring the highest level of quality control and editorial support for the network's rich publication process, finalizing hundreds of reports, scientific articles, documents, flyers and information bulletins, as well as supporting countless external partners from over 40 countries to edit, amend and re-write scientific texts and helping them to follow up with their collaborative technical inputs. The massive work that Elinor carried out throughout the years has been characterized by rigorous standards of quality, consistency, accuracy and integrity, thus earning the appreciation and

esteem of colleagues and external partners and becoming a most reliable reference point. We are indebted to Elinor for her invaluable contributions to the Secretariat over the years.

A new Editing and Communications Specialist, **Nora Capozio**, joined the ECPGR team as of 15 November 2021. With an MSc in Science Communications and Mathematics, Nora brings more than 15 years' experience in providing editing and communications support to scientific organizations, including 13 years of working within an international agricultural research environment. Nora will provide editorial and web publishing support to ECPGR, as well as deal with ECPGR communication activities such as website management and communication strategy development.

Having provided part-time administrative support to the ECPGR Secretariat and EVA project and its Coordinator for more than a year, **Vanessa Bryant** left the Secretariat at the end of 2021.

New office

The Headquarters of the Alliance of Bioversity International and CIAT have moved to a new building in the centre of Rome (Aventino area) in June 2021. However, due to the COVID-19 restrictions and limited access to the office, a working-from-home arrangement for all ECPGR staff prevailed for the entire year 2021.

1.5. ACTIVITIES OF THE EXECUTIVE COMMITTEE (ExCo)

At the end of 2021, the ExCo was composed of Marianne Lefort (Chair), Vojtech Holubec (Czech Republic), Birgitte Lund (Denmark), replacing Külli Annamaa (Estonia) as of 1 February 2021, Benvindo Martins Maças (Portugal), Beate Schierscher (Switzerland), and Lorenzo Maggioni (ECPGR Secretariat, *ex officio*).

The ExCo held three main meetings in 2021:

- Seventeenth meeting, 7 May 2021, online
- Eighteenth meeting, together with ad hoc drafting team, 1 December 2021, Brussels, Belgium.
- Nineteenth meeting, 13 December 2021, online.

In 2021, the main activities of the ExCo were related to the following items:

- **Evaluation, selection and awarding of proposals submitted under the ECPGR Grant Scheme**
Proposals for the Fifth Call of Phase X were selected and awarded (see details below).
- **Appointment of WG Chairs**
- **Contribution to the preparation of the *Plant Genetic Resources Strategy for Europe***
The ExCo continued this work together with a drafting team of national coordinators, supporting the Secretariat for the drafting of the PGR Strategy.
- **Participation of ExCo members in technical meetings**
 - GenRes Bridge final meeting and launch of the *Genetic Resources Strategy for Europe*, 29-30 November 2021, Brussels, Belgium.
- **Preparation of the Mid-Term Steering Committee meeting**
The ExCo defined dates, location, draft agenda and main background documents for the meeting, which will be held in Malmö, Sweden, 7-9 June 2022. Also, arrangements for a meeting of the Working Groups' Chairs, to precede and help the preparation of the Steering Committee meeting, were agreed upon.
- **Preparation of an ECPGR position statement on Farmer's Pride**
In consultation with the Steering Committee, the ExCo prepared a statement in preparation for the final meeting of the EU project Farmer's Pride, held in June 2021. The statement acknowledged the achievements of the project towards implementing the ECPGR objectives but

as critical regarding the establishment of one single network of actors working on *in situ* CWR and on-farm conservation outside the framework of ECPGR.

2. ACTIVITIES CARRIED OUT IN 2021

2.1. ECPGR ACTIVITY GRANT SCHEME

Note: for all activities, details on the implementation and all available documents (interim and final reports, complementary data, references etc.) can be found on the respective Activity webpages. The available final reports can also be found [here](#) (for Phase IX) and [here](#) (for Phase X).

Two proposals out of three have been selected for funding in the Fifth Call in 2021 (see Table 1 below):

Table 1. Proposals approved by the ExCo under the Fifth Call of Phase X

Acronym	Title	Working Group(s)	Activity Coordinator	Budget in Euros
BiDifferent	Chances for the conservation and re-cultivation of central European Binkel (club wheat) through a nutritional and genetic differentiation towards other wheat species	<ul style="list-style-type: none"> On-farm conservation and management Wheat 	Rudolf Vögel, Germany	€32,462
FRUITTREEDATA	Improvement of Fruit Tree Data Inclusion in EURISCO	<ul style="list-style-type: none"> <i>Malus/Pyrus</i> <i>Prunus</i> 	Matthew Ordidge, UK	€29,975

See details on the web page: [Outcomes of the Fifth Call](#)

Overall, nine activities have been granted in the first part of Phase X, five of which had started by the end of 2021.

During Phase IX, 31 activities had been granted. By the end of 2021, 22 had been concluded with an Activity report and 8 reports were still pending. One activity (ImprovLoliumCol) was still ongoing. The status and/or outcomes of activities that were still ongoing or completed during 2021 are summarized in Table 2.

