ECPGR Towards Phase X

Lorenzo Maggioni (ECPGR Secretariat)

BETANET Workshop, 19 June 2018, Venice, Italy,

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ECPGR long-term goal

Stakeholders in Europe collaboratively, rationally and effectively conserve ex situ and in situ PGRFA, provide access and increase sustainable use

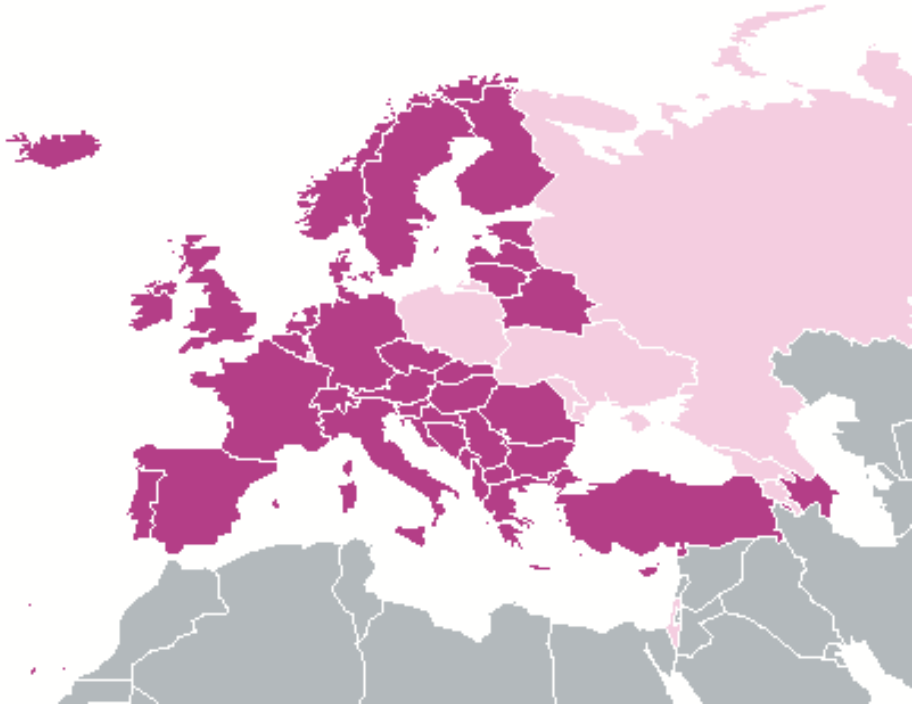
www.ecpgr.cgiar.org

Membership and funding

Ten Phases (1980-2023)

- Member countries contribute funding (ca. € 540 000 per year)
- National Coordinators are nominated at governmental level

- Use of funds:
  - Coordination
  - Working Group activities
  - Maintenance of EURISCO



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Structure

Executive Committee

Steering Committee

Coordinating Secretariat

Crop Working Groups

- *Allium*
- *Avena*
- Barley
- *Beta*
- *Brassica*
- Cucurbits
- Fibre Crops (Flax and Hemp)
- Forages
- Grain Legumes
- Leafy Vegetables
- *Malus/Pyrus*
- Medicinal and Aromatic Plants
- Potato
- *Prunus*
- Solanaceae
- Umbellifer Crops
- *Vitis*
- Wheat

Thematic Working Groups

- Wild Species Conservation in Genetic Reserves
- On-farm Conservation and Management
- Documentation and Information

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Objectives of ECPGR Phase X (2019 – 2023)

1. Ex situ

→ Conservation and provision of access through AEGIS and the European Collection

2. Documentation

→ Provision of passport and phenotypic information of ex situ and in situ through EURISCO

3. In situ

→Improve conservation and use of crop wild relatives

4. On-farm

→ Conservation and management of PGRFA diversity

5. Use of PGRFA

→ Through European Evaluation Network (EVA)

