

***In situ* conservation of wild plants for food and agriculture by means of umbrella species in Germany (IsWEL)**

Fact sheet of the model and demonstration project IsWEL

A model and demonstration project in the field of conservation and innovative sustainable use of biological diversity, financially supported by the German Federal Ministry of Food and Agriculture (BMEL) through the Federal Office for Agriculture and Food (BLE), grant number 2819BM040.



Project duration: 01 July 2020 – 31 December 2023

Motivation

In the project, the focus is on wild plants for food and agriculture (in German "**W**ildpflanzen für **E**rnährung und **L**andwirtschaft" = WEL), i.e. crop wild relatives and species potentially useful for food and agriculture, which are often not covered by conservation measures. For the extension of the German network of genetic reserves, we will identify WEL umbrella species, nominate WEL hotspots for the establishment of genetic reserves (GR) and implement GR in model regions. By focusing on WEL hotspots and following the umbrella species approach, in which several species are benefiting from management for some specific species, the project aims to conserve as many WEL as possible with as few resources as necessary. A GR is defined as an area designated for active and permanent conservation measures and on which management and monitoring of the genetic diversity of naturally occurring wild plant populations takes place. Conservation actions will be prioritized for species of putative economic importance following the recommendation of the German Advisory and Coordination Committee on Genetic Resources of Agricultural and Horticultural Crops (BEKO), which set up a list of priority species (134 taxa). The GR conservation technique was tested in several projects (wild celery, wild apple, wild grape vine, grassland), which always started from a narrow species spectrum or similar biotopes. In contrast to these projects, the focus is now on WEL hotspots in different biotopes. Thus, the project has a considerably broader and fundamentally new approach compared to previous projects. Since the long-term financing of GR in Germany has not yet been secured, recommendations for structural financing of GR will be developed.

Target species: Crop wild relatives and species potentially useful for food and agriculture (WEL), in particular those which, according to the BEKO, should be given priority as an important resource for plant breeding

Project aim: Efficient conservation and facilitated access to plant genetic resources through

- Systematic identification of hotspots of WEL species in different biotopes
- Testing and implementation of the umbrella species concept in these hotspots
- Characterisation of selected hotspots and evaluation of management
- Establishment of GR at these hotspots
- Storage of seed samples in the Genbank WEL (more information see <https://genbank-wel.uni-osnabrueck.de>)
- Recommendations on structural financing for *in situ* conservation of WEL

Procedure

First, we will collect information on the location of WEL species in Germany, compile a nationwide inventory list and identify WEL species hotspots. The species frequency, sensitivity to disturbances

and number of sympatric occurrences with other species will be used to calculate the umbrella species index according to Fleishman et al. (2000, 2001) for WEL species in hotspots. Using further criteria based on Jedicke (2016), WEL umbrella species will finally be determined. Subsequently, about 100 hotspot areas containing umbrella species will be selected as candidates for GR. For approximately 30 of the areas, observations on site will take place in the summer of 2021 to assess the WEL and to evaluate the conservation status and management of the umbrella species. From two representative umbrella species, leaf samples of several occurrences will be collected for the investigation of genetic differentiation patterns. Based on the evaluation and the results of the genetic analysis, areas will be nominated for the establishment of GR by 2023. Relevant funding opportunities will be evaluated and proposals for measures and financing for the *in situ* conservation of WEL will be developed. For areas for which the establishment of a GR will be proposed, site specific conservation plans for the WEL occurrences, the collection of seed samples for storage in the Genbank WEL and the consultation with local stakeholders will be realised in order to establish at least 15 GR.

Project partner

- Julius Kühn Institute (JKI) – Federal Research Centre for Cultivated Plants, Institute for Breeding Research on Agricultural Crops (Quedlinburg, Germany)
Dr. Nadine Bernhardt and M. Sc. Maria Bönisch
➔ Project coordination, identification of WEL hotspots and WEL umbrella species, genetic analysis, planning and establishment of genetic reserves
- Hochschule Anhalt (HSA) – Anhalt University of Applied Sciences, Department Agriculture, Ecotrophology and Landscape Development (Bernburg, Germany)
Prof. Dr. Sabine Tischew, M. Sc. Thomas Engst and M. Sc. Vera Senße
➔ Identification of WEL hotspots and WEL umbrella species, development of a genetic reserve scenery, characterisation of WEL occurrences and evaluation of existing management for selected sites
- Hochschule Geisenheim University (HGU), Department of Landscape Planning and Nature Conservation & Competence Center Cultural Landscape (CULT)
Prof. Dr. Eckhard Jedicke and Dr. Martin Reiss
➔ Evaluation of funding programmes and suggestions for actions and financing

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