
UKRAINE

# The Plant Genetic Resources System of Ukraine

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# *Structure of Plant Genetic Resources System of Ukraine*

- The Plant Genetic Resources System of Ukraine is subordinated to the National Academy of Agrarian Sciences of Ukraine and consists of the National Centre for PGRU (NCPGRU) and 28 research institutions.

*Due to the Russian aggression, 4 research institutions were annexed in 2014 and 3 were occupied in 2022.*

- The NCPGRU is the scientific, methodological and coordination center of the Plant Genetic Resources System of Ukraine, which maintains the information system on PGRU, houses the main long-term seed storage facility, organizes the development of methods for the formation of base, core, trait and other types of collections, trait classifiers, catalogues of accessions and other scientific and methodological developments.
- The NCPGRU is a subdivision of the Yuriev Plant Production Institute which legally concludes contracts and supports the activities of the Centre.

The Yuryev Plant Production Institute of the National Academy of Agrarian Sciences
Performs the Functions of Three Centers:

- ✓ Center for Plant Genetic Resources of Ukraine

- ✓ Scientific and Methodological Center for the Coordination of Sunflower Research and the Support of Breeding Programs for 15 Field Crops

- ✓ Eastern Interregional Scientific Center of the National Academy of Agrarian Sciences

# The main activities of the PGR System of Ukraine

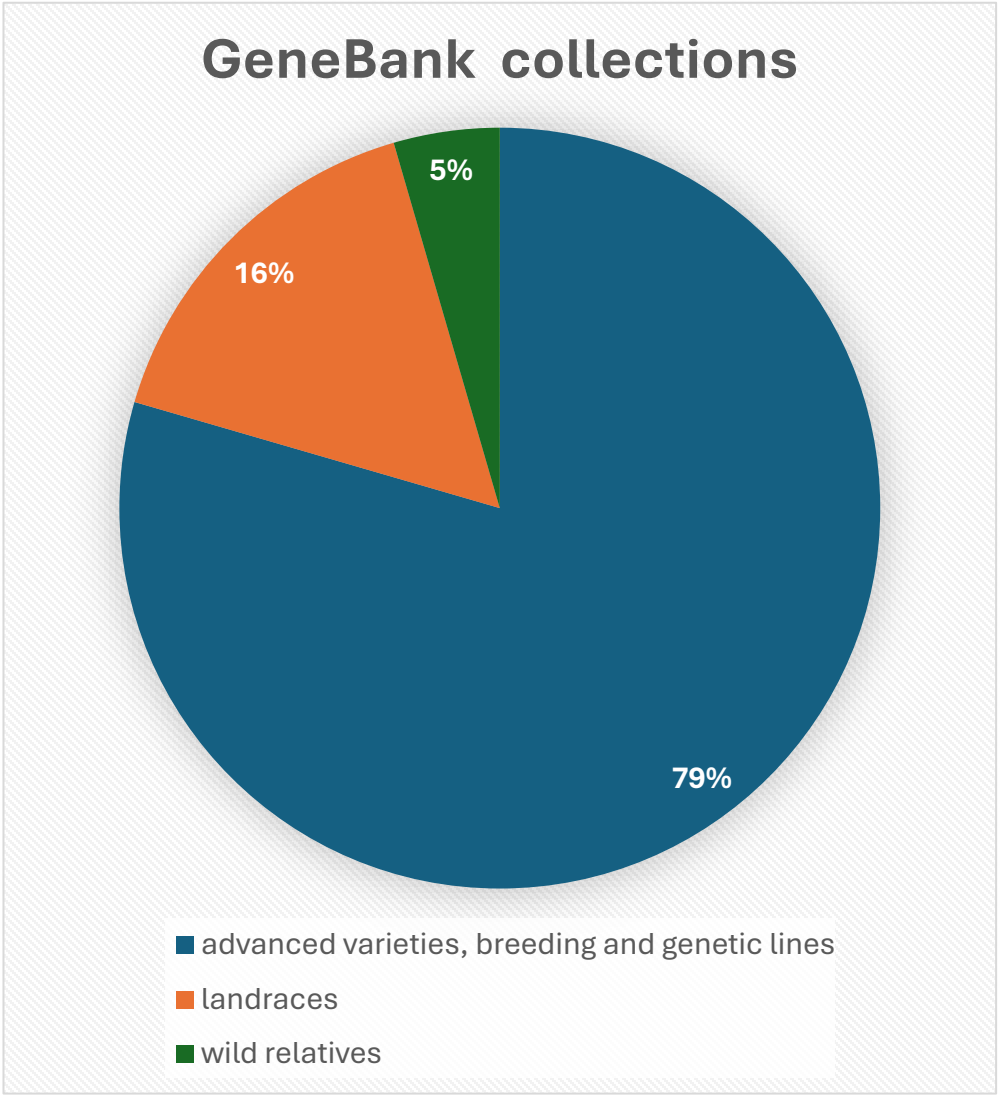
- Preservation of plant gene pool samples in seed vaults and field collections
- Maintenance and management of accession databases
- Introduction of plant genepool accessions to enrich the collections with sources of valuable traits
- Providing users with crop gene pool accessions and collections and with a related information
- Studying gene pool samples to unlock the potential of valuable traits and properties
- Participation in international cooperation programes related to PGR