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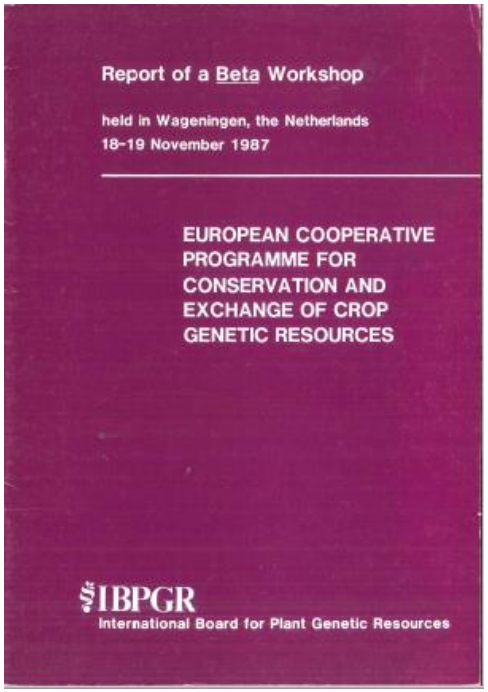
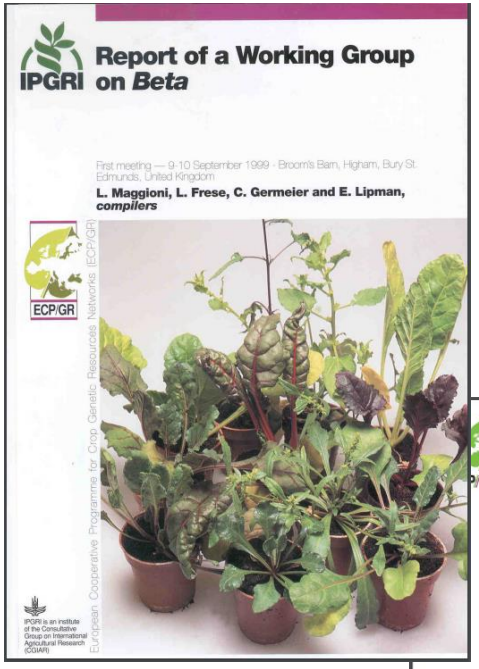
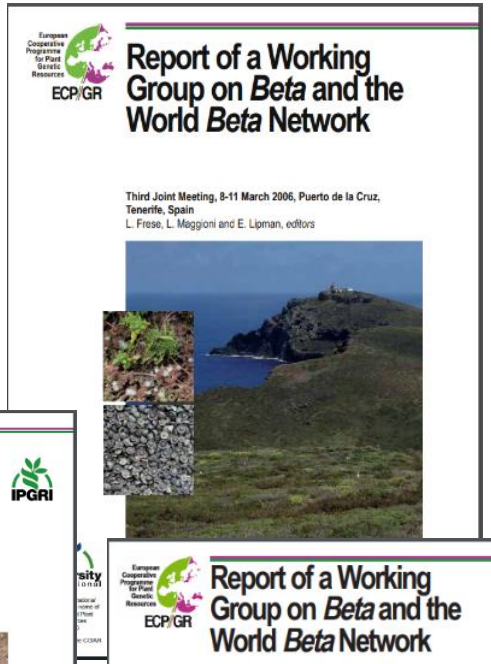
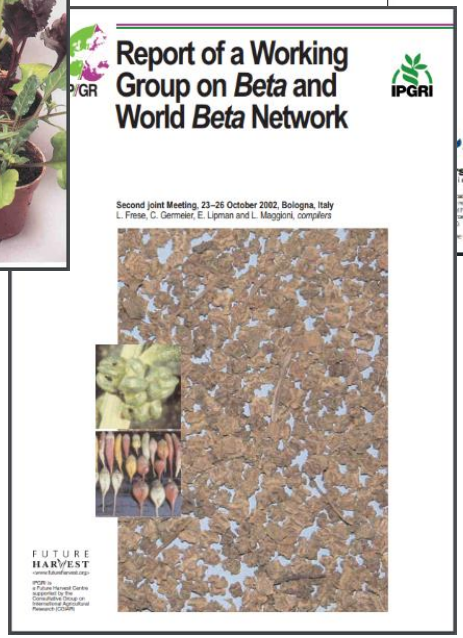
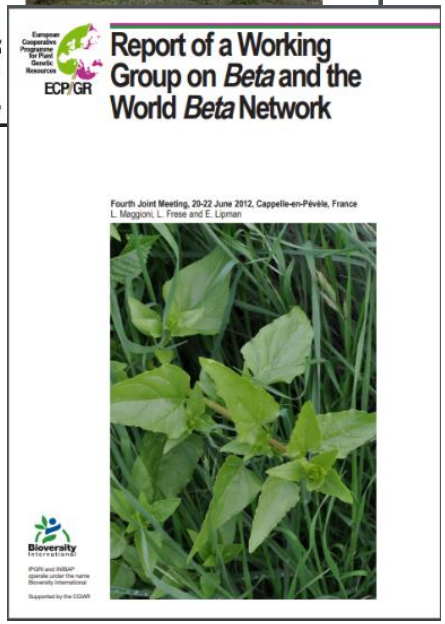
Working group on Beta











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ægis

A European Genebank Integrated System

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1. Ex situ conservation

A European Genebank Integrated System AEGIS

- Establishment of decentralized European Collection of unique and important accessions
- Memorandum of Understanding whereby countries commit to long-term conservation and management of European Accessions and to their availability
- Availability through SMTA, including non-Annex I material
- Quality System: agreed standards, reporting, monitoring & capacity building
- Role of Working Groups for the management of decentralized collection

http://aegis.cgiar.org/

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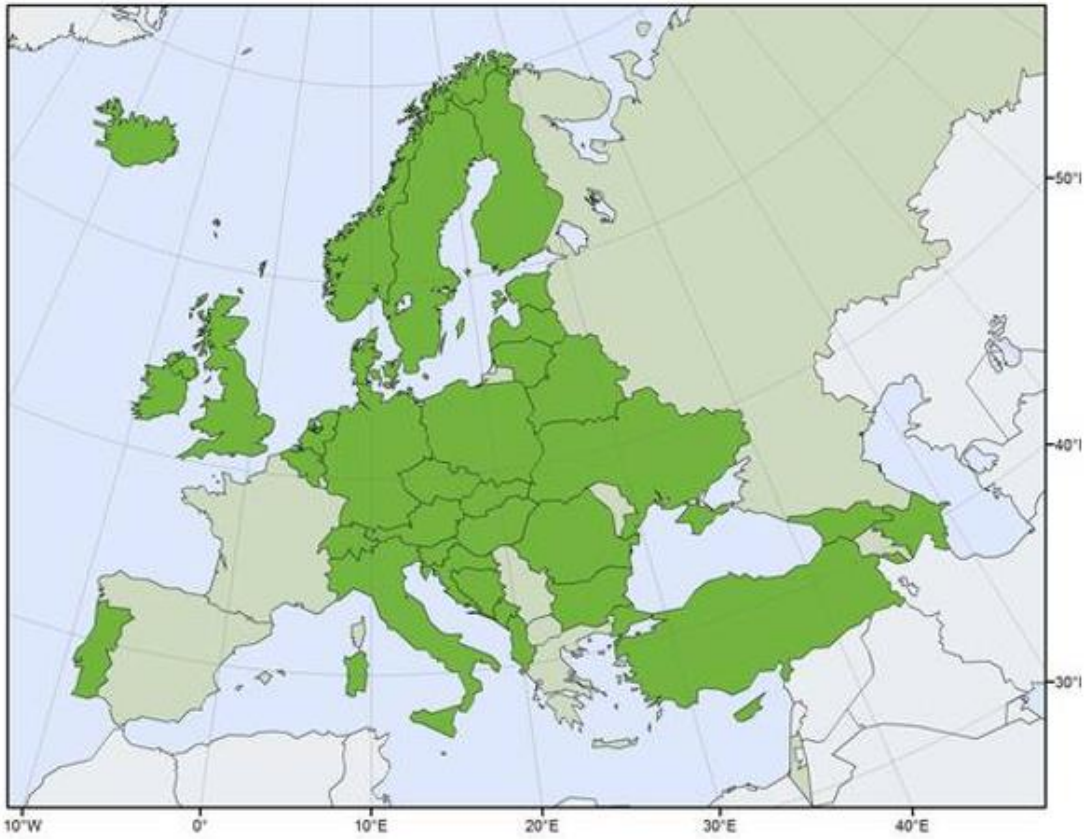
AEGIS membership