Table 2. Status of activities at the end of 2021

Working Group	Name of the Activity	Planned Activity Timeframe	Main information and outputs
<i>Avena</i>	Updated morphological Descriptors for <i>Avena</i> Species (UMORPHEAS)	March 2020 - February 2022	Actual starting date remained pending, waiting for the possibility to hold a physical meeting. Eventually, an online kick-off meeting was scheduled for March 2022.
Berries	Collaborative action for updating the documenting about berry genetic resources in Europe (EUROPE.BERRIES)	January 2021 - June 2023	Two online meetings took place in April and September 2021. Partners started to work on inventories of genetic resources of berries.
<i>Beta</i>	Improving a cooperation network between actors involved in conservation and utilization of <i>Beta</i> genetic resources (BETANET)	December 2017 - November 2018	The final report is pending.

Working Group	Name of the Activity	Planned Activity Timeframe	Main information and outputs
<i>Brassica</i>	Capturing <i>Brassica</i> Wild Relatives Diversity in South Eastern Europe (EUBRASWILD)	October 2020 – August 2023	The Activity plans to identify and collect new accessions of <i>Brassica</i> CWRs for inclusion into AEGIS and to improve genebank management in accordance with AEGIS principles. The second meeting was held online in March 2021. Collecting missions of wild brassicas were carried out by partners in the involved countries.
Cucurbits	Exploitation of <i>Cucurbita</i> local germplasm for sustainable agriculture (Cucurbitlocal)	February 2021 – January 2023	The Activity aims to build a genetic resources inventory of local <i>Cucurbita</i> accessions, characterize primary traits of at least 60 <i>Cucurbita</i> accessions and carry out agronomic evaluation of selected accessions in low-input crop management systems. Selected accessions should be identified for inclusion in AEGIS and/or for promoting their use. The first meeting was held online in February 2021 (minutes). The second meeting was held online in October 2021 (report). Results of characterization and preliminary evaluation of <i>Cucurbita</i> accessions were presented. Accessions to be included in AEGIS have been selected by the German genebank. Evaluations in Tunisia focused on low water regime conditions and powdery mildew tolerance. A second and more complete round of evaluations is planned for 2022, also with exchanges of accessions among partners.
Documentation and Information	GRIN-Global Workshop 2021 for European Genebanks (GRIN-Global II)	September 2020 – February 2021	Implementation of the Activity was delayed owing to the COVID-19 pandemic. The Activity aims to organize a workshop dedicated to countries with an interest in adopting GRIN-Global. An invited expert will introduce the past, present, and future of GRIN-Global. The workshop has been postponed until physical meetings can take place again and was tentatively scheduled for October 2022.
Forages and Documentation and Information	Facilitating use on the European perennial ryegrass collection: improving access to genetic resources and C&E data (ImprovLoliumCol)	September 2018 – August 2021	Owing to the COVID-19 pandemic, most of the work was delayed. To enable the completion of tasks, the Activity was extended until the end of April 2022.
Grain legumes	Efficient management of resources for smart legumes utilization (SMARTLEG)	January 2017 – December 2017	Some details in the final report remained pending, but the Activity has been completed.
Grain legumes	Lathyrus diversity: available resources with relevance to crop improvement - progress reviews and relationship with AEGIS (EUGrainLeg)	August 2018 – March 2021	Partners have completed the characterization of <i>Lathyrus</i> accessions. The final meeting took place online in January 2022 and the final report is pending.
<i>Malus/Pyrus</i>	Building and promoting a European <i>Pyrus</i> collection - a case study (EcoHisPy)	January 2015 – December 2016	The final report is pending.
<i>Malus/Pyrus</i>	Common ECPGR protocols and tools available for Characterization & Evaluation of <i>Malus/Pyrus</i> genetic resources (Pomefruit - C&E)	February 2017 – September 2019	The Activity was completed. The final report is pending. Published article: Kajkut Zeljkovic et al. 2021. Genetic diversity of pear germplasm in Bosnia and Herzegovina, as revealed by SSR markers. <i>Zemdirbyste-Agriculture</i> 108 (1), 71-78. DOI: 10.13080/z-a.2021.108.010 This Activity was supported by the German Federal Ministry of Food and Agriculture.

Working Group	Name of the Activity	Planned Activity Timeframe	Main information and outputs
Medicinal and Aromatic Plants	Promoting the implementation and the establishment of the European MAP Collection (MAP EUROCOLLECTION)	September 2016 – September 2017	The final Activity report was expected to be completed in early 2022 (here). 241 accessions from 57 species from Bulgaria, Germany, Portugal and Romania will be included in the European MAP Collection as part of AEGIS.
<i>Prunus</i>	Testing, Use and Alignment of genetic data to distinguish unique and characterized accessions (Prunus Alignment)	February 2018 – April 2020	The final activity report was provided in January 2021 (here). Published article: Ordidge et al. 2021. Towards a Joint International Database: Alignment of SSR Marker Data for European Collections of Cherry Germplasm. <i>Plants</i> 10(6), 1243. DOI: 10.3390/plants10061243
<i>Prunus</i>	Improvement of Fruit Tree Data Inclusion in EURISCO (FRUITTREEDATA)	January 2022 – December 2023	This Activity, submitted under the Fifth Call, was selected for funding by the Executive Committee in November 2021. The project will increase and update the listing of available material within EURISCO, increase the phenotypic information within EURISCO and highlight and consider the opportunity and need to identify clonal material held under different accession names within different countries.
Umbellifer crops	Improving the characterization and conservation of umbellifer crop wild relatives in Europe (CarrotDiverse)	February 2017 – September 2019	The Activity was concluded in 2019, but partners wished to carry out the final analysis of the data, input in EURISCO and prepare scientific publications. However, the pandemic caused some issues in terms of staffing and ability to carry out the final analyses. The final report remained pending. This Activity was supported by the German Federal Ministry of Food and Agriculture.
<i>Vitis</i>	Enhancing quality and quantity of <i>Vitis</i> genetic resources in AEGIS (AEG-VIT-IS)	January 2020 – December 2020	The Activity was concluded with the definition of guidelines for the selection of <i>Vitis</i> candidate accessions for AEGIS. Partners agreed to prepare operational genebank manuals and one was completed (JKI, Germany). Molecular profiles of 284 local accessions were compared with international databases to resolve unsolved identities. The final Activity report was published in March 2022 (here).
Wheat	Training on identification of botanical varieties in <i>Triticum</i> species (Training in <i>Triticum</i> species: TTS)	July 2018 – September 2019	The final report is pending.
Wild species conservation in genetic reserves	Identification, preparation of applications and approval of sites to join the European <i>in situ</i> PGRFA conservation network (Inclusion of CWR sites in European <i>in situ</i> network)	September 2019 – July 2021	The final conference International Conference Ensuring Diversity for Food and Agriculture: Plant genetic resources – in nature and on-farm , of Farmer's Pride , in association with the European Association for Research on Plant Breeding (EUCARPIA) – Genetic Resources Section, and ECPGR, took place online in June and July 2021. ECPGR partners in this Activity expressed their interest in the establishment of the European <i>in situ</i> PGR network. The final Activity report was published in July 2021 (here).

