ON-FARM CONSERVATION AND MANAGEMENT WG REPORT FOR PHASE X (2019-2023)

Submitted to the 17th Steering Committee Meeting, Oeiras, Portugal, May/June 2023
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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*
  In course of achievement through the actions of the BiDifferent Activity.

- *To provide passport and phenotypic information of actively conserved European PGRFA diversity* ex situ *and* in situ *through the EURISCO catalogue*
  The passport information is updated by each country's National Focal Point in the EURISCO catalogue. EURISCO isn't ready yet to include on-farm landraces data.

- *To improve* in situ *conservation and use of crop wild relatives*
  Achieved through the implementation of the Farmer's Pride project.
  In the framework of the Farmer's Pride project, funded by the Horizon 2020 Programme of the European Union (http://www.farmerspride.eu/) a proposal of a set of criteria for evaluating the efficiency of a network in securing and giving access to *in situ* landrace diversity was produced https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/10/MS4_Network_efficiency_criteria_for_LR_access.pdf

- *To promote on-farm conservation and management of European PGRFA diversity*
  Achieved through the implementation of the Activities BiDifferent and INWHEATORY.
  Also, in the framework of the Farmer's Pride project, a tool was produced for promoting landraces *in situ* conservation. Developed for landrace maintainers, or those considering the cultivation of landraces to diversify their crop production system, it includes examples of *in situ* management practices and of adding value to landraces. It provides access to evidence-based information on the benefits, opportunities and practices of landrace cultivation to help in decision-making and to promote their *in situ* maintenance as a means of conserving and diversifying plant genetic resources for food, nutrition and livelihood security https://www.ecpgr.cgiar.org/in-situ-landraces-best-practice-evidence-based-database
  In the frame of the Farmer's Pride project, a catalogue of landrace *in situ* occurrences was developed that includes information on more than 19,335 geo-referenced landrace cultivation sites of 141 herbaceous and 48 tree species from 14 European countries. Analyses of the catalogue revealed that 19.8% of total occurrences are located in protected areas of the Natura 2000 network.

- *To promote use of PGRFA*
  Achieved through the implementation of the BiDifferent and INWHEATORY Activities. Also, in the framework of the Farmer's Pride project, *in situ* landrace propagation management and access guidelines were produced https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/09/D2.4_In_situ_landrace_propagation_management_guidelines.pdf
  Achieved through the permanent activities of the genebanks' curators

1.2. Gaps or constraints identified

- The COVID-19 pandemic caused a lot of constraints in the implementation of the activities of Phase X and difficulties to organize meetings that could help the close collaboration between the Working Group members.
- Slow rate in the inclusion of accessions in the European Collection. EURISCO is not ready yet to include on-farm landraces data.

2. GRANT SCHEME ACTIVITIES, WG MEETINGS AND EVA ACTIVITIES

- **Grant Scheme proposals (submitted:4; approved:2 (November 2021 and December 2022))**
  - Chances for the conservation and re-cultivation of central European club wheat (Binkel) through a nutritional and genetic differentiation towards other wheat species (BiDifferent) (in collaboration with the Wheat WG, 5th call)
  - Inventorying wheat on-farm diversity (INWHEATORY) (in collaboration with the Wheat WG, 6th call)

- **Total number of partners involved: 22 from 14 countries**
  - ECPGR-funded: 16 from 12 countries
  - Self-funded: 8 from 3 countries

- **Meetings held**
  - BiDifferent kick-off meeting, 14-15 July 2022, Innsbruck, Austria

- **Reports and related data**
  The Association for the Conservation and Recultivation of Crops VERN e. V., published a web page on the BiDifferent project available at https://landsorten.de/bidifferent/

- **Funds mobilized** [shared with Wheat WG]
  - ECPGR granted funds: € 65,230 [shared with Wheat WG]
  - Inputs in-kind declared in Grant activities: € 6,300 [shared with Wheat WG]

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

- **Cross-Working Group activities**:

- Two proposals were submitted and were/will be implemented in collaboration with the Wheat WG
  - BiDifferent
  - INWHEATORY
- Two virtual meetings were organized with all working group chairs:
  - Meeting of the Working Groups Chairs and the Executive Committee, 5-6 April 2022 (online)
  - Meeting of the Working Groups Chairs and the Executive Committee, 8-9 March 2023 (online)

