

# Work on Plant Strategy

23 November 2020, 2pm-4pm

## **Objectives and Approaches**

Working Document, section 2

## **Conserving and sustainably using Plant Genetic Resources**

## 2.1 EXPANDING *IN SITU* CONSERVATION OF CROP WILD RELATIVES [AND WILD FOOD PLANTS]

### General Objective:

Europe conserves, using both *in situ* and *ex situ* techniques, and uses the widest breadth of CWR genetic diversity to sustain long-term food security and agriculture, as well as for the provision of ecosystem services, particularly in view of the climate change and other human induced extinction and erosion threats.

***2.1.1 Raising awareness on CWR importance for food and agriculture and embedding its long-term conservation in a consistent policy framework at national and regional levels.***

### Objective:

By 2030, a consistent European policy framework is developed to strengthen and to ensure coordination and harmonization of present and future initiatives dealing with conservation, characterization, evaluation and use of CWR in Europe.

## ***2.1.1 Raising awareness on CWR importance for food and agriculture and embedding its long-term conservation in a consistent policy framework at national and regional levels.***

### **Approach:**

- Raise awareness of national and European governing bodies and agencies of the importance of CWR in promoting sustainable food security and the need for better integration of CWR genetic diversity conservation in the existing policy framework
- Identify all active partners in each country (environmental, agricultural and cultural heritage sectors) to improve coordination and harmonization of activities.
- Encourage all European countries to include CWR conservation in their national programmes, for example developing National CWR conservation and Use Strategies and National CWR Conservation Action Plans

## ***2.1.2 Surveying and inventorying CWR and other wild plant genetic resources for food and agriculture***

### **Objective:**

- By 2030, Europe has made progress towards a more comprehensive view of available CWR genetic diversity, how it is distributed among the EU area and its neighboring countries and which are the priority populations to conserve. This view comprises simple characterization information on CWR gathered by national focal points and transferred to a centralized system, based on agreed standards.
- The European region completes the second IUCN Red List Assessment of the estimated level of threat for the sample set of CWR first assessed in 2011/12 and provides an assessment of their potential risks of genetic erosion over the next years, in terms of population loss.

## ***2.1.2 Surveying and inventorying CWR and other wild plant genetic resources for food and agriculture***

### **Approach:**

- Ensure all European countries complete and publish a national CWR checklists and inventory, identify priority crop gene pools, determine priority CWR to conserve and undertake diversity and gap analysis.
- Where data gaps persist survey CWR diversity to fill remaining gaps in knowledge over the European territory and wherever possible over neighboring countries (existing resources, distribution, level of threat, conservation status).
- Based on genetic diversity and ecogeographic analysis, identify particular hotspots of CWR diversity, to be highlighted for their richness, uniqueness or utility.
- Collectively designate priority CWR populations (MAWPs) which are of interest from either national or European perspective.
- National Focal Points provide standardized data from CWR [and wild food plants] *in situ* conserved populations (National Inventories) to a centralized information system, based on agreed data exchange standards.
- Encourage regular monitoring of the MAWPs demographic and genetic diversity population structure to follow up main erosion trends in their habitats as well as specific threats due to climate change.

### ***2.1.3 Strengthening in situ conservation and management of crop wild relatives [and wild food plants]***

#### **Objective:**

The European countries will set up and manage a network for *in situ* management of MAWPs as part of an integrated CWR conservation strategy for Europe in which active and sustainable long-term *in situ* conservation actions are implemented at national level.

#### **Approach:**

- Establish a network of CWR genetic reserves at the national and regional level based on the designations of MAWP and the proposals from local, subnational, national and European competent authorities.
- A series of tools under development, including guidelines for the *in situ* management of CWR populations is agreed and then implemented by national and European CWR MAWP to manage CWR populations. These will include quality standards and reporting requirements, and entailing periodic reviews based on a set of monitoring indicators.
- Undertake further research on the *in situ* management of CWR populations outside of existing protected areas.

## ***2.1.4 Improving the conservation/utilization link***

### **Objective**

By 2030, make well characterized CWR genetic resources accessible to users, increasing the support and capacities for use of CWR in pre-breeding and research on CWR genetic diversity and useful traits.

