

BETA WG REPORT (2024–2025)

In preparation for the 18th Steering Committee Meeting, Tbilisi, Georgia, 2-4 June 2026

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1. CONTRIBUTION TO ECPGR OBJECTIVES

1.1. Achievements and success stories

- To efficiently conserve and provide access to unique germplasm in Europe through AEGIS and the European Collection
n/a
- To provide passport and phenotypic information of actively conserved European PGRFA diversity *ex situ* and *in situ* through the EURISCO catalogue
n/a
- To improve *in situ* conservation and use of crop wild relatives
n/a
- To promote on-farm conservation and management of European PGRFA diversity
n/a
- To promote use of PGRFA
 - In Armenia, additional collecting missions were organized, leading to the identification of new natural habitats and the inclusion of new *Beta* crop wild relative (CWR) accessions in the long-term *ex situ* collection of the National Genebank of Crops and their Wild Relatives of ANAU (Armenia). Regeneration activities were carried out for *Beta* CWR material, and 46 accessions were characterized, including *Beta lomatogona* F. et M., *Beta macrorhiza* Stev., and *Beta corolliflora* Zoss species. A total of 46 *Beta* CWR accessions were safely duplicated and deposited in the genebanks of ICARDA and SGSV for secure long-term conservation. The corresponding passport data for these accessions were made publicly available through the GENESYS portal. Some of the conserved Genebank accessions were further analyzed through genotyping approaches based on protein profiling and DNA markers, enabling a more detailed assessment of their genetic variation.
 - In Austria, a new sugar beet reference genome was prepared and published by BOKU University in Vienna, to facilitate the interpretation of sequence-based data from wild beets. The assembly, called RefBeet-3.0, was built using long-read sequencing data, and various additional genomic resources. RefBeet-3.0 comprises 648Mbp in nine pseudochromosomes and further sequences with an N50 size of 61.5Mbp. The gene BeetSet-3 set consists of 28,271 genes of which 25,824 could be functionally annotated based on sequence homology. The

assembly is highly complete and has a high sequence accuracy in absolute terms and in comparison, to existing sugar beet assemblies. RefBeet-3.0 and BeetSet-3 will serve as comprehensive resources for future studies on wild beets, as well as for breeding activities.

- In Greece, new collecting expeditions took place in 2025, and 12 new accessions of *Beta* CWRs were added in the *ex situ* collection of the Greek Genebank (ELGO-DIMITRA), including *Beta vulgaris* subsp. *adanensis* Aellen, *Beta macrocarpa* Guss. and *Beta vulgaris* subsp. *maritima* (L.) Arcang. Regeneration and characterization of CWR of *Beta* species were implemented and trials for their evaluation were conducted. Greece is one of the 18 partners from 11 countries involved in the Horizon Europe project "PRO-WILD: Protect and promote crop wild relatives", which aims to identify priorities for *in-situ* conservation of the selected CWR gene pools (including *Beta* CWRs), survey and complement CWR genebanks collections, increase the conservation of PGRFA and enhance the utilization of CWRs in crop improvement, thereby contributing to the achievement of the objectives outlined by ECPGR. PRO-WILD will compile and analyze CWR occurrence maps and perform new collections. It will predict the vulnerability of several CWR species and populations to ongoing climate changes and investigate the resilience of CWR collections (including beets) for relevant biotic and abiotic stresses.

1.2. Gaps or constraints identified

The ECPGR activities need a continued, engaged and trusting cooperation between the members of the networks, which is beyond their official engagements and obligations. Even if their intention is to contribute to the fulfilment of the objectives of ECPGR, they usually don't have the essential time to succeed.

Moreover, the members' participation in the ECPGR Activity Grant Scheme projects depends on their country's eligibility for funding (some members cannot participate in ECPGR Activity Grant Scheme projects due to their country's funding eligibility restrictions).

Considering the above constraints, the time investment for the submission and implementation of the proposals in relation to the low budget, other funding opportunities might seem more tempting than the ECPGR Activity Grant Scheme projects.

