Agricultural Institute of Slovenia

Plant Genetic Resources in Slovenia

EURISCO Training workshop 2018
9 – 11 October 2018, Gatersleben, Germany

Jelka ŠUŠTAR VOZLIČ* , Joži J. CVELBAR**
*Agricultural Institute of Slovenia
**Ministry of Agriculture, Forestry and Food of RS

REPUBLIC OF SLOVENIA
MINISTRY OF AGRICULTURE, FORESTRY AND FOOD

Slovene Plant Gene Bank

- Early projects to collect Slovenian autochthonous populations, ecotypes and landraces of agricultural species were initiated about 60 years ago.
- In 1996 the Ministry of Agriculture, Forestry and Food started financing the Slovene Plant Genetic Resources Programme with the goal to maintain, evaluate, regenerate and preserve Slovenian autochthonous species, ecotypes, populations and landraces of agricultural, medicinal and aromatic plants. Slovene Plant Gene Bank (SPGB) – Gene Bank of Agricultural Crop Species was established. The programme was active until the end of 2017.
- Since 2018 the programme on Plant Genetic Resources in Slovenia operates and is financed through Public Service on Plant Genetic Resources.



Law on Agriculture - Public Services 2018

Article 122 (public service areas and support tasks):

(1) Public services in the field of agriculture under this Act shall be:

1. Agricultural extension service;
2. Public services for professional tasks in the production of agricultural plants (areas of agricultural production): selection and breeding of new varieties; introduction (field testing of value of varieties for cultivation & use);
3. Public service for professional tasks in livestock production;
4. **Public service for conservation and sustainable use of genetic resources for food and agriculture (Gene Bank's tasks);**
5. Public service for irrigation systems;
6. Extension Service in beekeeping.

(2) Public services in the field of agriculture may also include the following support tasks: technical coordination, administrative-technical tasks and training of employees performing public service, as well as other technical and organizational tasks necessary for the execution of these public services.

Decree on the Plant Gene Bank Public Service

The Decree (published in 2017) regulates the implementation of the public service for the conservation and sustainable use of plant genetic resources for food and agriculture, and in particular it specifies:

