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ITEMS FROM THE CZECH REPUBLIC

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An improvement of the genebank management system in the Czech republic.

Ludmila Papousková and Vojtech Holubec.

The existing documentation system for genetic resources in the Czech Republic, EVIGEZ, has not met the requirements of modern documentation systems (documentation of sets of characterization data, including molecular data, image analysis, and other aspects), so we currently are moving to a new documentation system, GRIN Global.

For proper data migration, first we needed to analyse the structure of two databases to avoid losing any recorded information. Although both systems contain parts for passport, characterization, and inventory data, they have different structures. The GRIN Global system allows, in most cases, more detailed information about genetic resources, for example, the recording of germination tests. In EVIGEZ, only the initial germination and subsequent records of germination test were recorded and stored outside the system in Excel tables. Now, it is possible to convert these records collectively to a database. System components also should report on the need for regeneration of material if germination reaches the critical value, contributing to more accurate control of the stored material.

The structure of the two systems of characterization and evaluation data did not differ significantly, however, a big advantage is the possibility of recording more sets of observation data relating to a single accession.

The greatest problem of data migration was, in our case, the transfer of taxonomic data. GRIN taxonomy does not fully correspond with the taxonomy in EVIGEZ. The GRIN system does not cover all taxa and synonyms and does not recognize lower taxonomic classification (to variety). However, EVIGEZ data can be transformed into GRIN Global without losing detailed taxonomy data using taxonomic synonyms.

Part of the GRIN Global system is a website of the database that will be used for all information and ordering genetic resources on-line via a shopping cart setup. Until now, it was possible to order genetic resources held in the Czech Republic only through e-mail.

This change of genebank management systems will help improve the quality of work in the genebank and, thus, improve the quality of service for users of genetic resources.

Germplasm conservation and seed longevity in the Czech genebank.

Vojtech Holubec and Ludmilla Papousková.

Seed longevity is a function of temperature and relative humidity. Decreasing moisture content by 1% results in a doubling of longevity. However, longevity depends on many factors, mainly the biologic quality of seed, pre- and post-harvest treatment, storage conditions, and gas composition. Seed genetic resources have been kept in the Genetic Resources

Department at the Crop Research Institute, Ruzyne, since it was establisted in 1951. The initial 6,000 accessions were received from the organizations between 1880–1950. Samples in CRI Ruzyne genebank were stored in metallic boxes in the basement and regularly regenerated in 5-year periods. Selected materials from the base collection were stored in commercial cold storage since 1985. Germination ability was regularly counted but not recorded in the EVIGEZ information system (Table 1). The new Genebank opened in 1989 and filled subsequently with materials from the commercial cold store and with newly regenerated material. Historiacal landmarks of the Czech Genebank include

Table 1. Viability of wheat in storage before establishment of the Czech Genebank.

1985 winter wheat	1952–62	1963	1964	1968
Viable accessions	834,788	2	25	131
Storage years	19–27	18	17	13
%	0	1.4	18.0	91.0

- 1898–1950: early breeding and state variety testing institutes keep collections of landraces and cultivars mainly for their own use.
- 1951: Crop Research Institute founded, including the Department of Genetic Resources, 6,000 samples accepted from various sources before foundation of the CRI, including breeders, variety testing institutes, and other collections for storage.
- 1960s: seed stored in metallic boxes in the basement of a building and regenerated at intervals of 3–5 or 8 years.
- 1981–84: electronic documentation system EVIGEZ developed.
- 1985: climatized storage, selected items in commercial cold storage (2,200 accessions), ability to enter germination counts.
- 1889–90: Czech Genebank founded; 2,200 accessions moved from commercial cold storage and newly regenerated material added.

At present, there are data on seed longevity available for 23–28 years ending with the last germination tests in 2014 (Table 2). The standard germination ability of the 60 oldest wheat accessions did show an increase in germination by 2% from the initial 95.3%. Similarly, 44 winter barley accessions showed a 12% decrease in germination compared to the initial 89.8%, most likely because of lower initial quality. In legumes, 365 bean accessions showed a 1.2% decrease from the mean initial germination of 92.1%, and 212 pea accessions showed a 14.6% increase from the initial mean gennination of 74.1%. The oldest 60 accessions of Cruciferae species *Brassica napus*, *B. rapa*, and *Sinapis alba* had the same germination rate, as did triticale. The germination increase in pea possibly is due to dormancy, because this atribute was not originally counted in the germination rate.

Table 2. Viability of selected crops after 19–28 years of storage in the Czech Genebank (checked in 2014).

Crop	#	Initial germination	Germination difference (%)	Years
Triticum L.	60	95.3	–2.0	23–28
xTriticosecale (winter type)	26	89.2	0.0	20
Hordeum L. (spring type)	44	89.8	11.9	20
Phaseolus L.	365	92.1	1.2	19
Pisum sativum L. convar. *sativum*	212	74.1	–14.6	19
Brassica napus L. var. *napus*	48	78.9	–0.1	20
Brassica napus L. f. *bennis*	16	79.5	0	20
Sinapis alba L.	6	72.6	0	20