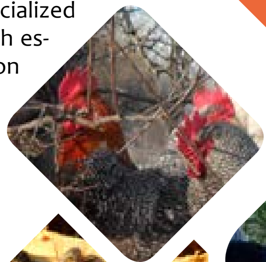
APICULTURE

Our primary task is to establish the central breeding (gene bank) population of the Pannon bee in Hungary, as well as to carry out genetic preservation and breeding coordination tasks. Genetic diversity studies have begun based on morphological examinations. The development of in vitro semen storage methods has started, which may enable artificial insemination using frozen sperm. In recent years, we have determined the apicultural importance of numerous plants (acacia, sunflower, linden, phacelia). Our beekeeping product test laboratory also functions as a research and service laboratory. During the classification of honey, sensory properties, physicochemical characteristics, and pollen composition are determined.

EDUCATION

HGI participates in undergraduate and postgraduate specialized trainings - theoretical and practical aspects alike - through established departmental agreements with higher education institutions. Numerous undergraduate (TDK), BSc, MSc, and PhD theses are produced in our institution. As part of environmental education, we provide informative sessions from preschool age onward and prepare high school students for research competitions.



EXPERT ADVICE

In cooperation with breeding organizations we engage in coordination and consultation activities necessary for breed protection, genetic preservation, farm utilization, dissemination, and maintenance of endangered livestock breeds for rural development and production purposes.

PRODUCT SALES AND LABORATORY SEVICES - GÖDÖLLŐ

1. **Juvenile Hungarian Giant rabbits from various lines of the gene bank population are available for purchase**
2. **As the largest maintainer of native poultry breeds in the country, NBGK HGI conducts sales of breeder eggs and day-old poultry from certain breeds for the public and businesses during spring.**
3. **The Department for Apiculture and Bee Biology conducts honey quality and other bee health investigations.**
4. **The Department for Small Animal Research and Gene Conservation Biology performs genetic and reproductive biology laboratory investigations, and it is able to determine the genetic profile of falconry birds.**

SEED DISTRIBUTION / SEED REQUEST – TÁPIÓSZELE

The genebank in Tápiószele offers a possibility to ask for samples from the genetic resources preserved by our institute. The National Centre for Biodiversity and Gene Conservation publishes a list of currently available samples on its website each year and anybody can request seed samples with special conditions

GUIDED TOUR

Individuals and groups interested in our activities are welcome to visit the National Centre for Biodiversity and Gene Conservation throughout the year by appointment. During our guided tour you can learn about the specific aims and practices of gene conservation and see the different steps of the genebank's activities in Tápiószele and Gödöllő. The guided tour is free of charge in both locations.

CONTACT

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NEMZETI BIODIVERZITÁS – ÉS GÉNMEGŐRZÉSI KÖZPONT

The National Centre for Biodiversity and Gene Conservation (NCBGC) was established on 1 June 2019 as the base institution for gene conservation in Hungary, through the merger of the former NöDiK (Centre for Plant Diversity) in Tápiószele and the HáGK (Livestock Gene Conservation Centre) in Gödöllő. Biodiversity or biological diversity means the diversity of life on Earth including the variety of habitats, species and also means genetic variation within a given species combined. The protection of genetic resources – with special regard to the preservation of the genetic reserves of cultivated plants and livestock – is a high priority national task all over the world regulated by international treaties setting specific commitments such as the Convention on Biological Diversity or the International Treaty on Plant Genetic Resources for Food and Agriculture of the Food and Agriculture Organization of the United Nations. Our country is a statutory party to both conventions.

PLANT GENE CONSERVATION INSTITUTE, TÁPIÓSZELE

The major duty of the National Centre for Biodiversity and Gene Conservation is the implementation of the basic national gene bank tasks related to the preservation of field crops and vegetables. The institute performs complete gene bank activities including the development of the national gene bank collections, their agrobotanical characterization, documentation and distribution besides their medium and long term preservation in cooled seed storage rooms, plantations or in some cases through in vitro cultures. Further tasks include organization and coordination related to the conservation of Hungarian landraces and ecotypes – well adapted to the local conditions – at their original production sites ("in situ" or "on-farm") and the arrangement and implementation of seed collection activities. In addition the activities of the institute also cover the preservation of the genetic resources of wild vascular plants, fruit trees, grape and ornamentals.