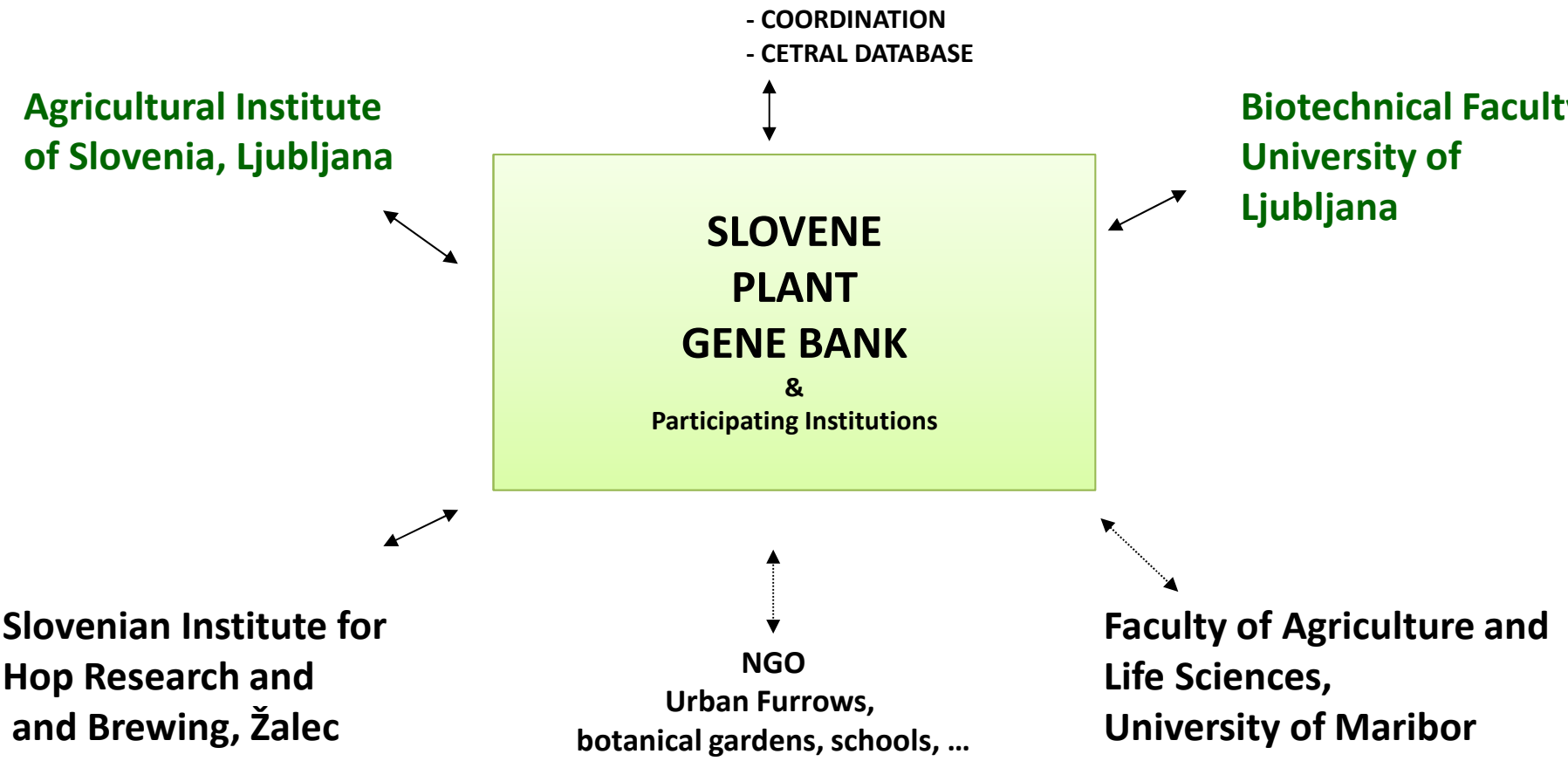
- Participating institutions;
- Coordination (central coordination, central IT, working group(s)...);
- Public service tasks (*Ex situ*, *In situ,* On farm, PGR monitoring, C&E ... Related to GPA & Treaty);
- The methods of performing tasks;
- The conditions & obligations to be fulfilled by the public service;
- Multiannual program for PGR 2018 – 2024 and annual programs;
- Funding (MAFF budget, RDP & research funds…);
- Knowledge transfer - annual workshops on PGRs etc. (2017: ECPGR concept of conservation of RGV On farm);
- Reporting and supervision of the performance of the public service.

Decree on the Plant Gene Bank Public Service

The Decree also defines the meaning of the terms:

- Biodiversity;
- Plant genetic resources;
- Indigenous (autochthonous) genetic material;
- Local crop populations (Landraces);
- Abandoned local varieties, Local varieties;
- Accession;
- *In situ* conservation of PGRFA;
- *Ex situ* preservation of PGRFA;
- Curator;
- Basic information about the accession;
- Characterization of PGRFA;
- Evaluation of PGRFA;
- Genetic erosion.

MINISTRY OF AGRICULTURE
&
AGRICULTURAL INSTITUTE OF SLOVENIA



Slovene Plant Gene Bank

AIS: 3209 accessions

- Vegetables: 1466
- Forage crops: 1033
- Potato: 33
- Cereals: 108
- Small fruit: 169
- Grape vine: 90
- Fruit trees: 310

BF: 1641 accessions

- Cereals: 471
- Maize: 615
- Forage crops: 228
- Fruit trees: 177
- Medicinal and aromatic plants: 150