34 Member countries

62 Associate Member Institutions

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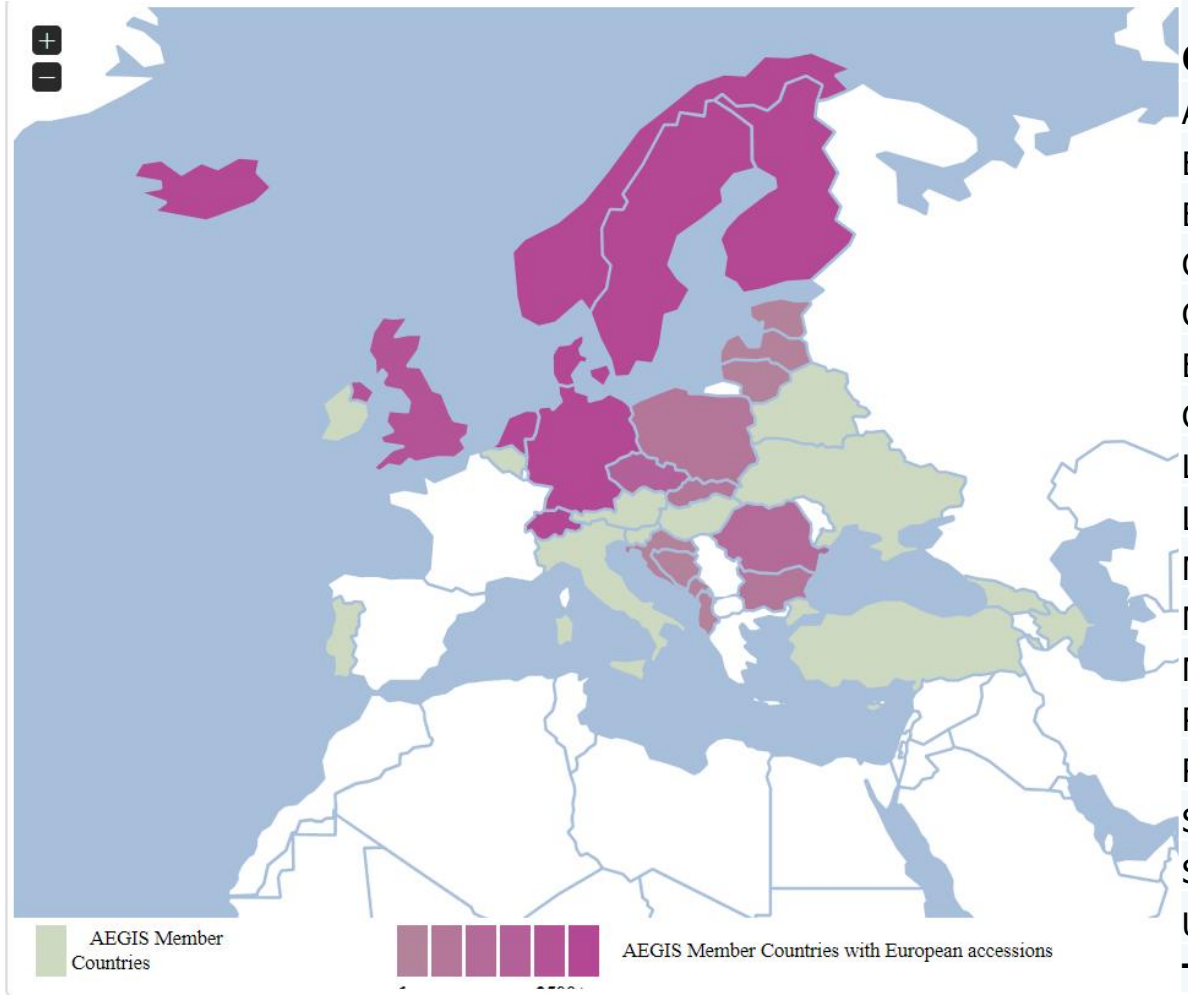
The European Collection

Total number of European Accessions: **34 364 (May 2018)**



Country	No of accessions
Albania	8
Bulgaria	341
Bosnia and Herz.	22
Croatia	90
Czechia	1341
Estonia	89
Germany	14183
Latvia	27
Lithuania	36
Montenegro	31
Netherlands	5853
Nordic Countries	3708
Poland	443
Romania	623
Slovakia	299
Switzerland	5611
United Kingdom	1659
Total	**34 364**

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Beta accessions in AEGIS
(60 vs. 7200 in EURISCO)

Beta (60)

Beta vulgaris	60	Nordic Countries (19), United Kingdom (41)

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Beta specific standards

CROP-SPECIFIC GENEBANK STANDARDS FOR ORTHODOX SEEDS

Agreed by the *Beta* Working Group

March 2016

FAO Genebank standards for orthodox seeds	Crop-specific genebank standards for orthodox seeds – *Beta* and *Patellifolia* species *No comment in this column means agreement with FAO standard*	Remarks (reasons for deviating from FAO standards)
4.1.5 The minimum number of plants from which seeds should be collected is between 30-60 plants, depending on the breeding system of the target species	The minimum number of plants from which seeds should be collected is between **40-100** plants, depending on the breeding system of the target species **and on the size of the population mainly for wild or rare species. In the cases the seed quantity is small multiplication must take place before storage.**	For *Beta* and *Patellifolia* species, seeds from 40-100 plants should be collected in the case of allogamous species. In the case of autogamous and apomictic species, especially if the target species is a threatened one, few seeds from at least 10 individuals but from as many sub-populations as possible should be collected.
4.2 Standards for drying and storage		
4.2.1 All seed samples should be dried to equilibrium in a controlled environment of 5-20°C and 10-25 percent of relative humidity, depending upon species.		According to genebank curators and different countries' seed increase manuals for *Beta*[1], seed samples should be dried in a controlled environment, till the moisture content drops to 5-8%.
4.2.2 After drying, all seed samples need to be sealed in a suitable airtight container for long term storage; in some instances where collections that need frequent access to seeds or likely to be depleted well before the predicted time for loss in viability, it is then possible to store seeds in non–airtight containers.		
4.2.3 Most-original-samples and safety duplicate samples should be stored under long-term conditions (base collections) at a temperature of -18 ± 3°C and relative humidity of 15 ± 3 percent.		When samples are stored in airtight bags or containers at -18°C, there is actually no need to control the relative humidity of the storage room.
4.2.4 For medium-term conditions (active collection) samples should be stored under refrigeration at 5-10°C and relative humidity of 15 ± 3 percent.		According to genebank curators the active collection can also be stored under long-term conditions (see also comment for standard 4.2.3).