2.2 WORKING GROUP MEETINGS

- *Allium* Working Group

The eighth meeting of the *Allium* WG, originally planned for 26–27 May 2020 in Skierniewice, Poland, could not take place in 2021 and will be rescheduled for 2022.

- Solanaceae Working Group

The second meeting of the Solanaceae WG, originally planned for June 2020 in Pontecagnano, Italy, back-to-back with the EVA Pepper Network annual meeting, could not take place in 2021 and will be rescheduled for 2022.

2.3 AEGIS

2.3.1. AEGIS membership

In 2021 no additions were made to the number of countries or Associate Members of AEGIS, which remains at 35 Member Countries and 68 Associate Members (details [here](#)).

2.3.2. Status of the European Collection

By the end of December 2021, a total of 59,684 accessions from 20 contributors were part of the European Collection.

In 2021, the European Collection has increased by 1,994 accessions. One new country contributed for the first time (Slovenia). The changes in the composition of the European Collection over 2020 are shown in Table 3 below.

Table 3. The European Collection: breakdown by contributors

Contributor	No. of accessions flagged as AEGIS		Difference
	by end 2019	by end 2020	
1. Albania	8	8	-
2. Bosnia and Herzegovina	29	29	-
3. Bulgaria	341	391	+50
4. Croatia	90	90	-
5. Czech Republic	1,659	1,682	+23
6. Estonia	129	129	-
7. Germany	26,725	26,725	-
8. Italy	8,815	10,691	+1,876
9. Latvia	27	27	-
10. Lithuania	45	45	-
11. Montenegro	31	31	-
12. The Netherlands	5,841	5,841	-
13. Nordic Countries	4,779	4,785	+6
14. Poland	443	443	-
15. Portugal	86	86	-
16. Romania	732	752	+20
17. Slovakia	640	640	-
18. Slovenia	0	19	+19
19. Switzerland	5,611	5,611	-
20. United Kingdom	1,659	1,659	-
Total	57,690	59,684	+1,994

2.3.3. AEGIS-related actions

- Johannes Engels, Honorary Fellow of The Alliance of Bioversity International and CIAT, dedicated a small part of his time during 2021 to help the Secretariat with AEGIS-related tasks. Two new genebank manuals were completed and published online (JKI, Siebeldingen, Germany and SVGB, Suceava, Romania) and one crop-specific standard is under development (Berries); an opinion paper on AEGIS was published in *Plants* (see below).
- Within the framework of the Horizon 2020 project AGENT (see below), a task led by CGN, the Netherlands, is extending the peer review exercise to ten genebanks. However, it was not possible to carry out peer review visits in 2021 owing to COVID-19 restrictions and these were postponed to the year 2022.
- Within the framework of the Horizon 2020 project GenRes Bridge, the ECPGR Secretariat organized an online workshop on “Phytosanitary barriers for genetic resources” in February 2021 (see below), to raise awareness among genetic resources stakeholders and initiate a discussion on phytosanitary issues relevant for genetic resources conservation and sustainable use. The topic is of particular interest considering that quarantine pests and diseases may prevent the exchange of AEGIS material.

2.4. EURISCO

Both the activity report for 2020 and the workplan for 2021 were made available online on the [EURISCO web interface](#).

2.4.1 EURISCO coverage

In 2021, the number of accessions documented in EURISCO increased by 28,599 to 2,071,881. In total, the passport data of 472,176 accessions were updated or newly imported. In addition, 170,035 new records of phenotypic data were imported during the year. In total, phenotypic data are now available for 90,647 accessions from 17 countries¹.

Also in 2021, genebanks were encouraged to use Digital Object Identifiers (DOIs) as permanent unique identifiers (PUID). The number of accessions documented in EURISCO with a PUID increased to a total of 228,917 provided by eight countries. Since 2019, the EURISCO coordination, in close cooperation with the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), has offered a service to assist genebanks in registering their accessions for a DOI.