IHPS: 322 accessions

- Hops: 203
- Medicinal and aromatic plants: 119

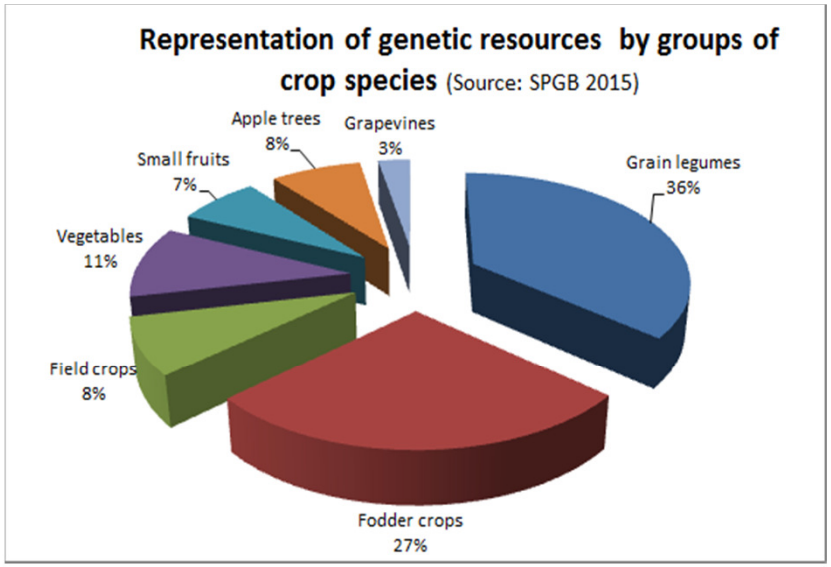
FKBV : 565 accessions

- Fruit trees: 275
- Grape vine: 290

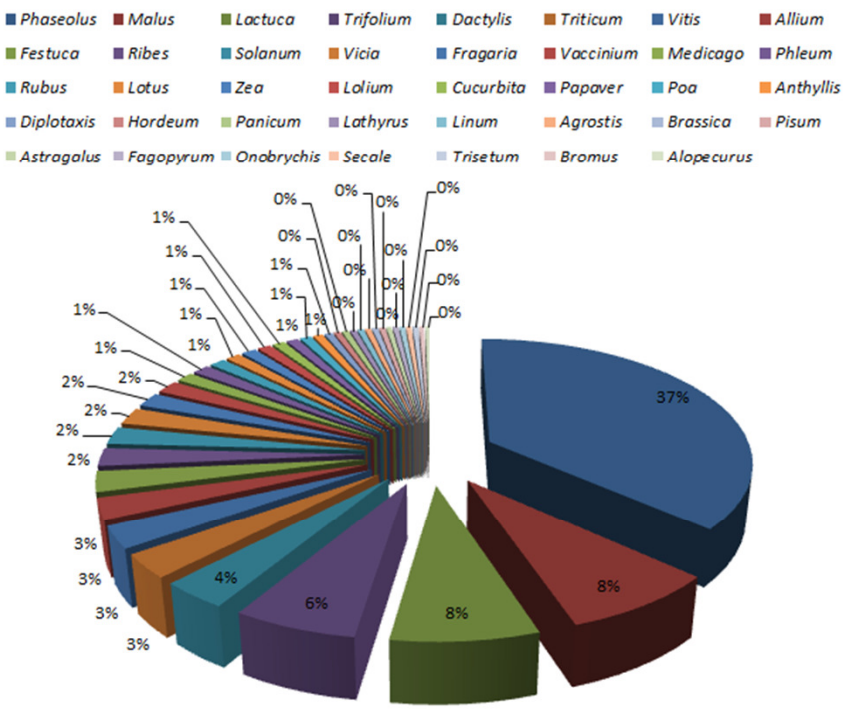
Total number of accessions in the **SPGB: 5737**, represented by more than **240 species**.

KIS: 3209
BF: 1641
FKBV: 565
IHPS: 322
Total: 5737

Slovene Plant Gene Bank – representation by species (AIS)



Representation of genetic resources per species



Slovene Plant Gene Bank

- Collecting
- Documentation and Regeneration
- Characterization and evaluation
- Conservation (storage at + 4°C, -20 °C)
- Exchange, research, breeding