# Genebank of Ukraine

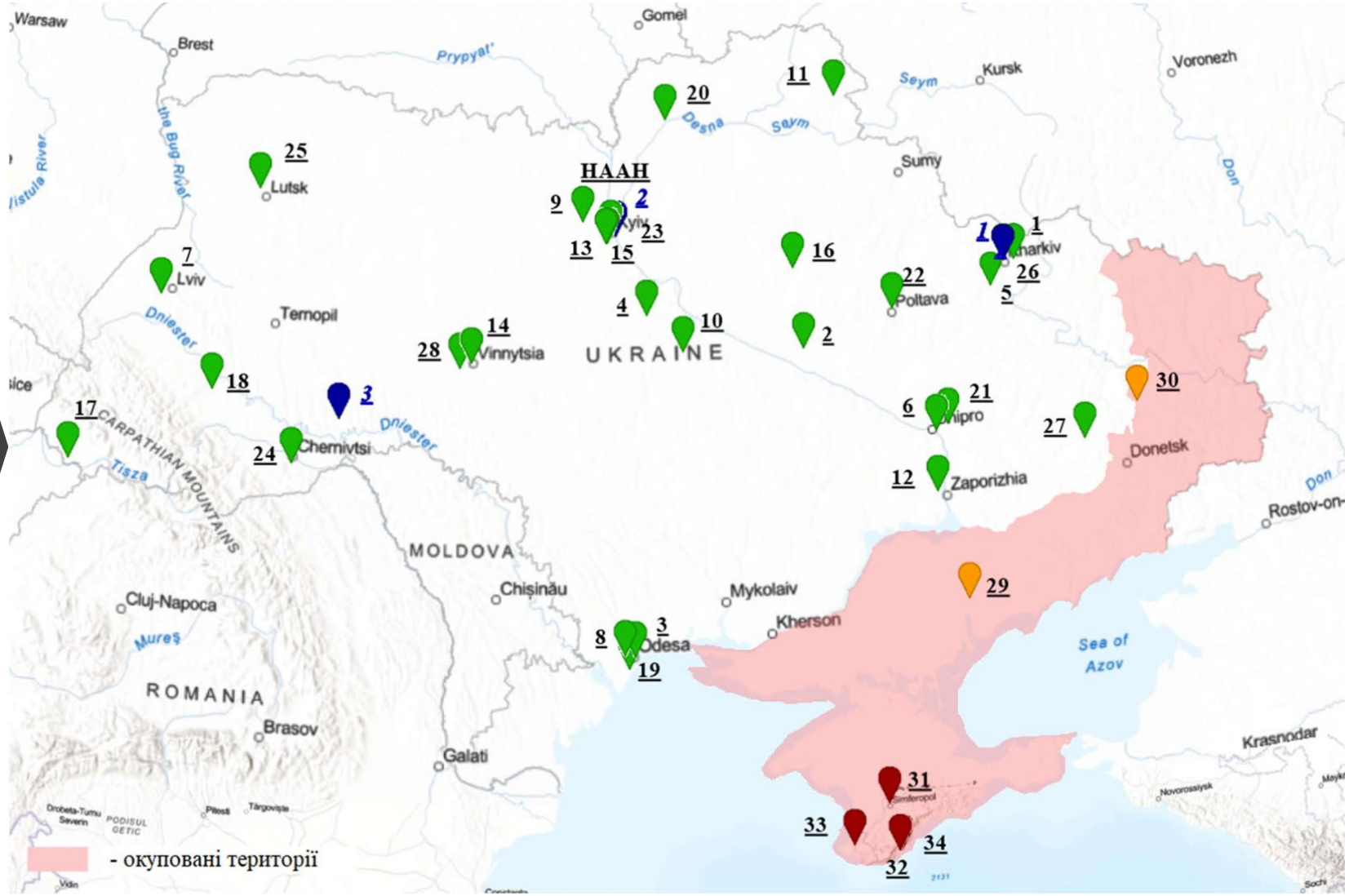
The GeneBank of Ukraine is among the top ten genebanks in the world in terms of the volume and variety of accessions stored in it. To date, institutions within Ukraine's Plant Genetic Resources System have established collections totaling 157,200 accessions, representing 544 crops and 2,020 plant species.

