

An Integrated European *In Situ* Management Workplan
Implementing Genetic Reserve and On-Farm Concepts



Wild species related to crops (crop wild relatives, or CWR) and the landraces of a wide range of crops are indispensable resources for assuring the adaptability of agricultural production systems. The *in situ* management of CWR and landrace populations is the fundamental precondition that guarantees a sustainable management of current genetic diversity and the evolution of genetic diversity that is required for tomorrow. Consequently, EU policy on biodiversity has called for the strengthening of *in situ* management programmes.

How can this objective be implemented in practice? This leaflet summarizes the results of a three-year project, provides answers and suggests a way forward.





Rationale

- Crop wild relatives (CWR) and landraces are an invaluable genetic resource widely used in crop enhancement programmes.
- CWR use is likely to be extended due to the requirement for greater breadth of diversity to mitigate the negative impact of climate change.
- CWR and landraces are threatened and neglected genetic resources.
- CWR species have been widely ignored by the *in situ* protected area community who prioritises rare and threatened species.
- CWR make up a very small proportion of plant genetic resources for food and agriculture (PGRFA) stored in genebanks in Europe and very few CWR are adequately conserved *ex situ*.
- Unlike crops, many CWR cannot be maintained adequately outside their natural habitat.
- CWR lack conservation attention both in the plant biodiversity and agrobiodiversity community.
- There are concepts but no tested procedures and techniques for systematic management of CWR and landraces *in situ* within the EU.

Objectives

- Development of in situ management workplans for CWR and landrace conservation.
- Development of methods to identify the richest areas in landrace and agro-ecosystem diversity.
- Recommendation of sites suited for the establishment of genetic reserves for selected model crops (*Avena*, *Beta*, *Brassica*, *Prunus*).
- Description of the organizational, legal and technical framework conditions for genetic reserves in the project partner countries.
- Development of procedures required to establish multi-CWR-species sites to allow maximum use of the recommended sites.
- Development of technical guidelines and quality standards for genetic reserves.
- Development of database tools required for population management and monitoring and integration of these tools in existing information systems.
- Elaboration of a methodology for the generation of *in situ* management strategies based on existing generic methodologies and experiences extracted from the four model crops and landrace studies.
- Raise awareness of the value of *in situ* conservation of CWR in genetic reserves and crop landraces in on-farm systems.





Results

CWR In Situ Strategy Helpdesk

<http://aegro.bafz.de/index.php?id=188>

Genetic reserve conservation may be defined as “the location, management and monitoring of genetic diversity in natural wild populations within defined areas designated for active, long-term conservation” (Maxted N, Ford-Lloyd BV, Hawkes JG (1997) (eds): in: Plant genetic conservation: the in situ approach, p. 20-55, Chapman & Hall, London). The online accessible helpdesk is a guide and information facility for those involved in the development of a CWR *in situ* conservation strategy. There are three main components of this facility:

- A step-wise methodology for the identification of genetic reserve sites for a target crop gene pool.
- A step-wise methodology for the identification of genetic reserve sites for a national CWR flora.
- A list of data sources that can be consulted to aid the development of a CWR *in situ* conservation strategy.

Crop Wild Relative Information System – AEGRO Population Level Information System

<http://aegro.bafz.de/index.php?id=168>

For each case study crop a separate database and portal is provided and can be used to search for occurrences by taxon and for a combined search for occurrences by geographic information (i.e., Eurostat administrative units: NUTS - nomenclature des unités territoriales statistiques, LAU – local administrative units; protected areas). The results can be displayed on a map or downloaded as lists.

Crop case studies

In situ management workplans for CWR conservation were produced for *Avena*, *Beta*, *Brassica* and *Prunus* to illustrate the application of a clear, step-wise methodology that can be applied to other crop gene pools in the future.



Landraces: A strategy to identify areas suited to manage a high amount of landrace diversity was developed and successfully tested in a case study area.



Prunus: Ecogeographic data compiled for the complete geographic range in Europe will allow reserve sites to be identified. Two of them are located in the UK and Germany.



Beta: Six taxa distributed within the EU were prioritized and so far a total of 15 reserve sites recommended. A monitoring baseline for *B. patula* was established.



Brassica: Five taxa distributed within the EU were prioritized and so far a total of 23 reserve sites recommended. For *Brassica macrocarpa* a monitoring baseline was established.



Avena: The EU level case study arrived at the conclusion that genetic reserves should be established for 5 species.





Synthesis and Perspectives

The locations of the genetic reserves proposed for *Avena*, *Beta*, *Brassica* and *Prunus* were placed together in a Geographic Information System that provided an overall picture of the selected sites. Procedures required establishing multi-CWR-species sites to allow maximum use of the recommended sites were developed and assessed. Furthermore, a set of quality standards for genetic reserve establishment and management was produced.

The genetic reserve concept is a technically feasible conservation technique. The establishment of a genetic reserve network covering the most relevant crops and CWR native to Europe requires a broader application of AEGRO methodologies, experiences and tools into the working groups of the European Cooperative Programme for Plant Genetic Resources (ECPGR). They represent the users' interests and are the driving forces that can turn AEGRO, which started as a project, into a joint programme for *in situ* management of CWR and landraces in Europe.

For further information, visit the project website:

<http://aegro.bafz.de/index.php?id=95>

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