	Progress in 2021	Countries that contributed to the progress
Documented accessions	+28,599	Several countries. In addition, passport data updates of > 470,000 accessions
Phenotypic data records	+170,035	Austria, Azerbaijan, Czech Republic, Estonia, France, Germany, Greece, Italy, Latvia, The Netherlands, Nordic Countries, Poland, Portugal, Romania, Slovenia, Spain, The United Kingdom
DOI/PUIDs	+2,103	Armenia, Azerbaijan, France, Germany, Italy, The Netherlands, Romania, Slovenia

¹ Accessions from the five Nordic countries are maintained jointly by NordGen, headquartered in Sweden, and are only counted as one country in this enumeration.

2.4.2 EURISCO Newsletter

The EURISCO Newsletter was circulated in [December 2021](#). This publication is considered very important for providing feedback to EURISCO users.

2.4.3 EURISCO development

The main development features in 2021 focused on: i) the intranet support mechanisms for National Inventories and ii) activities for the development of the EURISCO-EVA infrastructure (see details below).

While upload and update mechanisms for passport data for National Focal Points (NFPs) had been largely developed by the end of 2020, extensive testing and several enhancements took place in 2021. The intranet interface was revised making it more visually appealing and allowing a purely web browser-based upload of passport data.

The database infrastructure for EURISCO-EVA was designed and implemented in Oracle DBMS and an initial version of a web application was developed and tested for the various EVA networks, enabling the management of project data, search functionalities and the definition of embargo periods. Data import templates were further developed and tested. Data import started in December 2021.

A general revision of the public EURISCO web application took place with necessary technological updates and evaluation of functionalities that could be discontinued due to little use. New functionalities were introduced based on users' feedback (e.g. combined searches of passport and phenotypic data, map-based selection, faceted search). A prototype of the new web application was presented at the end of 2021 to gather feedback from users. This is planned to become publicly available in spring 2022.

More details can be found in the EURISCO Annual Report 2021.

2.4.4 EURISCO training

The 2020 EURISCO training workshop had to be cancelled due to the COVID-19 pandemic. The situation did not improve much in 2021, so the idea to hold an on-site training had to be abandoned. Instead, the experiment of organizing a purely online training workshop was ventured. All necessary tools, slide sets, how-to documents and test data sets were adapted or newly created. The workshop took place 10–12 November 2021. Contrary to the expectations of both the participants and the organizers, the online-only workshop was considered very positive. Nevertheless, an online workshop cannot replace the exchange of experiences and ideas that takes place during an in-person workshop. The aim is therefore to hold the future biannual workshops as face-to-face events again.

2.4.5 Information on EURISCO provided at national and international meetings

The EURISCO Coordination has made various efforts to raise awareness of EURISCO in the community through presentations and publications:

- Presentation at the *34th Meeting of the EUCARPIA Fodder Crops and Amenity Grasses Section in cooperation with the EUCARPIA Festulolium Working Group*, 6–8 September 2021 (online event)
- Presentation at the meeting *Biodiversität der Nahrungspflanzen – Datenbank der Vielfalt*, Austrian Agency for Health and Food Safety (AGES), Linz, Austria, 20 September 2021 (by video conference)
- Presentation at the *EUCLEG Workshop on Genomics assisted breeding in forage and grain legumes*, 30 September – 1 October 2021 (online event)

2.4.6 EURISCO Advisory Committee

The third EURISCO Advisory Committee meeting was held online on 7 July 2021 (minutes [here](#)).

Discussion focused on two data domains that are currently not included in EURISCO, but deserve attention in the near future, i.e. data related to *in situ* material and material under development (e.g. lines within accessions, often with their own DOI). It was concluded that a proposal should be developed for the extension of EURISCO to host *in situ* data, including the options for establishing a specific data-flow mechanism. This preparatory work was instrumental to the submission of a proposal for funding (see below, Section 2.6).

Regarding information related to Single Seed Descent (SSD) lines and other derived material, it will be necessary to further explore the various possibilities and develop possible scenarios to be evaluated before making a recommendation, such as in the framework of the AGENT project.

2.4.6 EURISCO Data Sharing Agreement

The original EURISCO Data Sharing Agreement (DSA) expired in December 2020. A new DSA, renewing the formal agreement for data sharing between the Alliance of Bioversity International and CIAT and the countries contributing data to EURISCO was approved by the Alliance legal office and sent for signature to all the EURISCO National Inventory Focal Points. At the end of 2021, 16 out of 43 countries had sent back their signed copy.

2.5. EUROPEAN EVALUATION NETWORK (EVA)

In its third year, the [ECPGR European Evaluation Network \(EVA\)](#), funded by the German Federal Ministry of Food and Agriculture, continued to progress. The five crop-specific networks proceeded with their project activities following their network-specific workplans for the phenotypic and genotypic evaluation of crop accessions.

To offset delays experienced within the networks due to the COVID-19 pandemic, the German donor agreed to a no-cost extension of the current project until November 2023 to allow the networks to finalize their activities and plan for continuation of their projects. Within the framework of the Horizon 2020 project AGENT, the EVA Wheat and Barley network is further extending its activities until 2024, with a third set of accessions provided by AGENT partners and the potential to make additional several thousands of wheat and barley accessions accessible for future evaluation cycles.

Several new partners have joined the EVA networks, increasing the number of active participants to 92 partners from 28 countries who have signed the Letter of Commitment and their network's cooperation agreements. Additional partners may join the networks for future evaluation cycles.