2. GRANT SCHEME ACTIVITIES, WG MEETINGS AND EVA ACTIVITIES

- **Grant Scheme proposals (submitted:0; approved:0)**
- **Total number of partners involved in Grant Scheme: n/a**
- **Meetings held**
 - None
- **Total number of partners involved in WG Meeting: n/a**
- **Reports and related data**
 - None
- **Funds mobilized**
 - None

3. OTHER ACTIVITIES (CROSS-WORKING GROUP ACTIVITIES, LINKS WITH OTHER NETWORKS, PROJECTS AND INITIATIVES)

- **Cross-Working Group activities:**
- **Others:**
 - **PRO-WILD** project, Horizon Europe topic '*Crop Wild Relatives for Sustainable Agriculture*' (HORIZON-CL6-2023-BIODIV-01-13), co-funded by EU, UK and Switzerland.
The project "Protect and promote crop wild relatives" started in 2024 and will end in 2029. The overarching goal of PRO-WILD is to protect and conserve CWR of wheat, sugar beet, and oilseed rape, both in their natural habitats and in genebanks, harnessing their valuable traits to improve nutritional quality and resilience to biotic and abiotic stresses. The project will also catalogue beneficial traits, making them accessible to breeders and researchers. PRO-WILD outcomes will contribute to the European Green Deal initiatives through research, education and training. It will serve the EU Biodiversity and Farm to Fork strategies by preserving, characterizing and utilizing wild species that have unique importance for the resilience of our food systems.
 - **Preservation of plant genotype by creating a DNA-bank** project, funded by Higher Education and Science Committee of RA.
The objective of the project was to establish a DNA bank comprising valuable and endangered native crop varieties and their wild relatives, including beet varieties and *Beta* CWRs. The initiative aims to preserve DNA fragments and genetic profiles of these materials, thereby supporting their application in plant biotechnology and breeding programmes.
 - **Regeneration of Crop Diversity and Safety Duplication at the Svalbard Global Seed Vault** project, funded by The Crop Trust.
The objective of the project was to conserve, regenerate, and securely duplicate Armenia's plant genetic resources (including beet) to safeguard global agrobiodiversity.

Members of the *Beta* WG coordinate or participate in the above projects. This establishes close collaborations between the WG on *Beta* and other teams and allows for tuning the ECPGR objectives with the overarching activities of these projects.

4. WORKING GROUP DOCUMENTS AND PUBLICATIONS

DOCUMENTS

- None

PUBLICATIONS

- Dohm JC, Holzweber T, Pensch RA, Himmelbauer H. Sugar beet long-read reference assembly of genotype KWS2320. 2025. NAR Genom Bioinform.57(4): lqaf142. doi: 10.1093/nargab/lqaf142.

5. EXPECTED ADDITIONAL ACHIEVEMENTS AND FUTURE ACTIVITIES

- Plans to carry out comprehensive genotyping of all accessions maintained in the Armenian genebank.
- **Bytes4Beets** project. A DAFNAE UNIPD (Italy) postdoctoral researcher has been awarded a Marie Skłodowska-Curie Actions Global Postdoctoral Fellowship for the

implementation of the project. The project focuses on identifying climate-resilient traits in wild relatives of sugar beet to strengthen breeding strategies capable of withstanding rising temperatures and environmental stress, thereby contributing to food security and climate adaptation. The outgoing phase will be carried out at the University of Western Australia, followed by the return phase at DAFNAE UNIPD.

- **HALO-FORCE** project is about to be launched. This new PRIMA project, coordinated by DAFNAE UNIPD (Italy), focuses on protecting and restoring Mediterranean wetlands, which are increasingly threatened by climate change, salinization, and land degradation. HALO-FORCE explores the potential of wild halophytes (*Salicornia europaea* L., *Salsola soda* L., and *Beta vulgaris* subsp. *maritima* L. Arcangeli) to develop nature-based and sustainable solutions supporting biodiversity, climate resilience, and food security, combining scientific research with field validation and stakeholder involvement.
- **PRO-WILD** project will be continued. In the framework of this project new trials will be conducted in Greece (ELGO-DIMITRA) and other member countries to investigate the resilience of *Beta* CWRs collections for abiotic and biotic stresses. The beneficial traits will be catalogued, making them accessible to breeders and researchers. The identification of CWR-derived desired traits and their transfer into elite backgrounds will be done to promote CWR use. Overall, PRO-WILD specific goals will be coordinated with input from breeders, farmers, and consumers.