[1] Manuals provided by countries are available online here.

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Beta specific standards

Beta Working Group - Documents and publications of interest

Documents developed by the Working Group

Crop-specific standards

- Crop-specific genebank standards for orthodox seeds (agreed by the *Beta* WG, March 2016) (102 KB)
  Note: these standards will be sent to the Steering Committee for endorsement.
- Seed increase protocol for *Beta* and *Patellifolia* species (231 KB) (updated version, November 2014)
- Summary of the discussion on quality concept of *Beta* conservation (In: Report of second meeting, Bologna 2002, pp. 14-15)
- Seed regeneration guidelines: available protocols can be found here, listed by country:
  - Belgium (18 KB) (Agricultural Research Centre, CLO, Gent)
  - Germany (50 KB) (JKI, Braunschweig)
  - Hungary (20 KB) (Institute for Agrobotany, Tápiószele)
  - Poland (76 KB)(Plant Breeding and Acclimatization Institute, Bydgoszcz)
  - Russian Federation (22 KB) (VIR, St Petersburg)
  - Turkey (25 KB)(AARI, Menemen - Izmir)
  - United Kingdom (23 KB) (Genetic Resources Unit, HRI, Wellesbourne)

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2. Documentation

Online catalogue

with information on the European *ex situ* collections: passport and recently characterization and evaluation data

eurisco
Finding seeds for the future

http://eurisco.ecpgr.org

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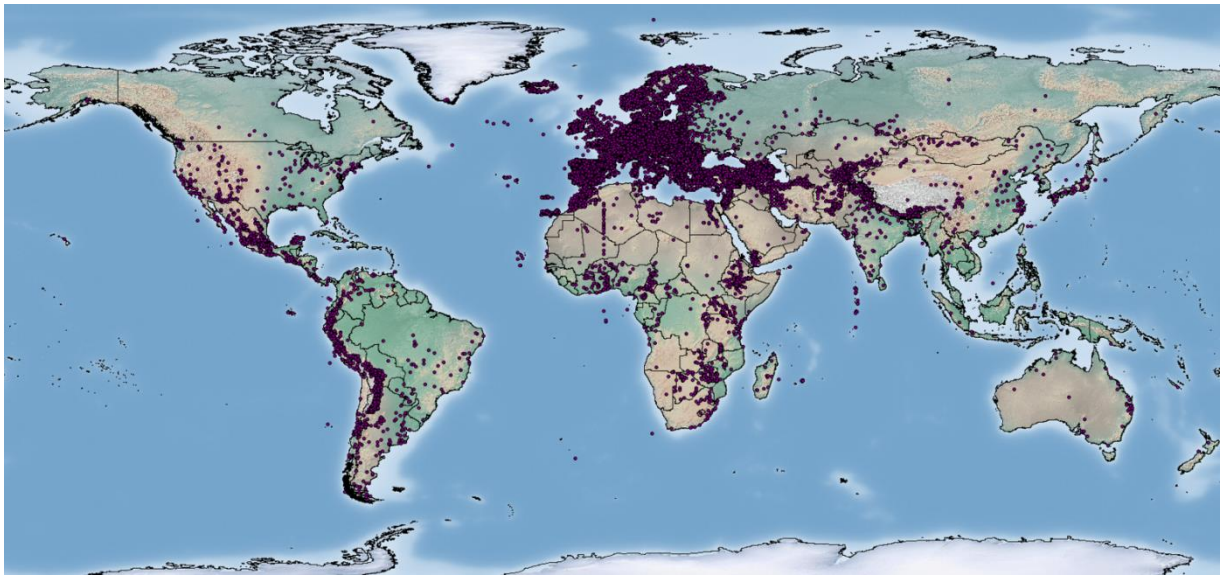
Online catalogue of accessions in European genebanks: EURISCO

- Data gathered from 43 national inventories
- 1.96M accession data from 372 institutions throughout Europe
- Largest PGR data provider at the accession level
- Register for the Multilateral System (418k) and AEGIS (34k) European accessions