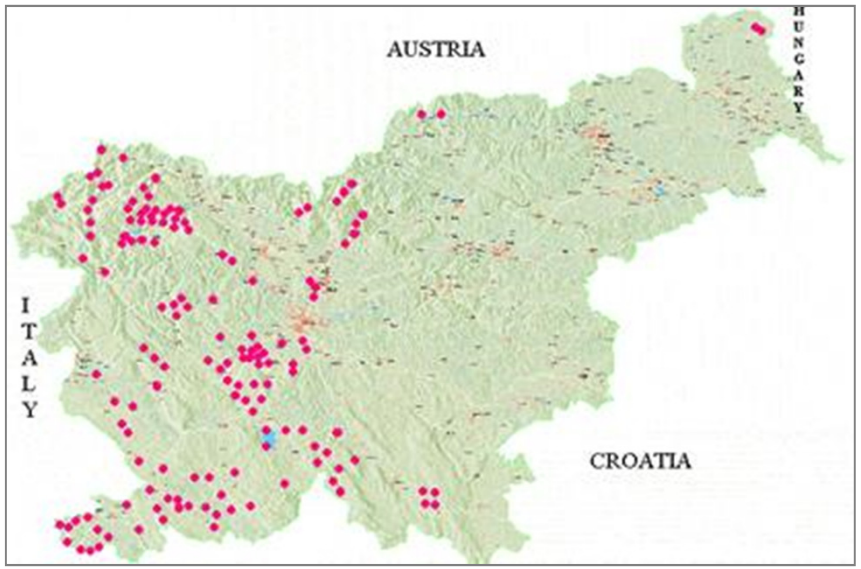
Agricultural Institute of Slovenia

Collecting

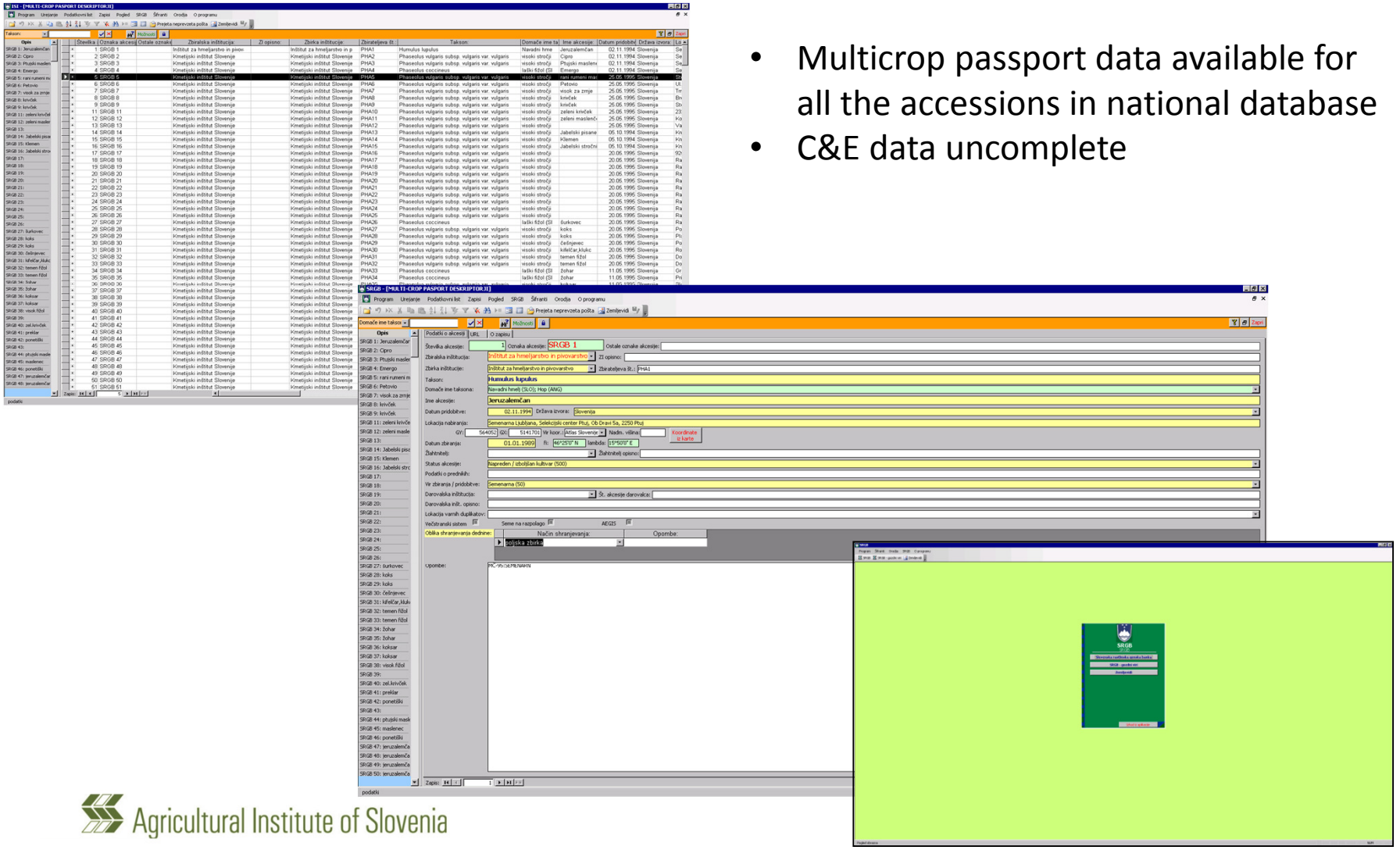
-Wild relatives of cultivated crops,
- Landraces and populations,
- Old cultivars…