### **Approach**

- Ensure AEGIS is extended to encompass both *ex situ* and *in situ* conserved CWR populations.
- Apply the existing MAWP *in situ* population guidelines to ensure complementary *ex situ* conservation of MAWPs populations for all *in situ* conserved CWR populations.
- Increase efforts to characterize and evaluate *in situ* conserved germplasm, using as much as possible standardized criteria.
- Provide access to *in situ* conserved germplasm through the use of SMTA via *ex situ* collections and, when required, enabling direct access to CWR populations, subject to national provisions.
- Improve the availability of *in situ* conservation, characterization and evaluation data to end users through a centralized documentation system such as or linked to EURISCO.
- Encourage inclusion of germplasm accessions, from each MAWP in the AEGIS *ex situ* European Collection, subject to national access legislation or other regulatory measures, and that they are well characterized for wide distribution and use.

## 2.2 On-farm Conservation and Management

### *2.2.1 Surveying and inventorying on-farm plant genetic resources for food and agriculture*

#### **Objective:**

By 2030, an inventory of on-farm landrace diversity and their associated owners (individuals or consortia) is completed for all European countries and kept up to date.

#### **Approach:**

- Based on the methodology defined in the first inventory produced in the framework of the Farmers' Pride project and on the FAO guidelines and, enriching it with the cooperation of additional partners and countries as well as with the inclusion of crops not yet covered, a complete European Inventory of on-farm genetic diversity will be established.



## ***2.2.1 Surveying and inventorying on-farm plant genetic resources for food and agriculture***

### **Approach:**

- This inventory will include agreed passport and characterization data as well as effective indicators for monitoring genetic diversity and threats.
- The inventory will also acknowledge the material owners - individuals and/or consortia - as effective contributors to National and European plant strategies.
- Specific on-farm National Focal Points nominated by National Coordinators will be set up to consolidate present National strategies and develop the link among actors from each sector/Strategy. This will facilitate the Inventory, ensure the regular survey of material in collaboration with farmers and alert in case of serious threat on material.
- The on-farm National Inventory may be used to aid environmental stewardship grants, as examples of good practice for the public good preservation of locally adapted genetic diversity.

## ***2.2.2 Supporting on-farm conservation, management and use of plant genetic resources for food and agriculture***

### **Objective:**

By 2030,

- Required conservation measures for landrace diversity are implemented, including *ex situ* backups, and wider access and use of existing diversity is promoted at local and national level.
- Good practices for on-farm management and adding value are promoted and facilitated through appropriate legislation.

## ***2.2.2 Supporting on-farm conservation, management and use of plant genetic resources for food and agriculture***

### **Approach:**

- Relying on current knowledge available to conserve landraces, technical guidelines for long term conservation and management will be drafted for the various crop and used for implementation.
- Hot spots of landraces diversity are identified for priority action: incentives to farmers for continued maintenance; public awareness about local diversity; safety backup in *ex situ* genebanks; research and monitoring carried out on best practices and genetic diversity trends.
- A database of knowledge and evidence-based practices, related to successful experiences of conservation and sustainable use of landraces in Europe is maintained and expanded and the best practices are publicized and promoted.
- Efforts are made to reintroduce landraces from genebanks to their locations of origin and in home gardens, in collaboration with local communities.
- Legal and technical obstacles to on-farm conservation, management and use are identified and solutions proposed to overcome barriers.

## 2.3 CONSOLIDATING AND SUSTAINING EX SITU CONSERVATION

### *2.3.1 Strengthening ex situ conservation capacities in Europe*

#### Objective:

By 2030, the PGR in European genebanks are conserved reliably and made accessible for sustainable use by improving the efficiency and efficacy of the current European genebank infrastructure.

Thus the European ex situ conservation systems will be raised to a level of excellence in terms of:

- quality of conservation,
- coverage of regional diversity,
- accessibility to bona fide users,

thereby positioning Europe as a primary contributor to the global conservation and use effort.