Due to the continued restrictions imposed by the COVID-19 pandemic, annual project meetings of the crop-specific networks were held virtually in 2021, and additional virtual meetings were used to discuss, review and plan ongoing activities. Reports of the annual meetings are available in Section 4 of this report.

Some key indicators for the EVA networks are listed in the table below.

Table 4. Key indicators for the EVA networks

EVA Network	Countries involved	Public partners	Private partners	Meetings held in 2021 ¹⁾	Trials in 2021	Accessions evaluated in 2021
EVA Wheat and Barley	20	21	26	2	95	1,153
EVA Carrot	7	6	8	1	11	60
EVA Lettuce	8	6	6	5	7	62
EVA Pepper	10	9	6	1	10	170
EVA Maize	9	10	8	2	12	218

¹⁾ Including annual and coordinating project meetings. Only the reports from annual meetings are made publicly available.

The development of the EURISCO-EVA intranet was one of the major milestones accomplished in 2021 (also see above, EURISCO section 2.4.3). This system was designed to provide network partners access to all relevant experiment metadata and collected phenotypic data, facilitating analyses and providing compatibility with the EURISCO information system, which should host the phenotypic data after the end of the project's embargo period. A beta version of the intranet was shared with partners and presented during annual meetings. Some adjustments to data collection templates to make them compatible with direct upload to the database were implemented and it is expected that a final version of the intranet will be available to all networks by spring of 2022.

Phenotypic evaluations continued in 2021, with EVA Pepper and EVA Maize starting evaluations of their first sets of accessions. EVA Wheat and Barley collected evaluation data of a first set of barley, wheat and durum wheat accessions, mainly for biotic stress responses, from more than 70 evaluation sites across Europe. EVA carrot repeated its field evaluations on European carrot accessions and landraces, collecting data for agronomic traits as well as biotic stress responses. EVA lettuce proceeded to in-depth field trials on a subset of cultivated lettuce accessions selected from the full set evaluated in 2020. EVA Pepper selected 160 accessions for field trials that are being evaluated across Europe in two sets during 2021 and 2022. The EVA Maize network started evaluations in 2021 with the initial characterization of a first full set of accessions, from which a subset was selected for production of hybrid populations in winter nurseries and in-depth evaluation of both landraces and hybrids in 2022.

Multiplication of additional accession sets for wheat, barley, durum wheat and maize provide material for phenotypic evaluations in 2022.

Genotyping activities proceeded for all networks, using different approaches for the different crops. Wheat, barley, maize and pepper are genotyped using SNP arrays, with pepper also adding marker genotyping for relevant resistance traits. EVA carrot is using a genotyping approach combining three different technologies, Genotyping-by-Sequencing (GBS), Whole genome resequencing and a newly developed SNP array, generating a wealth of genotypic data. EVA Lettuce is developing a new resource for lettuce genotyping, using Single Primer Enrichment Technology (SPET).

2.6 CROP WILD RELATIVES *IN SITU* DATA IN EURISCO

In October 2021, the ECPGR Secretariat submitted the proposal 'Extension of EURISCO for Crop Wild Relatives (CWR) *in situ* data and preparation of pilot countries' data sets' for funding to the German Federal Ministry of Food and Agriculture. The proposal, with a budget of €247,318 over three years, was approved in December 2021.

The [project](#), coordinated by the ECPGR Secretariat, intends to endow the European region with a centralized, public and web-searchable inventory of passport data for *in situ* CWR priority populations that can be made in principle accessible to users. A fine-tuned data flow mechanism using an internationally agreed exchange standard will also be developed, facilitating data transfer from National Inventories of *in situ* CWR populations to EURISCO. The project will also provide capacity building to a pilot group of European countries to add their country data. The list of partners includes Cyprus, the Czech Republic, Germany, Lithuania, the Netherlands, Portugal, Spain and the United Kingdom. Other countries will be encouraged to join the effort. The EURISCO Advisory Committee and the FAO-ITPGRFA Secretariat will be involved at the early stages of the project to help in the definition of the data flow mechanism.

3. LINKS WITH OTHER NETWORKS AND INITIATIVES

3.1. EUROPEAN COMMISSION

3.1.1. Horizon 2020 projects

- [GenRes Bridge](#) – a Coordination and Support Action on ‘[Joining forces for genetic resources and biodiversity management](#)’ (2019–2021)

In its final year of activity, the project – coordinated by the European Forest Institute, Finland, and involving the three European networks (ECPGR, EUFORGEN and ERFP) – completed and published the [Genetic Resources Strategy for Europe](#). Several rounds of stakeholder consultations and revisions resulted in a document endorsed by the Steering Committees of the three networks that provides a strategic framework for genetic resources over the next decade. This Strategy was complemented by three domain-specific strategies on animals, forests and plants. The [Plant Genetic Resources Strategy for Europe](#) was finalized as a joint effort of an ECPGR drafting team, composed of nine volunteers from National Coordination offices.

The strategies were presented to the European Commission and genetic resources stakeholders during a hybrid in-person and online [launch event](#) on 30 November 2021 in Brussels, Belgium. A video recording of the event is available on the [GenRes Bridge website](#). On the margins of the strategies' launch, the project partners met for a final project meeting and discussed potential joint follow-up activities to start implementing the Strategy.