- **Others: International Projects and Initiatives**
  - Farmer's Pride project (H2020 – SFS-04-2017)
    The project Farmer's Pride 'Networking, partnerships and tools to enhance *in situ* conservation of European plant genetic resources' https://more.bham.ac.uk/farmerspride/ started in 2017 and ended in 2021. The main objective of Farmer's Pride was to establish a network of stakeholders and conservation sites that effectively coordinates conservation actions to safeguard the wealth of Europe's *in situ* PGR and integrates the user community to maximize their sustainable use.
  - 6th Scientific Meeting for Landraces and Indigenous Varieties - Exploring the world of crop landraces http://www.landraces6meet.web.auth.gr/index.php/en/. Organized by the Aristotle University of Thessaloniki (Greece) (Deanship of the Faculty of Agriculture, Forestry and Natural Environment, School of Agriculture and School of History and Archaeology) and Co-organized by the Greek Genebank-IPGRB-ELGO-DIMITRA, UOOFNG, LIRA, KEDEK, ERC, PLANTCULT, 31 May-1 June, Thessaloniki, Greece.
  - GRAINEFIT, PR-166-Serbia project (Benefit-sharing Fund of the International Treaty of Plant Genetic Resources for Food and Agriculture)
    The project 'Redesigning the exploitation of small grains genetic resources towards increased sustainability of grain-value chain and improved farmers' livelihoods in Serbia and Bulgaria' of the Benefit-sharing Fund of the International Treaty of Plant Genetic Resources for Food and Agriculture (GRAINEFIT, PR-166-Serbia), 2020-2023, aims to preserve, evaluate and reintroduce local small grains landraces and varieties that are more resilient to climate changes and suitable to low input agriculture. The data on wheat landraces, obsolete cultivars and conservation varieties that have been retrieved from local farmers and genebanks and analyzed within the project, will contribute to the proposed national inventories. https://www.fao.org/plant-treaty/areas-of-work/benefit-sharing-fund/projects-funded/bsf-details/en/c/1198871/?iso3=SRB
  - DYNAVERSITY H2020 – SFS-04-2017 Grant Agreement n. 773814 The project, started in 2017 and ended in 2021, analyzed and described the actors involved in plant genetic conservation for agriculture in order to suggest management and governance models and to construct new forms of networking. http://dynaversity.eu/project/ Members of the On-farm Conservation and Management WG coordinate or participate in the above projects and initiatives.
  - GENRES BRIDGE H2020 "Genetic resources for a food-secure and forested Europe" (Jan 2019-Dec 2021). GenRes Bridge aimed to strengthen conservation and sustainable use of genetic resources of plant, animal and microbial origin. http://www.genresbridge.eu/

Members of the On-farm Conservation and Management WG coordinate/d or participate/d in the above projects and initiatives.