### ***2.3.1 Strengthening ex situ conservation capacities in Europe***

**Approach**: Reinforce and expand AEGIS, the framework for the maintenance and development of the European Collection.

- Establishment of a ***certification system***, based on AQUAS, with ***standards*** and a (external) ***monitoring system***.
  - AEGIS will consist of (parts of) collections of certified genebanks.
  - Materials are reliably conserved and fully accessible (under STMA)
- Creating capacity building and facility improvement mechanisms that support genebanks to achieve the levels needed for AEGIS certification
- Avoid acute loss of European PGR by:
  - Addressing urgent regeneration needs and safety duplication backlogs, for *ex situ* conserved diversity
  - Backing up diversity *in situ* and on-farm in ex situ facilities in collaboration with actors in these sectors and/or by setting up collecting missions

## ***2.3.2 Expanding the coverage of genetic diversity in European genebanks***

### **Objective:**

The PGR in European genebanks ***conserve and provide access to appropriate samples of the genetic diversity*** that has occurred and/or is still occurring in European agriculture and the diversity needed for plant breeding to adapt European agriculture to future needs.

## ***2.3.2 Expanding the coverage of genetic diversity in European genebanks***

### **Approach:**

- Create and maintain an overview of plant genetic diversity occurring in Europe and its conservation *status*
  - establishment and regular updates of an inventory of agricultural diversity in Europe
- Create and maintain an inventory of diversity needed in Europe in the short, mid and long term to meet the needs of all agricultural communities
  - establishment and regular updates of a communication platform involving the user communities to inventory current and anticipated needs
- Acquire the needed diversity to prevent loss and allow use
  - organization of collecting activities, primarily in Europe
- Conserve and provide access to the diversity
  - By depositing it in AEGIS certified genebank

## 2.4 PROMOTING SUSTAINABLE USE

### *2.4.1 Expanding phenotyping, genotyping and evaluation of Eur. PGRFA*

#### **Objective**

Promote targeted phenotypic and genotypic evaluation of European PGRFA and improve digitization, harmonization, availability and exchange of existing and newly generated evaluation data of PGRFA for private and public actors.

#### **Approach**

Coordinated and collaborative efforts at all levels, including within the framework of the ECPGR EVA network, promote the use of European PGRFA by:

- Using harmonized methods and standard protocols for characterization and evaluation,
- Using innovative tools to discover and test useful traits contribut. to Food Security & Sust. Agric.
- Establishing of European PPP
- Digitizing and making available from centralized system relevant data
- Transferring knowledge and ideas among genebanks, crop research and breeding communities, including farmers' associations.



## ***2.4.2 Supporting use of CWR genetic resources in pre-breeding and in research for the discovery of useful traits***

### **Objective**

Achieve a more coordinated and systematic use of CWR genetic diversity for crop improvement and in research.

### **Approach**

- Complement the ECPGR EVA network with phenotyping, genotyping, evaluation and pre-breeding programmes of CWR
- Facilitate systematic research on CWR genetic diversity and their potentially useful traits.
- Identify priority crops where the introduction of CWR in research and breeding is a pressing need.
- Enhance the capacities in utilising CWR genetic resources in pre-breeding.
- Enhance communication of advances, best practices, opportunities, etc. in using CWR in pre-breeding, germplasm enhancement programmes and the discovery of useful traits.
- Promote the development of a global data portal for the exchange and provision of CWR data.
- Strengthen the link with (the developing) *in situ* (network of) conservation sites through supporting the targeted selection of populations of specific interest for breeding to increase the availability of these resources.

### ***2.4.3 Supporting use of PGRFA in participatory and decentralised breeding efforts for the development of innovative locally adapted dynamic populations***

#### **Objective**

Support the integration of farmers and other civil society actors in breeding for diversity processes. Promoting participatory and decentralised breeding within the construction of alternative, local food networks, will increase crop genetic diversity in space (e.g. different farms will grow different varieties) and time (e.g. on farm diversity will evolve during the time).

#### **Approach**

- Supporting public/private agreements for facilitating regeneration/multiplication of PGRFA for increased use by the civil society);
- Promoting at local, national and EU level collaborative projects involving *ex situ* and civil society actors based on participatory and decentralised breeding;
- Enlarging the approach to on farm conservation including participatory and decentralised breeding;
- Supporting dedicated projects with organic farmers organisations for developing heterogeneous materials for organic agriculture;
- Studying a new form of open source license for dynamic populations.

## **2.4.4 Facilitate availability to all stakeholders of genetic diversity from European *ex situ* and *in situ* conservation sites**

### **Objective**

Assure access to well documented genetic diversity conserved *ex situ* and *in situ* in Europe.