In February 2021, ECPGR organized an online workshop on “Phytosanitary barriers for genetic resources”, to address the problem of phytosanitary issues to the exchange of germplasm of crops, selected forest trees, fruit trees and other vegetatively propagated crops. Videos of webinars providing background on the European Plant Health Regulation, CGIAR genebank initiatives to improve phytosanitary security within material exchange and genebank specific derogations within the European Animal Health Regulations are available on the [GenRes Bridge website](#). The workshop was attended by 35 phytosanitary regulation and genebanks experts across Europe. Presentations of case studies describing i) current issues affecting *ex situ* seed and fruit-tree field collections, ii) proposed updates for import regulatory guidelines for *Vitis* germplasm, and iii) the detrimental effects of pests on forest genetic resources in Europe are available on the [ECPGR website](#). Participants confirmed the importance of effectively managing phytosanitary risks at an acceptable level and providing the quality assurances necessary to ensure that genetic resources collections can be maintained, and genetic material safely exchanged. Potential collaborative actions were identified to move towards increased safety with appropriate and ideally harmonized protocols. The results of the workshop were communicated to the regulatory agencies for further cooperation.

Genetic Resources journal

The open access journal *Genetic Resources* (www.genresj.org), launched in 2020, continued operation with the financial support from the GenRes Bridge project. The ECPGR Secretariat provides the editorial office of the journal, which is published by Bioversity International on behalf of ECPGR.

The journal aims at disseminating global knowledge and tools used by the community of practitioners of plant, animal and forest genetic resources involved in monitoring, collecting, maintaining, conserving, characterizing and using genetic resources for food, agriculture and forestry, welcoming contributions from all world regions.

In 2021, *Genetic Resources* published two regular issues 4 and 5, including contributions from all three genetic resources domains and thus positioning the journal as a truly cross-cutting medium providing information for stakeholders in the different fields. The two issues are accessible here:

<https://www.genresj.org/index.php/grj/issue/view/genresj.2021.3>.

<https://www.genresj.org/index.php/grj/issue/view/genresj.2021.4>.

A special issue was published in February 2021, the [abstract book for the “International Congress on the Breeding of Sheep and Goats” \(Bonn, Germany October 2020\)](#), which was edited in collaboration with the German Ministry of Food and Agriculture.

An [impact report](#) based on usage statistics and a survey among readers evaluated the success and relevance of the journal after its first year of publication, highlighting the interest of genetic resources stakeholders in the continuation of this product. The report addressed the need for a sustainability plan, indicating options for continuation of the journal after the end of the GenRes Bridge project. ECPGR and ERFPP have confirmed their commitment to continue the journal.

- [Activated Genebank NeTwork \(AGENT\)](#) – a Coordination and Support Action on [Establishing an innovative gene bank network](#) (2020–2025)

The project, coordinated by the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Gatersleben, Germany, includes ECPGR-relevant activities such as capacity building for genebanks, genebank reviews and an extension to the EVA Wheat and Barley network, also including the involvement of an Italian organic farmers’ network, coordinated by Rete Semi Rurali (see above, section 2.5). AGENT aims to unlock the full potential of the biological material stored in genebanks around the globe by using FAIR international data standards and an open digital infrastructure for the management of plant genetic resources. The ECPGR Secretariat leads one work package (WP7), in which CGN the Netherlands is also coordinating genebank peer reviews and training workshops.

In-person genebank review visits, planned for 2020 and then for 2021, had to be postponed due to the COVID-19 pandemic and travel restrictions.

- [Farmer’s Pride](#) – a Coordination and Support Action on [“Networking, partnerships and tools to enhance *in situ* conservation of European plant genetic resources”](#) (2017–2021)

The project, coordinated by the University of Birmingham, involved two ECPGR Working Group Chairs: Nigel Maxted (Wild Species Conservation in Genetic Reserves Working Group) and Valeria Negri (On-Farm Conservation and Management Working Group).

A number of Farmers’ Pride achievements were made accessible from the ECPGR On-farm Conservation and Management Working Group website ([here](#)), including guidelines for *in situ* landrace propagation management and access, a best practice evidence-based database on *in situ* landraces and other products and reports.

The final international conference *Ensuring diversity for food and agriculture – Plant genetic resources in nature and on-farm* took place virtually 28 June–1 July 2021, organized in association with EUCARPIA – Genetic Resources Section, and ECPGR. In preparation for this conference, in June 2021, the ECPGR Steering Committee finalized an ECPGR position statement on the establishment of the Farmer’s Pride proposed *in situ* network for crop wild relatives and on-farm landraces genetic resources. While praising the project for its concrete achievements, the position questioned the opportunity of establishing one single network clustering crop wild relatives and landraces, and recommended follow up of activities within the framework of the ECPGR structure and mode of operation.

- [DYNAVERSITY – Conserving diversity *in situ* in agriculture and in the food chain](#) (2019–2021)

The project, coordinated by ARCADIA, Belgium, had its final conference online on 20 April 2021. Among various products, DYNAVERSITY has recently published [three technical manuals on community seedbanks](#). The ECPGR Secretary participated in the project’s Sharing Knowledge and Experience Platform (SKEP).

- [EUCLEG – Breeding Forage and Grain Legumes](#) to increase EU’s and China’s protein self-sufficiency (2018–2021)

The project, coordinated by INRAE, France, had the objective to improve the diversification of crops, crop productivity, yield stability and protein quality of both forage (alfalfa and red clover) and grain (pea, faba bean and soybean) legumes. The project encouraged European collection holders to upload information on alfalfa, red clover, pea, faba bean and soybean to EURISCO and the exchange format for

characterization and evaluation data established in the EURISCO network was used for this purpose. The EURISCO Coordinator was a partner in EUCLEG. A search portal connecting the project's data with information from EURISCO was developed.