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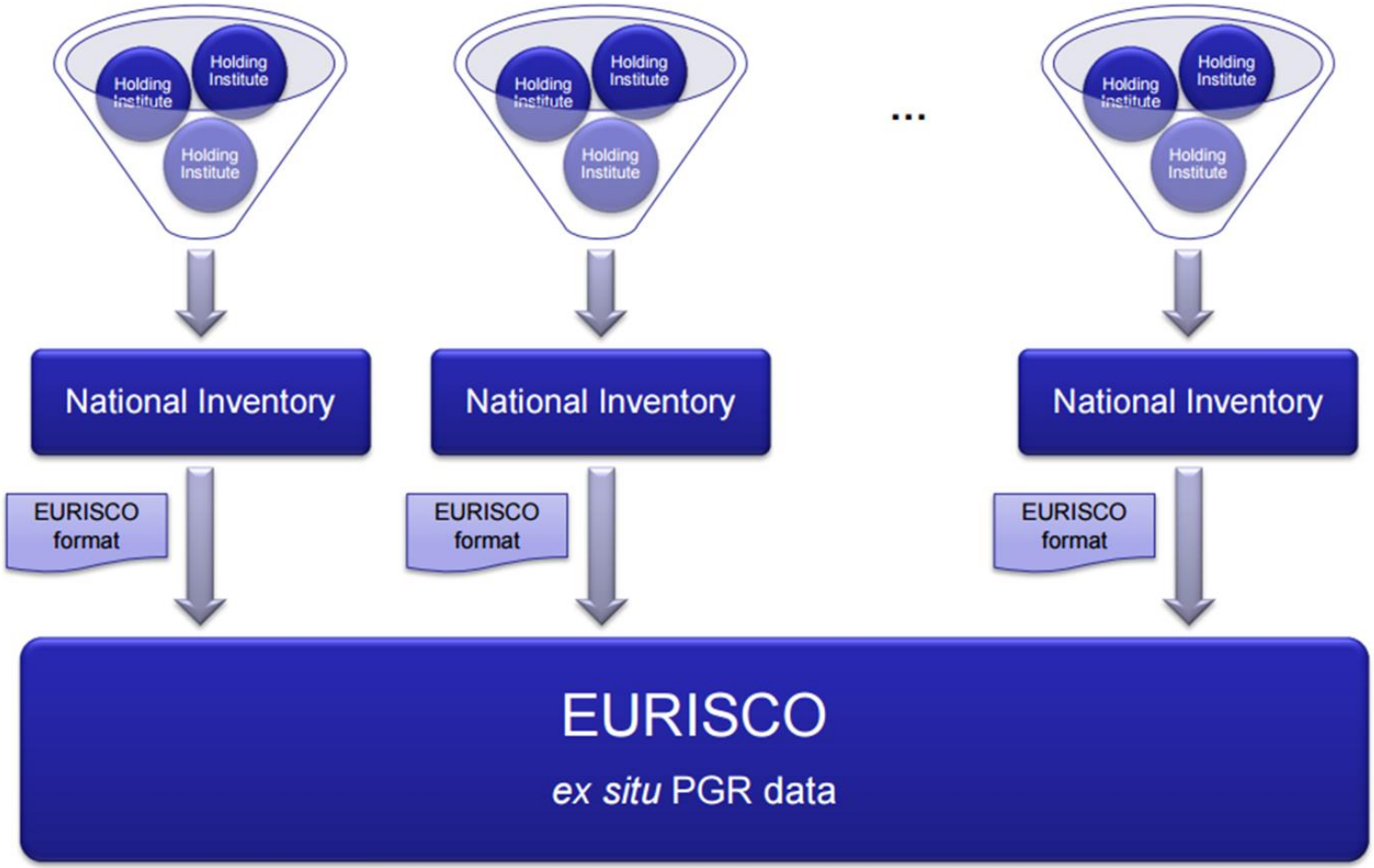
Data flow



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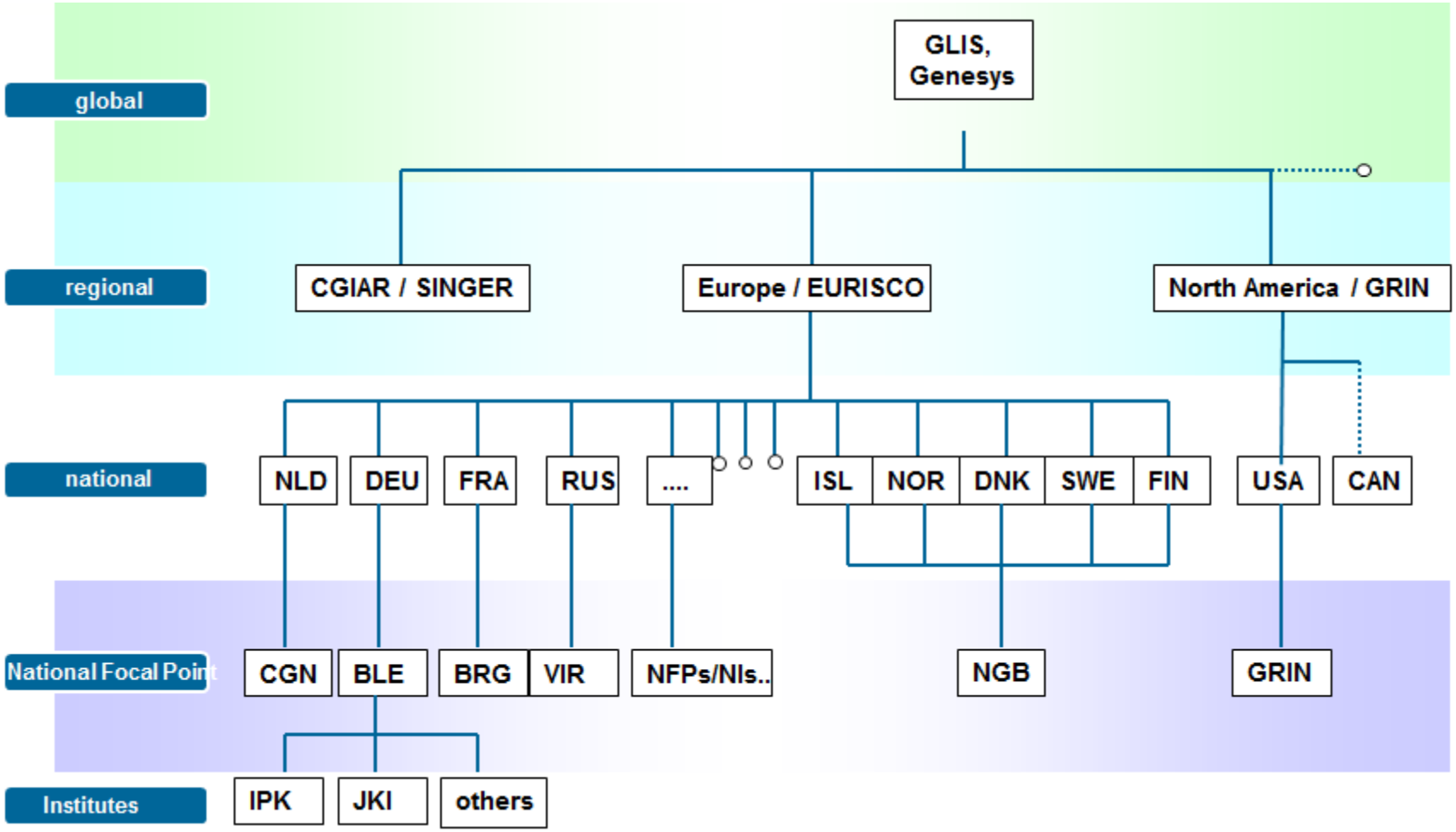
Global Information Infrastructure