A significant part of the accessions were collected during more than 40 collecting missions, many of which were conducted together with scientists from partner countries — Poland, Slovakia, Moldova, the USA, Canada and the Republic of Korea. *Ex situ* collections of wheat, barley, peas, chickpeas, sunflower, forage/fodder crops collected and stored in the GeneBank of Ukraine are of world importance.

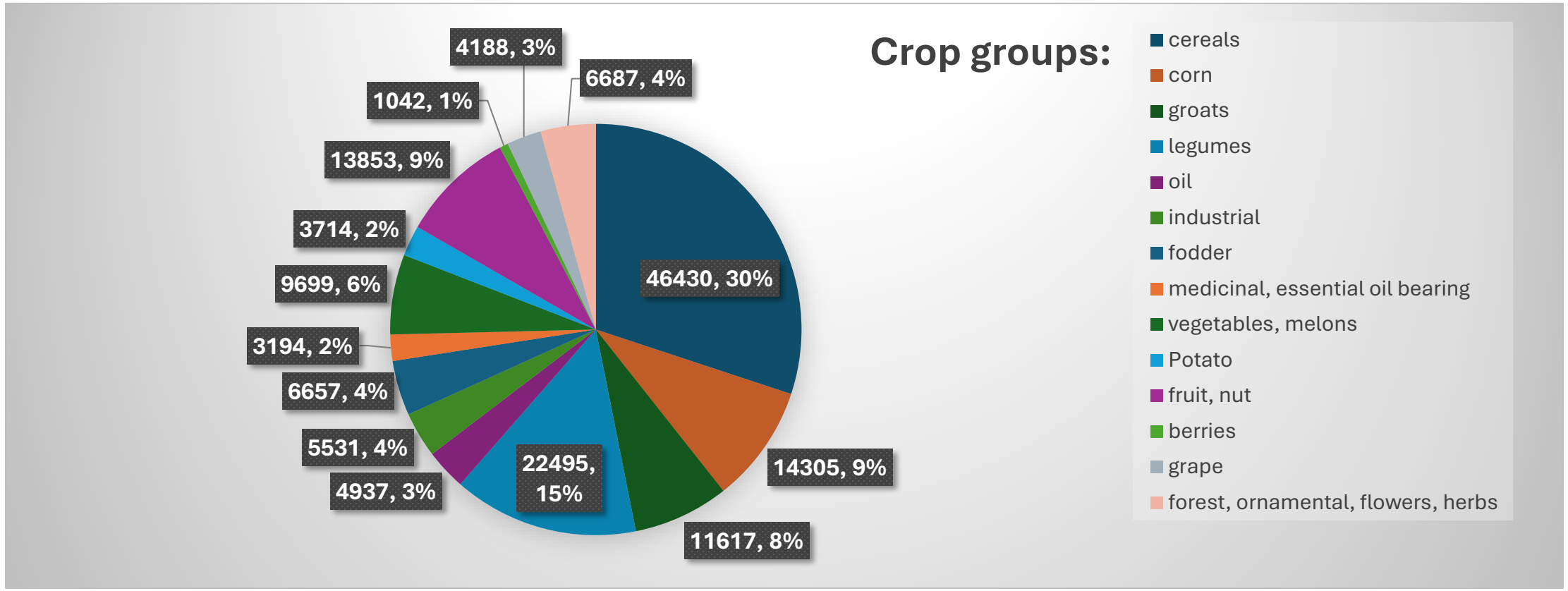
35,600 accessions of Ukrainian origin are stored in the genebank of Ukraine, about 13,000 accessions of Ukrainian origin are stored in national and international genebanks in 30 world countries. In particular, 2,780 accessions are stored in the Svalbard Global Seed Vault. This indicates that accessions of Ukrainian origin are largely unique and insufficiently duplicated.