- [BRESOV – Breeding for Resilient, Efficient and Sustainable Organic Vegetable Production](#) (2018–2023)

The project, coordinated by the University of Catania, Italy, aims to tackle the nutritional challenges of a growing world population and changing climatic conditions by enhancing the productivity of different vegetable crops in an organic and sustainable farming infrastructure. BRESOV works on brassica, snap bean and tomato. The ECPGR Secretariat is represented on the scientific advisory board by the EVA Coordinator, Sandra Goritschnig.

- [INCREASE – Intelligent Collections of Food Legumes Genetic Resources for European Agrofood Systems](#). (2020–2025)

The project, coordinated by Università Politecnica delle Marche, Italy, aims at improving the sustainable use of plant genetic resources by enhancing the status of chickpea, common bean, lentil and lupin genetic resources. ECPGR contributed to publicizing within its network the INCREASE Citizen Science Experiment, involving 3,450 participants who will grow bean varieties all over Europe and generate characterization data for the project.

- [BrasExplor – Wide exploration of genetic diversity in Brassica species for sustainable crop production](#) (2020 – 2023)

The project, coordinated by INRAE, France, aims to identify relevant material of *Brassica rapa* and *Brassica oleracea* and their adaptive traits to face upcoming climate change in the Mediterranean area, and contribute to biodiversity-based agriculture. The ECPGR Secretary was invited to be part of the Advisory Board.

- [BreedingValue – Pre-breeding strategies for obtaining new resilient and added value berries](#) (2021–2024)

This project, coordinated by the Università Politecnica delle Marche, Italy, focuses on berries (strawberry, raspberry and blueberry) to identify conserved germplasm appropriate for sustainable berry production throughout the EU. It will apply the latest genotyping and phenotyping tools for the characterization of local varieties. The ECPGR Secretary was invited to be part of the Advisory Board.

3.2. LIAISING WITH PARTNER ORGANIZATIONS

Relationship with specific partner organizations was maintained or strengthened, as part of the preparation of the strategies within the GenRes Bridge framework (BGCI, EUFORGEN, ERFP, Euroseeds). The Farmer's Pride and EUCARPIA international meeting on 28 June–1 July 2021 (online) was organized as a joint event with ECPGR. The Secretariat helped in the dissemination of information, participated in the conference and contributed to the EUCARPIA bulletin. Collaboration with the Crop Trust continued with the exchange of information, such as the provision of contact details of sunflower experts for the global strategy. The FAO-ITPGRFA Secretariat was invited to attend as an observer at the EURISCO Advisory Committee meeting and coordination was established for future work on crop wild relatives data in EURISCO (use of FAO descriptors).

4. PUBLICATIONS AND PUBLIC AWARENESS

4.1. PUBLICATIONS PRODUCED IN 2021

4.1.1. Administrative and operational documents

- ECPGR [Annual Progress Report 2020](#) and Financial Report 2020

4.1.2. Reports from ECPGR bodies

- [Minutes of the seventeenth meeting of the ECPGR Executive Committee](#), 7 May 2021, online
- [Minutes of the third meeting of the EURISCO Advisory Committee](#), 7 July 2021, online.
- [Minutes of the ad hoc meeting of the ECPGR drafting team \(and eighteenth meeting of the ECPGR Executive Committee\)](#), 1 December 2021, Brussels, Belgium
- [Minutes of the nineteenth meeting of the ECPGR Executive Committee](#), 13 December 2021, online

4.1.3. Grant Scheme Activity reports and related data

- [Inclusion of CWR sites in European *in situ* network](#) – by J. Labokas
- [Testing, use and alignment of genetic data to distinguish unique and characterized accessions in *Prunus* \(*Prunus* alignment\)](#) – by M. Ordidge et al.

4.1.4. European Evaluation Network (EVA)

- [Report of the second EVA Carrot network annual meeting, 20 April 2021, online](#)
- [Report of the second EVA Pepper network annual meeting, 14 June 2021, online](#)
- [Report of the second EVA Wheat and Barley network annual meeting, 21 October 2021, online](#)
- [Report of the second EVA Maize network annual meeting, 22 November 2021, online](#)

4.1.5. Working Groups

- [Report of a Working Group on Berries, First Meeting, Dresden, Germany, 14-15 January 2020](#) – by L Maggioni and V. Bryant

4.1.6. ECPGR Information Bulletin

The Bulletin was published in February (issue no. 21), July (no. 22) and December (no. 23). The Bulletin is distributed by email to all Steering Committee and Working Group members and is also available [online](#).

4.1.6. European Strategies

[ECPGR. 2021. Plant Genetic Resources Strategy for Europe. European Cooperative Programme for Plant Genetic Resources, Rome, Italy.](#)

- [GenRes Bridge Project Consortium, ECPGR, ERF and EUFORGEN. 2021. Genetic Resources Strategy for Europe. European Forest Institute.](#)

4.1.8. External publications with contribution from the Secretariat

Goritschnig S and **Maggioni L** - EVA - European Evaluation Networks harnessing crop genetic diversity present in European genebanks [abstract] - Presented at EUCARPIA Breeding and seed sector innovations for organic food systems, 8-10 March 2021.