DIFFERENT METHODS FOR THE PRESERVATION OF PLANT GENETIC RESOURCES

1. **Ex situ conservation:** conservation in gene banks out of the original site, which can be
   - traditional conservation in seed collections, plantations or fields, or;
   - preservation by other new methods and in vitro maintenance.
2. **In situ conservation:** preservation and – in some cases – restoration of the viable populations of plant species, varieties and cultivars at their original sites in their natural environment. Within the in situ method farmer based or on farm conservation can be used for the natural preservation and utilization of landraces (cultivars adapted to the ecological conditions of a given region) at those original production sites where their characteristic traits developed.

The seed collections of the National Centre for Biodiversity and Gene Conservation are preserved in cooled storage rooms with temperatures of 5-8°C and -20°C. The Base collection provides long-term preservation of genetic resources, where the storage temperature is -20°C. The expected lifespan of accessions preserved in this way may even exceed 100 years. Active collections are stored at a temperature of 5-8°C, and expected storage lifespan reaches 20-30 years. Here collections used for the distribution of genetic resources, analysis and research purposes can be found. Both storage methods are based on slow, gentle drying of the seeds to very low humidity and then sealing them in an airtight, moisture-proof container. The National Centre for Biodiversity and Gene Conservation operates 15 active and 4 base storage chambers for the preservation of its seed collections

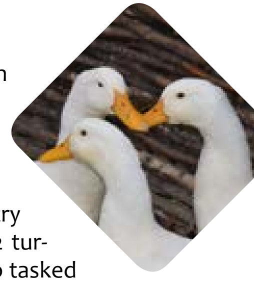
Conservation method	Crop groups	Number of unique accession
Seed bank	Cereals	21 376
	Vegetables	10 739
	Grain legumes	10 002
	Industrial crops	3 040
	Forage legumes	2 823
	Grasses	2 298
	Herbs	1 163
	Other*	687
	Wild species of Pannon Seed Bank	2 064
Vegetative preservation	Onions	209
	Tuber crops	63
In vitro collection	Potato and its wild species	709
Field collections	Fruit trees	1 051
	Ornamentals	996
	Grape	161
In total:		57 381

*Ornamentals, roots, fruits

INSTITUTE FOR FARM ANIMAL GENE CONSERVATION - GÖDÖLLŐ

The NBGK – Institute for Farm Animal Gene Conservation serves as the dedicated center for livestock genetic preservation in Hungary and it is a member of the European Genebank Network for Animal Genetic Resources (EUGENA). Its activities cover the entire spectrum of native farm animal preservation, including gene bank populations and deep-freezing (in vitro) storage of germplasm, coordinating genetic preservation and conducting essential scientific research. It also provides expert consultancy and educational programs. The genetic resources of our native farm animal populations could serve as the basis for future breeding efforts, contribute to the proper utilization of changing agricultural habitats, participate in the desirable management of natural habitats, and provide basis for healthy food production.

FARM ANIMAL BREED PROTECTION



The institute contributes to the preservation of genetic diversity through the maintenance of traditional animal breeds that have developed in the Carpathian Basin. For nearly 30 years, the institute has served as a state gene bank, maintaining 14 poultry breeds (including 7 chicken, 1 guinea fowl, 2 turkey, 2 duck, and 2 goose breeds). We are also tasked with the maintenance of various sheep breeds (such as Hungarian racka, gyimes racka, cikta, cigája, and mountain berke), Hungarian plain goat, Hungarian gray cattle, Carpathian brown cattle, and Hungarian plain donkey. Concerning aquatic ecosystems and wetlands our goal is to preserve the genetic diversity of Tench (Tinca tinca) and Crucian carp (Carassius carassius) in the institute's fishponds. These species are not yet protected but are disappearing from many habitats. Work has begun for the preservation of the critically endangered European mudminnow (Umbra krameri). It is of utmost importance to establish the nucleus population of the Hungarian Giant Rabbit in the gene bank and to showcase our activities to the public.

RESEARCH AND DEVELOPMENT

The institute's responsibilities include research and development activities related to genetic preservation, small animal breeding, and GMO-free feeding. HGI's internationally unique in vivo gene bank populations, covering all farm animal species, form the basis for establishing and maintaining in vitro gene banks through molecular genetic studies (diversity and origin investigations, pedigree verification), reproductive biology and in vitro genetic preservation research (sperm, embryonic cell, and gonadal tissue storage). In vitro gene bank research extends beyond poultry species and breeds to include honeybees, rabbits, various Hungarian horse breeds, and other Carpathian Basin sheep and cattle breeds.