4. WORKING GROUP DOCUMENTS AND PUBLICATIONS

- Almeida MJ, Pinheiro de Carvalho MAA, Barata AM et al 2022. Crop landraces inventory for Portugal. Genet Resour Crop Evol 70:1151–1161. https://doiorg/101007/s10722-022-01492-6
- Bebeli P, Biniari K, Stavrakaki M, Bouza D, Ralli P, Thanopoulos R. 2022. Local and indigenous agricultural varieties: knowledge and practices. National Inventory of Intangible Cultural Heritage of Greece, Ministerial Decree Reference Number 300792.
- Caproni L, Raggi L, Ceccarelli S, Negri V, Carboni A. 2019. In-depth characterisation of common bean diversity discloses its breeding potential for sustainable agriculture. Sustainability (Switzerland), 11(19). doi: 10.3390/su11195443
- Caproni L., Raggi L, Talsma E F Wenzl, P & Negri V. 2020. European landrace diversity for common bean biofortification: a genome-wide association study. Scientific Reports, 10(1), 1–13. doi: 10.1038/s41598-020-76417-3
- Khan AR, Goldringer I, Thomas M 2020. Management practices and breeding history of varieties strongly determine the fine genetic structure of crop populations: a case study based on Eeuropean wheat populations. Sustainability 12:613. https://doi.org/10.3390/su12020613
- Maxted N, Hunter D, Ortiz Ríos R 2020 Plant Genetic Conservation. Cambridge University Press. https://doi.org/10.1017/9781139024297
- Raggi L, Pacicco LC, Caproni L, Álvarez-Muñiz C, Annamaa K, Barata AM, Batir-Rusu D, Díez MJ, Heinonen M, Vojtěch Holubec, Kell S, Kutnjak H, Maierhofer H, Poulsen G, Prohens J, Ralli P, Rocha F, Rubio Teso ML, Sandru D, Santamaria P, Sensen S, Shoemark O, Soler S, Străjeru S, Thormann I, Weibull J, Maxted N, Negri V. 2022. Analysis of landrace cultivation in Europe: A means to support in situ conservation of crop diversity. Biological Conservation. Volume 267, 109460, ISSN 0006-3207, https://doi.org/10.1016/j.biocon.2022.109460.
- Raggi L, Caproni L, Negri V. 2021. Landrace added value and accessibility in Europe: what a collection of case studies tells us. Biodivers Conserv 30, 1031–1048, https://doi.org/10.1007/s10531-021-02130-w
- Raggi L, Ceccarelli S, Negri V. 2022. Genomics of a barley population evolved on-farm under different environmental conditions. Agroecology and Sustainable Food Systems, 00(00), 1–30. doi: 10.1080/21683565.2022.2106011
- Ruņģis D, Leino MW, Lepse L, Goreta Ban S, da Vahl E, et al 2021. Genetic characterization of European potato onion (Allium cepa var aggregatum G. Don) collections. Genet Resour Crop Evol 68:657–665. https://doi.org/10.1007/s10722-020-01014-2
- Tagiakas RI, Avdikos ID, Goula A, Koutis K, Nianiou-Obeidat I, Mavromatis AG 2022. Characterization and evaluation of Greek tomato landraces for productivity and fruit quality traits related to sustainable low-input farming systems. Front Plant Sci 13:994530. https://doi.org/10.3389/fpls.2022.994530

- Farmer's Pride products:
  - Three issues of "Landraces" newsletter (2019-20) https://www.ecpgr.cgiar.org/working-groups/on-farm-conservation/landraces-newsletter
  - *In situ* landrace propagation management and access guidelines https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/09/D2.4_In_situ_landrace_propagation_management_guidelines.pdf,

- *in situ* landraces: best practice evidence-based database https://www.ecpgr.cgiar.org/in-situ-landraces-best-practice-evidence-based-database,
- *in situ* PGR in Europe: landraces https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/06/D1.2_in_situ_PGR_in_Europe_landraces.pdf,
- Landrace hotspots identification in Europe https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/10/D1.4_Landrace_hotspots_identification_in_Europe.pdf,
- Proposal of a set of criteria for evaluating the efficiency of a network in securing and giving access to *in situ* landrace diversity https://more.bham.ac.uk/farmerspride/wp-content/uploads/sites/19/2020/10/MS4_Network_efficiency_criteria_for_LR_access.pdf
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5. EXPECTED ADDITIONAL ACHIEVEMENTS AND FUTURE ACTIVITIES THAT COULD CONTRIBUTE TO THE IMPLEMENTATION OF THE PGR STRATEGY FOR EUROPE

The On-farm Conservation and Management WG could undertake the following activities proposed to be included in Phase XI that could contribute to the implementation of the objectives and targets of the PGR Strategy for Europe:

- Develop or improve an ECPGR Portal compiling links to existing national on-farm conservation and management strategies, programmes and initiatives.
- Carry out a survey to identify and describe ongoing on-farm PGR conservation and use examples at national and regional level.
- Set up a task force involving EURISCO/Documentation and Information WG/On-farm WG to design the structure and requirements for a European Inventory of on-farm landraces and provide training workshops for identifying material to be inventoried in the platform.
- Reach agreement at ECPGR level on conservation and management guidelines for on-farm landraces, based on the work done by the WG, in collaboration with stakeholders that are engaged in diverse conservation and management schemes.
- In collaboration with Crop WGs, assess and remedy gaps in *ex situ* genebanks, including through collecting missions and coordinate the safety back-up for selected on-farm landraces.