Goritschnig S and **Maggioni L** - EVA European Evaluation Networks. Abstract accepted for the 2nd International Agrobiodiversity Congress, 15-18 November 2021, Rome, Italy (presentation recording available [here](#)).

Van Hintum T, **Engels JMM**, **Maggioni L** (2021). AEGIS, the Virtual European Genebank: Why it is such a good idea, why it is not working and how it could be improved. *Plants* 10, 2165. <https://doi.org/10.3390/plants>

Maggioni L - Studies on domestication of *Brassica oleracea* L. point at possible feral status of European north-western Atlantic populations [abstract] - Presented at Botany 2021, 18-23 July 2021 (virtual) - Annual Conference of Botany Scientific Societies.

<http://2021.botanyconference.org/engine/search/index.php?func=detail&aid=549>

4.2. OTHER PUBLIC AWARENESS PRODUCTS

- On the occasion of 40 years of cooperation with ECPGR for diversity and food security, a 4-minute promotional video, produced by the company Duckrabbit, was developed under the supervision of an ECPGR Task Force. [‘Saving European plant and food diversity: together, we are stronger!’](#) is featuring the ECPGR National coordinator from Belgium, Marc Lateur telling a story about apple diversity (> 800 visualizations).
- Two new roll-up banners on EVA and the *Genetic Resources* journal were prepared for the genetic resources strategies launch event in Brussels. Together with the existing roll-ups on ECPGR and AEGIS, the layouts are [available for download](#), should any national programme wish to print the same for use at local events.

4.3. PARTICIPATION IN INTERNATIONAL MEETINGS

The Secretary and/or other ECPGR members represented ECPGR in the meetings listed below, offering presentations and/or contributing to project planning and/or attending as observers.

- 8-10 March 2021, online
EUCARPIA conference *Breeding and seed sector innovations for organic food systems*
- 28 June -1 July 2021, online
[Farmer’s Pride and EUCARPIA international meeting](#)
- 19-23 July 2021, online
[Botany 2021](#), Annual Conference of Premier Scientific Societies
- 9 September 2021, online
Round-table discussion on *Seeds and information: facilitated access to PGRFA and impact on research and breeding during the 13th Italian national congress on biodiversity*
- 17-19 October 2021, Prague, Czech Republic
EUROSEEDS congress
- 28 October 2021, online
Italian National Coordination meeting
- 15-18 November 2021, online
[2nd International Agrobiodiversity Congress](#)

- 30 November 2021, Brussels, Belgium
[GenRes Bridge launch of genetic resources strategy](#)
- 6 December 2021, online
University of Zagreb and Croatian Agency for Agriculture and Food, workshop on
Conservation and Sustainable Use of Plant Genetic Resources

5. ECPGR MEETINGS HELD IN 2021

5.1. GRANT SCHEME ACTIVITIES

- [Exploitation of *Cucurbita* local germplasm for sustainable agriculture \(Cucurbitlocal\)](#), first meeting, 26 February and second meeting, 28 October 2021, online.
- [Capturing *Brassica* Wild Relatives Diversity in South Eastern Europe \(Eubraswild\)](#), second meeting, 3 March 2021, online.
- [Collaborative action for updating the documenting about berry genetic resources in Europe \(EUROPE.BERRIES\)](#), first meeting, 21 April, and second meeting, 28 September 2021, online.
- [Identification, preparation of applications and approval of sites to join the European *in situ* PGRFA conservation network \(Inclusion of CWR sites in European *in situ* network\)](#), 28 June–1 July 2021, second meeting, online.

5.2. ECPGR BODIES

- [Seventeenth meeting of the ECPGR Executive Committee](#), 7 May 2021, online
- [Third meeting of the EURISCO Advisory Committee](#), 7 July 2021, online
- [Ad hoc meeting of the ECPGR drafting team and eighteenth meeting of the ECPGR Executive Committee](#), 1 December 2021, Brussels, Belgium
- [Nineteenth meeting of the ECPGR Executive Committee](#), 13 December 2021, online.

5.3. EUROPEAN EVALUATION NETWORK (EVA)

- [Second EVA Carrot Network annual project meeting](#), 20 April 2021, online
- [Second EVA Pepper Network annual project](#), 14 June 2021, online
- [Second EVA Wheat and Barley Network annual project meeting](#), 21 October 2021, online
- [Second EVA Maize Network annual project meeting](#), 22 November 2021, online.

6. COORDINATING SECRETARIAT

During 2021, the following staff employed by the Alliance of Bioversity International and CIAT have worked for the Coordinating Secretariat: Vanessa Bryant (half-time Administrative Assistant); Nora Capozio (Specialist, editing and communication), joined 15 November 2021; Sandra Goritschnig (Scientific Officer – EVA coordination and editorial management of the Genetic Resources journal); Elinor Lipman (half-time Scientific Assistant) until 12 March 2021; Lorenzo Maggioni (ECPGR Secretary); Loredana Maria (Senior Administrative Assistant – assisting in all administrative and financial matters and website maintenance). Stephan Weise (IPK, Gatersleben, Germany) acted as EURISCO Coordinator.

The scientific and technical contributions, as well as management and administrative support provided by other staff from the Alliance of Bioversity International and CIAT and from IPK to the work of ECPGR, are duly acknowledged.

★★★

Lorenzo Maggioni
ECPGR Secretary

(with inputs from Nora Capozio, Sandra Goritschnig, Loredana Maria and Stephan Weise)

Rome, 11 April 2022

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