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Collection of Hop Genetic Resources in the Czech Republic

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The National Programme on Conservation and Utilization of Plant, Animal and Microbial Genetic Resources Important for Food and Agriculture

Biodiversity protection has long been one of the most important environmental issues not only in the Czech Republic but also worldwide. In the Czech Republic (CR), the Ministry of Agriculture (MoA) is responsible for the protection of biodiversity (= genetic resources = GR) which is of great importance for food and agriculture. In view of the above, MoA announced "The National Programme on Conservation and Utilization of Plant, Animal and Microbial Genetic Resources Important for Food and Agriculture" (NPGR) (=National Programme) in 1993 in order to ensure sustainable conservation, availability and use of genetic resources important for food and agriculture that are located in the Czech Republic. This Programme has received not only formal but also financial support from the Czech Republic – through the MoA. It is announced on a multi-annual basis, each programme being partly amended according to current needs and state of knowledge in the field of conservation of genetic resources.

The basic objective of the National Programme:

To ensure the long-term conservation of the GR of plants, animals, micro-organisms and small invertebrates important for food and agriculture, in accordance with national legislation, international obligations and the needs of users of genetic resources, and for the sustainable development of agriculture in the CR, adapting to climate change and maintaining the quality of rural areas.

In order to achieve the basic objective, the following goals have been set:

- 1) To ensure the protection and long-term storage of GR included in the National Programme using appropriate and up-to-date conservation methods.
- 2) To collect historical, present and new GR important for food and agriculture that are located in the CR, including the repatriation of original Czech materials from abroad, and to rationally enlarge collections of GR with new material from abroad in accordance with the needs of their users.
- 3) To enhance the evaluation and characterization, i.e. to gain the knowledge of properties, traits and genetic diversity of GR and to assess their use for improving the biological potential and utility value of plant varieties, species and breeds of animals and strains of microorganisms.
- 4) To keep clear records and documentation on the GR conserved and provided, including the international exchange of information.
- 5) To guarantee the availability of GR stored in the CR for users and provide both the GR and relevant information to domestic and foreign users in accordance with national and European legal requirements and other international obligations.
- 6) To create the conditions for the efficient and sustainable use of GR in line with the needs of agricultural practice, commodity processors and consumers and to support the environmental functions of agriculture and adaptation to climate change.
- 7) To guarantee the international commitments of the CR in this area and thus participate globally in protection of agrobiodiversity and the fair and equitable sharing of benefits resulting from its use.

Collection of Hop Genetic Resources

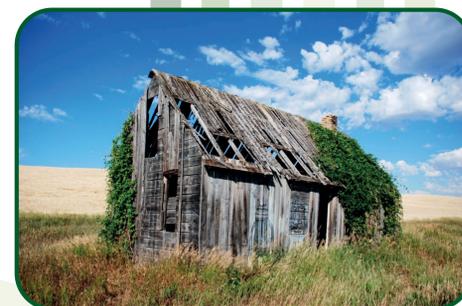
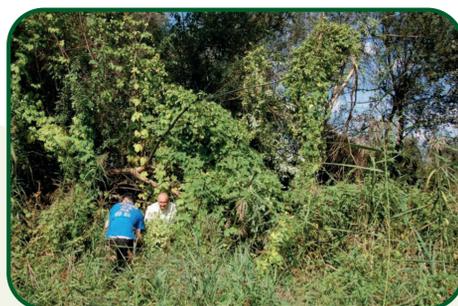
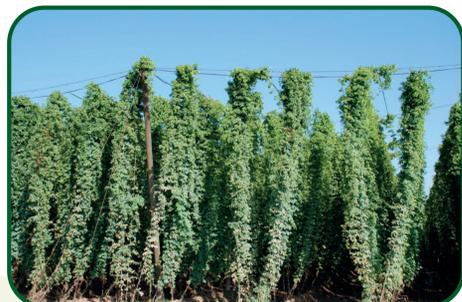
Hop Research Institute has two rich collections of genetic resources. The first collection contains hop varieties grown all over the world in the frame of "National Program of Conservation and Utilization of Genetic Resources in Plants and Biodiversity" issued by Czech Ministry of Agriculture. There are 380 items, which represent old and new hop cultivars, which serve as donors of important characteristics within the breeding process. The second collection contains wild hops, which have been regularly collected since 1997. There are 295 items from Europe (128), North America (73) Caucasus (76) and eastern parts of Russia (18). Wild hops show genetic, chemical and phenotypic variability. It is necessary to bring wild hops from habitats into field conditions to find out if demanded features are based genetically and not just influenced by environment. Assessment is carried out at least for five years and each genotype is planted there in three replicates, which are evaluated individually. All the characteristics are transferred into the information system with the help of our classifier.

Since July 2015, Hop Research Institute has been operating the National documentation system on PGR GRIN Czech (currently in English only). This new system, adapted to the Czech Republic from a globally recognized system of documentation of genetic resources GRIN Global, was provided to CRI by the workplace USDA / Agricultural Research Service (National Germplasm Resources Laboratory, Database Management Unit, Beltsville). GRIN Global was developed from the original documentation system GRIN in cooperation with USDA Agricultural Research Service, Biodiversity International and the Global Crop Diversity Trust.

Documentation of PGR, which leads in accordance with § 17 of Decree No. 458/2003 Coll. person in charge of the National Programme, consists of:

- a) passport data – the general characteristics of plant genetic resources which are common to all PGR. Currently, the applicable standard is the document Multi-Crop Passport Descriptors (MCPD).
- b) characterized and evaluation data – assessment of morphological, biological, and biochemical characteristics in the form of descriptors, which are genus or species-specific and are evaluated according to the specific descriptors list (classifier) indicating the method of evaluation of expression of each character.
- c) storage data – basic storage information is provided for all samples of genetic resources (number of items, date of harvest, date of start of preservation, date of recovery, conservation method and others). Data are also recorded about provided samples to users.

The first collection is utilized within our breeding process as well as for research and study works and each item is available for every Czech and foreign workplace in all the forms (plants, dry cones, leaves, DNA). Ministry of Agriculture supports genetic resources in the form of grant called "National Program of Conservation and Utilization of Genetic Resources in Plants and Biodiversity". The second collection is utilized just by Hop Research Institute for breeding purposes because the Institute has invested into the expeditions from its own sources and therefore these items are not at disposal. The collection is the basis for hop breeding for drought resistance.



Acknowledgement

This work was supported by part of project NAZV QK21010136 entitled "Application of new hop varieties and genotypes resistant to drought in hop growing and beer brewing" and a part of "National Program of Conservation and Utilization of Genetic Resources in Plants and Biodiversity (51834/2017-MZE-17253/6.2.1) issued by Czech Ministry of Agriculture.