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Beta accessions in EURISCO

(only passport data)

Beta vulgaris	5335		Beta nana	37
Beta sp.	1118		Beta macrorhiza	29
Beta maritima	279		Beta trygina	29
Beta macrocarpa	79		Beta (Patellifolia) procumbens	14
Beta corolliflora	76		Beta cicla	10
Beta (Patellifolia) patellaris	76		Beta patula	6
Beta x intermedia	68		Beta webbiana	4
Beta lomatogona	66		Other	10
			TOTAL	**7236**

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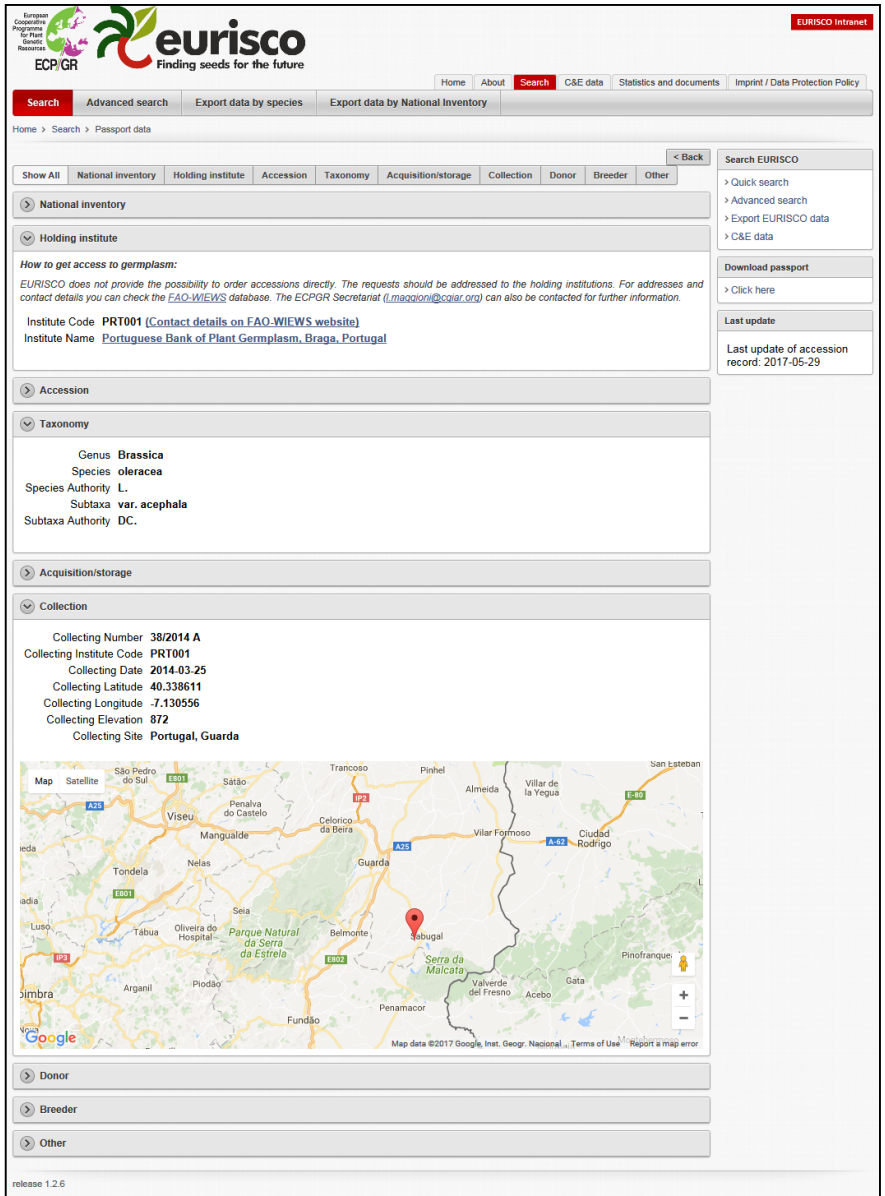
Passport data in EURISCO

- Four standard searches:
  - Taxonomy
  - Accession
  - Biological status
  - Collecting site
- Advanced search
- Different user-specific export features



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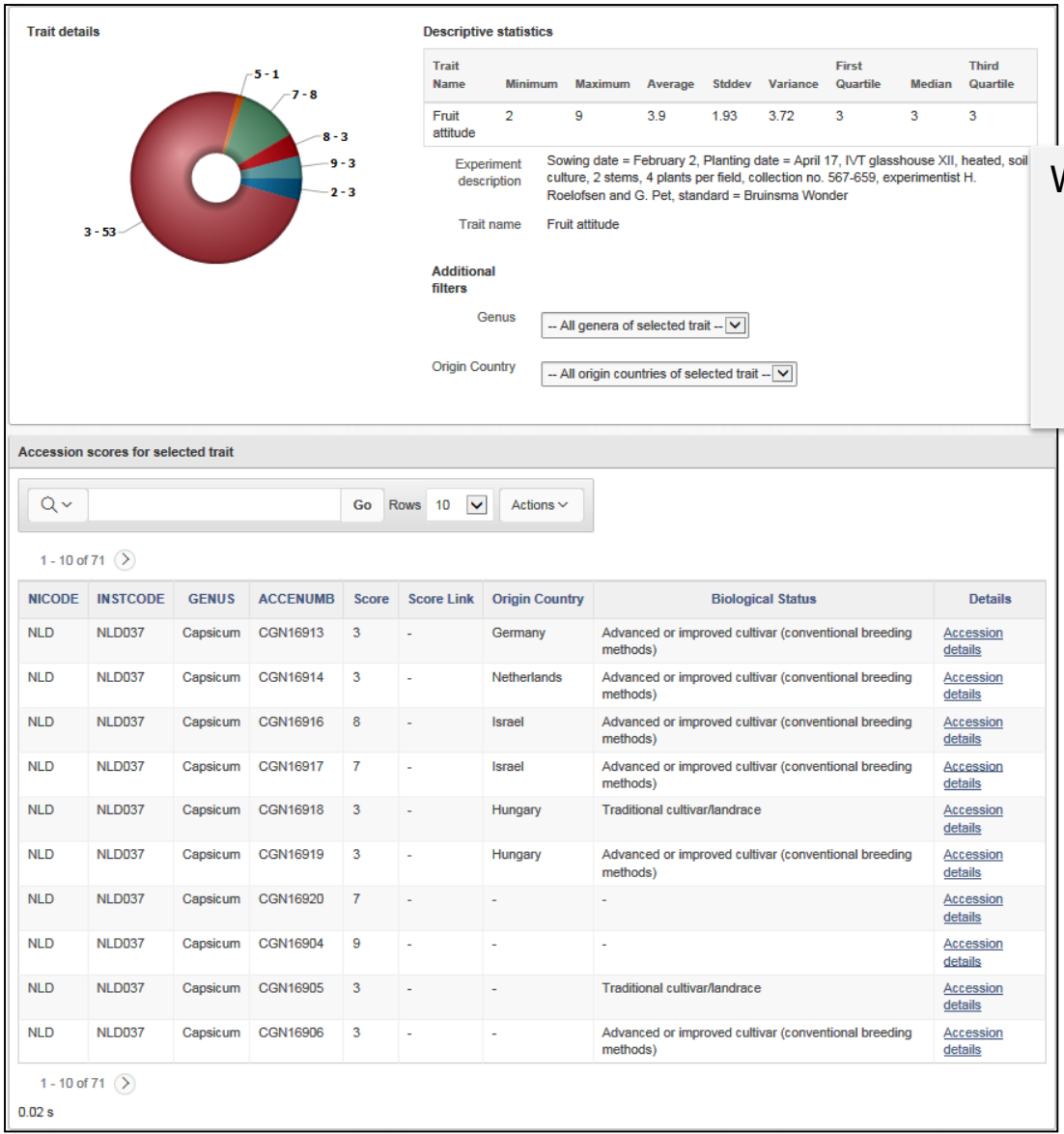
C&E data in EURISCO