Map of the location of research institutes of the National Academy of Agrarian Sciences of Ukraine and partner institutions that manage the PGRU collections



# Statistical information about the PGRU collection



# The most significant collections of the National Plant Gene Bank of Ukraine (sample  number)

- Cereals (wheat, triticale, barley, rye) – 47,269
- Corn – 14,804
- Legumes (peas, lentils, chickpeas, beans) – 22,828
- Grains – 11,702
- Vegetables and melons – 9,699
- Fodder crops – 7,448

# Identification and registration of sources of valuable agricultural traits in Ukraine

Each year, around 16,000 gene pool samples are evaluated for agronomic and biological traits, and 1,200–1,400 sources and donors of these traits are identified, along with reference samples for the expression levels of traits in various agricultural crops.

The gene pool samples are identified based on morphological and molecular traits. An annual assessment of the adaptability and quality of the crop accessions is also carried out.

# Provision of crop genetic resource samples to users

The National Center for Plant Genetic Resources, in coordination with other institutions of the Plant Genetic Resources System, during the 2021-2025, provided 18,200 sample packages from the National Gene Bank, of which 17,400 sample packages were transferred to research institutions and educational institutions in Ukraine, and 843 samples were exchanged with foreign gene banks. For use in breeding programs, 6,344 sample packages were transferred; for scientific purposes – 6,772 sample packages; and for educational purposes, 4,774 sample packages were transferred.

# Yuriev Plant Production Institute of NAAS

## LONG-TERM STORAGE OF GENE POOL SAMPLE SEEDS IN FREEZERS AT A TEMPERATURE OF -18 / -20°C, pcs.

- Seeds stored: 52691 accessions

| Crop groups | -18 / -20 °C |
|---|---|
| Cereals | 14913 |
| Maize | 8961 |
| Groats | 4621 |
| Legumes | 8117 |
| Oil seeds | 2942 |
| Industrial crops | 3803 |
| Medicinal and essential oil bearing | 1025 |
| Vegetables and melons | 3837 |
| Fodder crops | 3370 |
| Potatoes | 26 |
| Ornamental flowering and herbaceous plants, fruit trees, forest trees and ornamental trees | 157 |

**MEDIUM-TERM STORAGE OF SEEDS AT A TEMPERATURE OF +4°C**

Seeds stored: 14906 accessions

**Under unregulated temperature conditions in hermetically sealed containers**

Seeds stored: 5798 accessions

# Safety duplication of accessions

| Crop (common name) | Institute | Location, Country | Status (black box/active safety duplicates) | Number of accessions |
|---|---|---|---|---|
| **615 crops** | Active collections in 19 institutions of the PGR System of Ukraine | 15 regions of UKRAINE | active safety duplicates | 85.3 thousand |
| **Wheat** | Svalbard GlobalSeedVault | Norway | black box | 1350 |
| **Bean** | Svalbard Global Seed Vault | Norway | black box | 790 |
| **Grasspea** | Svalbard Global Seed Vault | Norway | black box | 300 |
| **Chickpea** | Svalbard Global Seed Vault | Norway | black box | 280 |
| **Lentils** | Svalbard Global Seed Vault | Norway | black box | 60 |
| **Total** | | | | 170.4 thousand<br>Note ! 70.1 thousand accessions are duplicated in different collections ! |