### **Approach**

- Strengthen national and regional genebanks/genetic resource centers to act as access points and as knowledge centers regarding the legal aspects of access to PGRFA.
- Improve access to information on PGRFA conserved both *ex situ* and *in situ* by developing public national/regional/European information systems.
- Formally recognize CWR populations for conservation in genetic reserves and document information on them in publicly available user-friendly information systems.
- Set up routines for access to PGRFA conserved *in situ* via storage of seeds in genebanks and/or via controlled sampling from *in situ* locations when needed.
- Strengthen cooperation between the *ex situ* and *in situ* conservation sector (nature conservation stakeholders, NGOs working with on-farm conservation and farmer organizations).
- Support NGOs and user genebanks working with genebanks on access to PGRFA.
- Support the development of policy instruments at the national level to facilitate access to PGRFA conserved *in situ*.
- Provide access to easily understood documentation on the rights and obligations when signing an SMTA.

## ***2.4.5 Promoting diversification of crop production and consumption of crop diversity by consumers for sustainable and more resilient agri-food systems***

### **Objective**

A diversified European agricultural and horticultural production for the benefit of sustainable food production, improved health and well-being, and long-term management of PGRFA.

### **Approach:**

- Identification and removal of disincentives
- Development and introduction of incentives

## 2.5 STRENGTHENING A COMPREHENSIVE INFORMATION SYSTEM FOR PGRFA

### ***2.5.1 Strengthen and support the Eurisco NFP network to ensure the provision of passport data for all accessions of National collections***

#### **Objective:**

- By 2030, the EURISCO infrastructure of National Focal Points is optimally supported.
- By 2030, EURISCO contains high quality passport data of *ex situ* collection holders, progressively extended to actively managed *in situ* CWR populations and appropriate on-farm landraces data.

## ***2.5.1 Strengthen and support the Eurisco NFP network to ensure the provision of passport data for all accessions of Nat<sup>l</sup> collections***

### **Approach:**

- Increase capacity and assure commitment of the PGR holders and NFPs to provide high quality data to EURISCO through capacity development including continuous training.
- Create and maintain a comprehensive inventory of PGR conserved in Europe which should be included in EURISCO, expanding data coverage, quality and standardization of *ex situ*, *in situ* CWR and, as appropriate, on-farm conserved PGR.
- Promote the development of standardized descriptors for the exchange of relevant data about on-farm landraces, aiming to complement EURISCO with such data..

## ***2.5.2 Increase availability of reliable characterization and evaluation data through Eurisco***

### **Objective:**

- By 2030, NFPs provide to EURISCO publicly available quality phenotypic and, as appropriate, genotypic data, collected through standardized ways and in collaboration with various public and private partners.

## ***2.5.2 Increase availability of reliable characterization and evaluation data through Eurisco***

### **Approach:**

- Create, promote and support the adaptation of standards and tools allowing harmonised collection and documentation of several phenotypic data:
  - adaptation of defined standards for phenotypic data,
  - platform for curation of PGR related ontology terms,
  - training NFPs.
- Include all publicly available harmonised phenotypic datasets into EURISCO, through:
  - Curation of existing phenotypic data sets in Eurisco,
  - Support of NFPs, genebanks/institutions and companies to adopt new technology and upload data in Eurisco.



### ***2.5.3 Assure interoperability of Eurisco with other systems by adopting the FAIR<sup>1</sup> principles***

#### **Objective:**

- By 2030, all data in EURISCO are FAIR to allow a better use by a wide community of users across sectors and domains.
- By 2030, the EURISCO governance and management of data is adapted to reach a high level of professionalism in the arena of European and Global open-access databases.

<sup>1</sup> FAIR: Findability, Accessibility, Interoperability, Reusability

### ***2.5.3 Assure interoperability of Eurisco with other systems by adopting the FAIR<sup>1</sup> principles***

#### **Approach:**

- The infrastructure needed to make PGR data FAIR is established
- Genebanks and NFPs are given access to the technology:
- Several convincing demonstration cases are created to show the huge potential of the technology to encourage its deployment
- NFPs will be trained to reach and maintain a high level of professionalism
- The governance of Eurisco will be strengthened to accompany the deployment of FAIR principles and its link to other public databases