Trait details

Descriptive statistics

Trait Name	Minimum	Maximum	Average	Stddev	Variance	First Quartile	Median	Third Quartile
Fruit attitude	2	9	3.9	1.93	3.72	3	3	3

Experiment description: Sowing date = February 2, Planting date = April 17, IVT glasshouse XII, heated, soil culture, 2 stems, 4 plants per field, collection no. 567-659, experimentist H. Roelofsen and G. Pet, standard = Bruinsma Wonder

Trait name: Fruit attitude

Additional filters

Genus: -- All genera of selected trait --

Origin Country: -- All origin countries of selected trait --

Accession scores for selected trait

Go | Rows 10 | Actions

1 - 10 of 71

NICODE	INSTCODE	GENUS	ACCENUMB	Score	Score Link	Origin Country	Biological Status	Details
NLD	NLD037	Capsicum	CGN16913	3	-	Germany	Advanced or improved cultivar (conventional breeding methods)	Accession details
NLD	NLD037	Capsicum	CGN16914	3	-	Netherlands	Advanced or improved cultivar (conventional breeding methods)	Accession details
NLD	NLD037	Capsicum	CGN16916	8	-	Israel	Advanced or improved cultivar (conventional breeding methods)	Accession details
NLD	NLD037	Capsicum	CGN16917	7	-	Israel	Advanced or improved cultivar (conventional breeding methods)	Accession details
NLD	NLD037	Capsicum	CGN16918	3	-	Hungary	Traditional cultivar/landrace	Accession details
NLD	NLD037	Capsicum	CGN16919	3	-	Hungary	Advanced or improved cultivar (conventional breeding methods)	Accession details
NLD	NLD037	Capsicum	CGN16920	7	-	-	-	Accession details
NLD	NLD037	Capsicum	CGN16904	9	-	-	-	Accession details
NLD	NLD037	Capsicum	CGN16905	3	-	-	Traditional cultivar/landrace	Accession details
NLD	NLD037	Capsicum	CGN16906	3	-	-	Advanced or improved cultivar (conventional breeding methods)	Accession details

1 - 10 of 71

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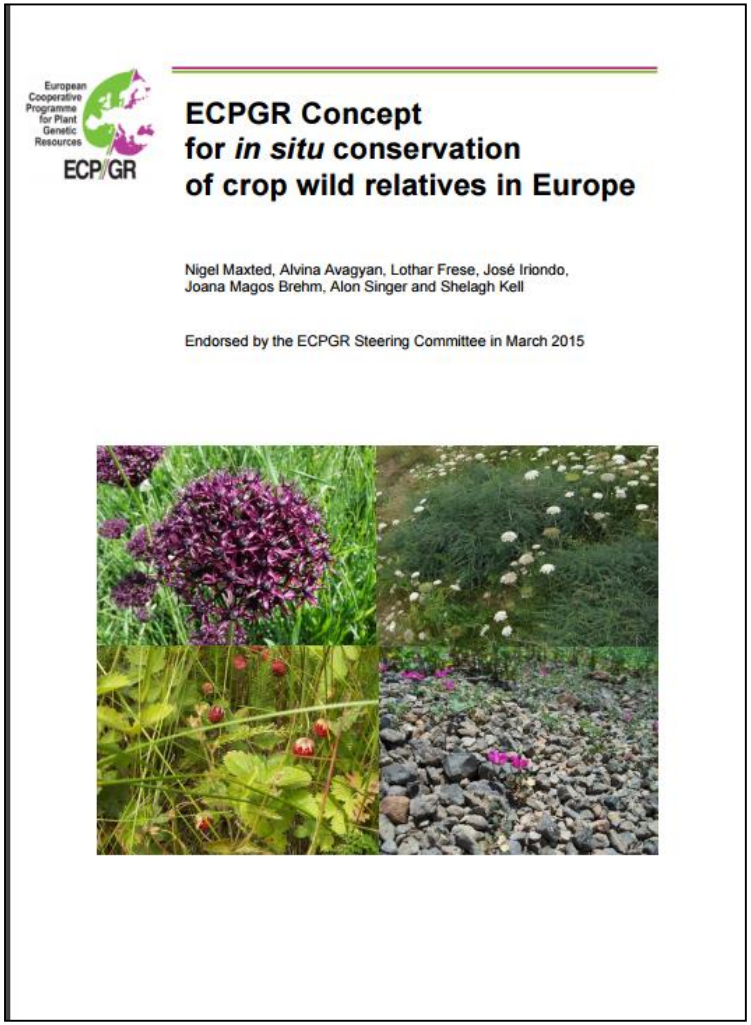
Wizard-based searches for