# Duplicate storage

# Opening of the Ukrainian Doublet Plant Genetic Resources Repository

- The Food and Agriculture Organization of the United Nations in Ukraine, with financial support from the European Union, officially opened the Ukrainian Doublet Repository for Plant Genetic Resources and transferred it to the National Academy of Agrarian Sciences of Ukraine on November 11, 2025. The initiative was implemented in partnership with the International Treaty on Plant Genetic Resources for Food and Agriculture, Crop Trust, and NordGen.
- The opening of the Repository marked the second phase of the international initiative aimed at safeguarding Ukraine’s plant genetic resources.

The modular complex, with a total area of approximately 481.8 $m^2$, includes laboratories, drying facilities, cold and freezer storage chambers, and office premises designed to support full-scale scientific activities and the long-term conservation of Ukraine’s unique seed collections.

The Repository is equipped with modern laboratory infrastructure and energy-efficient technologies, while the installation of a 100 kW solar power station is planned for 2026. The total area of cold and freezer storage facilities is 127.9 $m^2$, ensuring secure preservation of valuable seed collections under controlled conditions.


# Backup storage of seed samples from the National Plant Gene Bank of Ukraine

- In 2023, 51,000 samples were transferred to the Institute of Agriculture of the Carpathian Region of the National Academy of Agrarian Sciences.

- In 2023, 2,000 samples were transferred to the Ustymivka Experimental Plant Breeding Station of the V.Y. Yuryev Plant Production Institute of the National Academy of Agrarian Sciences.

Ustymivka Experimental Plant Production Station of the Yuryev Plant Production Institute of NAAS

**MEDIUM-TERM STORAGE OF SEEDS AT A TEMPERATURE OF +4°C**

The collection contains 31,600 seed samples, which serve as duplicate specimens for the National Collection

Institute of Agriculture of Carpathian Region of NAAS

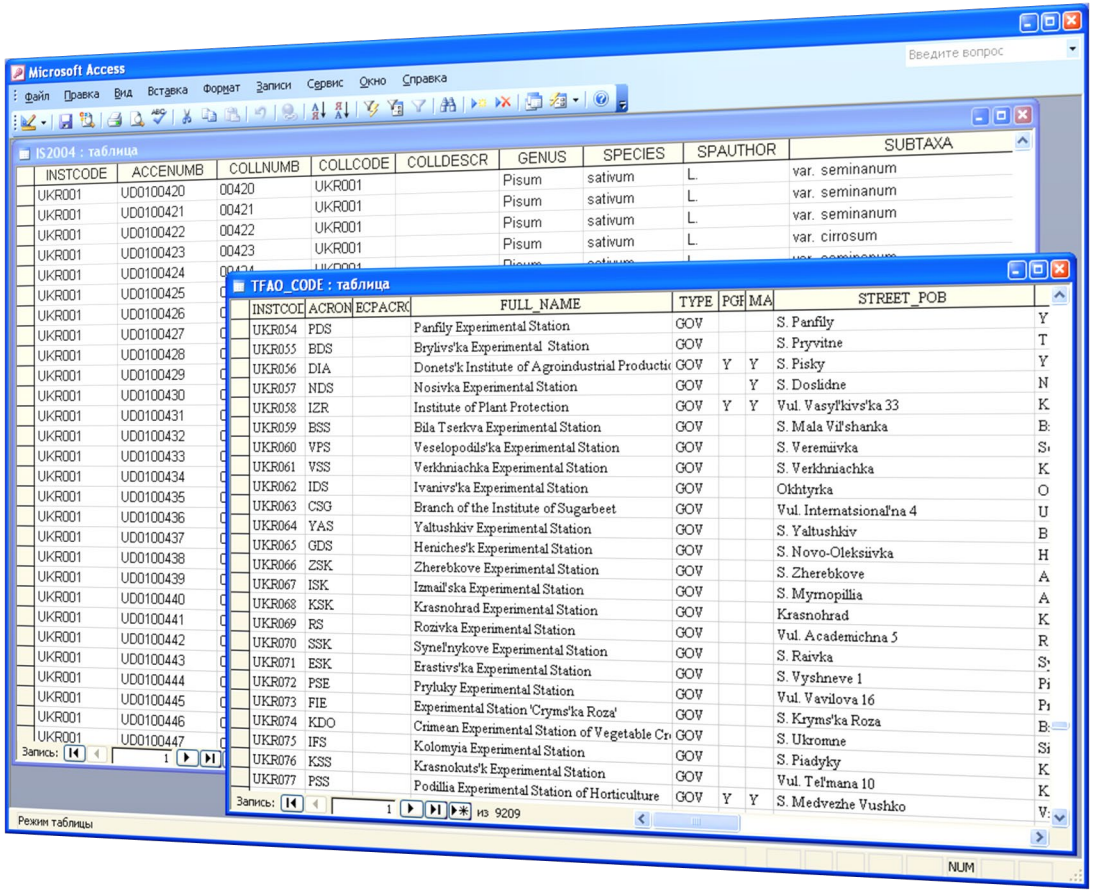
## LONG-TERM STORAGE OF GENE POOL SAMPLE SEEDS IN FREEZERS AT -18–20°C