- Genus
- Species and trait
- Experiment
- Trait

3. Conservation of crop wild relatives

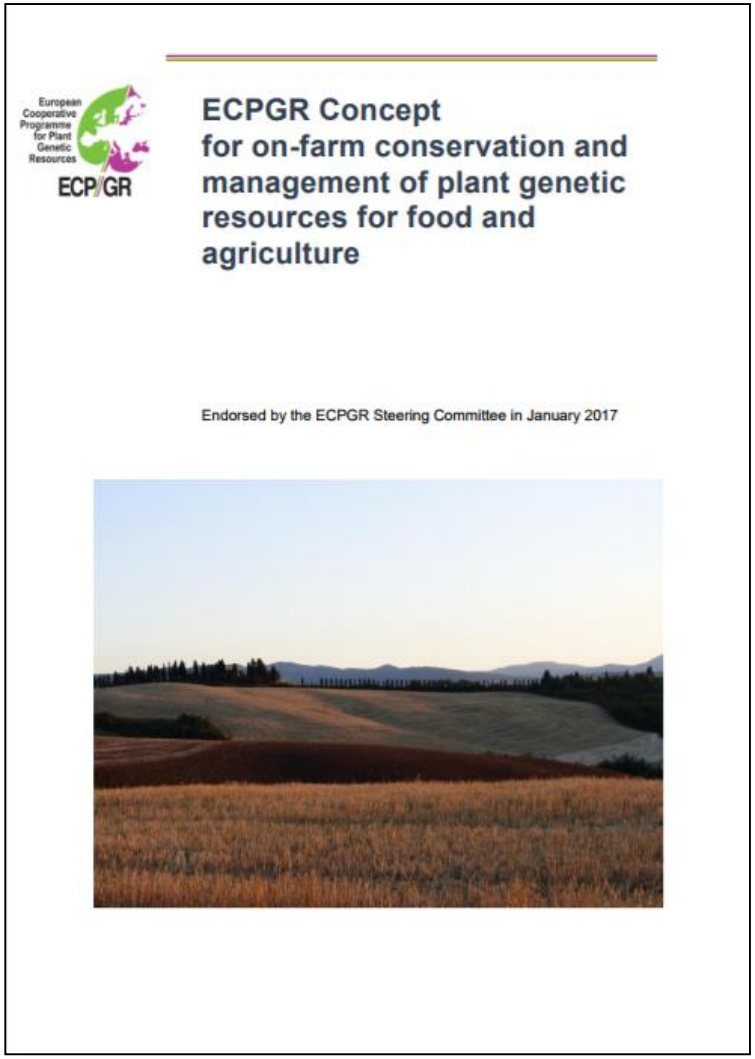
- National and regional conservation strategy planning
  (checklists -> priorities ->
  inventories -> action plans)

- Designation and management of Most Appropriate Wild Populations (genetic diversity and traits of interest) in genetic reserves



4. On farm conservation and management

- European Inventory of on-farm genetic diversity
- Developing indicators for monitoring diversity and threat
- Promoting good practices for on-farm management
- Concept of European agro-diversity sites
- Addressing issues of ownership, access, availability, marketing, etc.



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5. Relations with users

European Evaluation Network (EVA)

The goal of EVA will be to increase, facilitate and improve the use of genetic diversity present in PGRFA in Europe for crop improvement.

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EVA objectives

- To promote crop group-specific European Private Public Partnerships to carry out targeted evaluation of PGRFA;
- To improve the evaluation of PGRFA through coordinated and collaborative efforts, using harmonized methods and standard protocols and the development of best practices, guidelines and tools;
- To promote digitization, harmonization, availability and exchange of existing and newly generated evaluation data

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EVA principles

- In accordance with principles of International Treaty (use of SMTA)
- Use of agreed standards for evaluation
- Use of AEGIS and EURISCO to a maximum extent
- Release of data after an embargo period (Cooperation Agreement)
- Use of ECPGR supportive structure (Secretariat, Working Groups)

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Upcoming call for proposals

TOPIC : Genetic resources and pre-breeding communities

Topic identifier: SFS-28-2018-2019-2020
Publication date: 27 October 2017

Types of action: RIA Research and Innovation action
DeadlineModel: two-stage
Opening date: 16 October 2018
Deadline: 23 January 2019 17:00:00
2nd stage Deadline: 04 September 2019 17:00:00

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B. [2019]: Adding value to plant GenRes (RIA)

- Activities will address processes, tools and know-how associated with a **dynamic management and documentation of GenRes collections** (both ex-situ and in-situ, as appropriate). They will add value to the preserved germplasm to promote its use, e.g. in breeding, farming, forestry and by consumers. Work will enable the development and testing of a range of solutions to enhance quality and efficiency of operations and services across collections. **Major efforts should go into capturing and characterising the genetic diversity in germplasm and revealing novel information to users**. This will include acquiring comprehensive and more precise genotypic and phenotypic information on GenRes material, understanding the connections between the two, how they vary in different environmental contexts and having in place appropriate (bioinformatic) tools for data processing, exchange and visualisation. Due account shall be given to **disclosing the potential of less adapted material** from genebanks/in-situ conservation sites **in relation to valuable traits associated with resilience, adaptability and quality of crops**.
- Proposals should foresee a task for joint activities with other projects financed under this topic.

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Horizon 2020 - SFS 28 2018 GenRes Bridge

- ECPGR-related partners:
  - ECPGR Secretariat; BLE, Germany; WR, The Netherlands; BGCI, UK; INRA, France; Univ. Bham, UK; EURISCO, IPK, Germany; Pro Specie Rara, Switzerland

- ECPGR-related activities:
  - European GRFA integrated strategy
  - Peer-review system for conservation quality assurance
  - AEGIS: involving Botanic gardens; phytosanitary issues
  - EURISCO: Training workshops; linking information systems
  - GenRes Gateway
  - GenRes Journal

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Thank you for your attention