Seeds from 51,004 samples, which constitute duplicate material from the National Collection, have been transferred


# PLANT GENE POOL INFORMATION SYSTEM

The Plant Gene Pool Information System, created at the National Center for Plant Genetic Resources, ensures effective management of gene pool collections concentrated in the National Genebank and currently provides instant access to 113,9 samples of 347 crops, 623 genera, and 1,255 cultivated and related wild plant species.

The databases of the Information System are included in the European Internet Search Catalogue (EURISCO) of plant genetic resources and GENESYS, which opens up new opportunities for international exchange of gene pool samples and information about them.



With a view to managing the gene pool, the National Plant Gene Bank of Ukraine developed and implemented the Plant Gene Pool Information System in 1992. This system runs on Microsoft Office Access — a relational database that is constantly being improved and is generally operational. Currently, with the assistance of the Nordic Foundation, Norgen and ECPGA, a transition to the GRIN Global database is underway. Our information system uses universal descriptors that comply with international standards for the management of genetic resources based on FAO/IPGRI descriptors.

| | |
|---|---|
| **0**<br>**(NICODE)**<br>**3 characters** | **Code of the country maintaining the national catalogue**<br><br>**Code identifying the national catalogue; code of the country that prepared the national catalogue. Exceptions are possible with the approval of EURISCO.**<br><br>**Example: UKR (National Inventory code)** |
| **1**<br>**(INSTCODE)**<br>6 **characters** | **Institution code**<br><br>The FAO code for the institution where the accession is maintained/stored**.**<br><br>**Example: UKR001 (Institute code)** |
| **2**<br>**(ACCENUMB)**<br>9 **characters** | **National catalogue number of the sample**<br><br>This number is a unique identifier of the accession in the genebank collection and is provided when entering a accession into the national collection (to be filled in at NGRRU).<br><br>**Example: UB0100254 (Accession number)** |
| **3**<br>**(COLLNUMB)**<br>6 **characters** | **Institutional registration number**<br><br>The primary number assigned to a accession by the collection curator, consisting of a numerical value.<br><br>**Example: 00001 (Collecting number)** |
| **4**<br>**(COLLCODE)**<br>6 **characters** | **Code of the institution that collected the sample**<br><br>The code of the institution (FAO Code) that collected the accession. If the accession was collected by the institution that holds it, the code of the collecting institution (COLLCODE) must be the same as the code of the institution where it is held (INSTCODE).<br><br>**Example: UKR001 (Collecting institute code)** |

# Strategy of the National Plant Gene Resources System of Ukraine up to 2030

1. Medium- and long-term storage of  plant gene pool samples seeds, establishment and renewal of field collections, and maintenance of active collections.
2. Duplicate storage of samples: Ustymivka Plant Production Research Station of the V.Y. Yuryev Plant Production Institute, Institute of Agriculture of the Carpathian Region, Svalbard Global Seed Vault.
3. Cryopreservation for long-term storage of the samples of vegetatively propagated crops.
4. Introduction of valuable gene pool samples of cultivated plants and their wild relatives.
5. Expeditionary surveys of regions in Ukraine and collection of plant gene pool samples.
6. Inventory of samples in the collections of institutions within the Ukrainian Plant Genetic Resources System and partners, DNA labelling.
7. Upgrading the ‘Plant Gene Pool’ information system using modern information technologies.
8. Creation and registration of basic, trait-specific, genetic and other collections.
9. Identifying sources and donors of valuable traits, reference accessions.
10. Providing various users with plant gene pool samples: state and private breeding programmes, research programmes, the educational process, etc.
11. Development of the ‘Plant Gene Pool’ information system.
12. International cooperation on plant genetic resources: the FAO Commission; compliance with the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), European cooperation programme on plant genetic resources (ECPGR); national gene banks of foreign countries, etc.

# ACTIVE INTEGRATION IN TO EUROPEAN AND GLOBAL COOPERATION

Membership in European Cooperative Programme on Plant Genetic Resources and participation of representatives of PGRSU institutions in 6 working groups - payment of an annual fee of Euro 4.5 thousand.

Ratification of Ukraine's joining to the International Treaty on PGRFA - 2026.

Cooperation with the National Plant Genebanks of other countries: Poland, Czech, Republic, Bulgaria, Sweden, Estonia, Lithuania, Germany, Italy, Spain, USA, Canada, China and other countries - exchange of methodology and genepool samples (2024-2028).

# International support

An initiative to support the restoration of Ukraine's gene bank system was launched with the participation of a group comprising Germany, NordGen, Poland, Romania, Sweden, the ECPGR Secretariat, the United Kingdom, the Crop Trust, the ITPGRFA Secretariat, USAID, and Canada.

In particular, ECPGR sent a contribution of 5,000 euros to the National Center for Plant Genetic Resources in Kharkiv to support the work carried out by the Ukrainian gene bank in the conservation and exchange of important and unique plant genetic resources.

Additionally, as part of the "transitional funding project" jointly implemented by ECPGR and NordGen with sponsorship from the Novo Nordisk Foundation:

- A contribution was made to cover the portion of the four-month salaries of staff in Kharkiv, which not covered by the government (40%): 14,600 euros
- A portion of the four-month salaries of staff at the station in Ustymivka, which not covered by the government (95%): 18,896 euros
- Diesel fuel (1,000 liters) and support for vehicle rentals to transport staff to the fields: 5,000 euros
- 2 Wintersteiger laboratory threshers for Kharkiv € 25,200 euros
- Two diesel generators 4,400 euros

# We are deeply grateful for the prompt and efficient assistance

- L. Maggioni - ECPGR Secretary Bioversity International, Italy
- F. Begemann - Executive and Group Director for Sustainability, International, and Agricultural Affairs at the German Federal Office for Agriculture and Food (BLE), Germany
- L.L. Steffensen – Head of Department, Department of Biosystems and Technology, Swedish University of Agricultural Studies, Sweden
- L. K. Andersen – Executive Director, NordGen, Sweden
- The Novo Nordisk Foundation, Denmark
- The Crop Trust, Germany
- W. Podima – Senior Researcher, National Center for Genetic Resources, Poland
- P. Vautier, S. Muminiova – Head of the FAO Representative Office in Ukraine
- T. Zaugolnikova – National Coordinator of the FAO Project in Ukraine
- T. Bryvko – Project Coordinator of the FAO Project in Ukraine

# Thank you for your attention