Collecting

- Expeditions throghout Slovenia,
- Bilateral and multilateral projects,
- Donations and exchanges,
- Schools, adds, ….



Documentation – National database



- Multicrop passport data available for all the accessions in national database
- C&E data uncomplete

Regeneration

Dependant on crop species:
-Field,
-Screen houses,
-Greenhouses,
-*In vitro*

Characterization

MINIMALNI DESKRIPTORJI ZA FIŽOL

(*Phaselieu*: http://phaselieu.cesga.es/handbook_germplasm.html)

Datum setve:

Rastlina:

1 **Število dni do cvetenja:**
število dni od vznika do takrat, ko se na 50 % rastlin pojavijo prvi cvetovi.

2 **Trajanje cvetenja:**
Število dni od takrat, ko ima 50 % rastlin prve cvetove do takrat, ko je 50 % rastlin prenehalo cveteti.

3 **Tip rasti:**
1 - determinantni grm,
2 - indeterminantni grm s pokončnimi vejami,
3 - indeterminantni grm s številnimi horizontalnimi vejami,
4 - indeterminantni plezalec.

Cvet:

4 **Barva jadra:**
Barvo je potrebno določiti na sveže odprtem cvetu; barve sveže odprtih cvetov so zelo spremenljive po odprtju.
1 - bela,
2 - zelenkasta,
3 - lila,
4 – bela z lila robovi,
5 – bela z lila progami,
6 - temno lila škrlatnim zunanjim robom,
7 - temno lila škrlatnimi pikami,
8 – karmin rdeča,
9 – škrlatna,
10 – druga.

5 **Barva kril:**
Barvo je potrebno določiti na sveže odprtem cvetu; barve sveže odprtih cvetov so zelo spremenljive po odprtju.
1 - bela,
2 - zelenkasta,
3 - lila,
4 – bela s karmin progami,
5 – zelo ožiljena rdeča do temno lila,
6 – bledo rdeča do temno lila,
7 – lila s temno lila žilami,
8 – škrlatna,
9 – druga.

6 **Žile na jadru:**
+ - prisotne, 0 - odsotne

List:

7 **Oblika lista:**
Terminalni list tretjega trokrpega lista.
1 - trikoten,

2 - kvadradast,
3 - okrogel,
4 - jajčast,
5 - jajčast / suličast,
6 - suličast (lanceolate),

7 - suličast (hastate).

8 **Barva lista - klorofil (intenzivnost zelene**
3 - svetlo zelena
5 - srednje zelena
7 - temno zelena

9 **Barva lista – antocijan (prisotnost antoci**
0 - prisoten
9 – odsoten

Strok:

10 Položaj na rastlini:
1 - Pri osnovi
2 - Na sredini
3 – na vrhu
4 – Kombinacija 1, 2, 3 (po celi rastlini)
5 - Drugo

11 Vlaknatost:
1 - Odsotna
5 – Močno prisotna

13 Barva svežega stroka
1 – zelena
2 – rumena
3 – zelena s škrlatnimi progami

14 Barva zrelega stroka

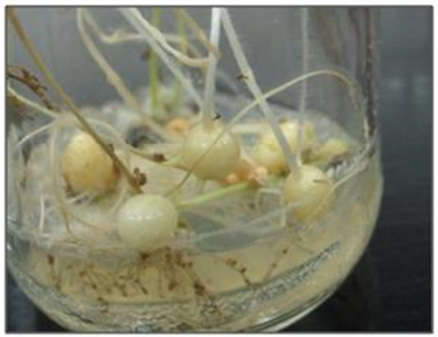
Barva	Okrajšava	Slika
Bela	WH	
Belo rumena ali rjavkasta	WY	
Rumeno rjavkasta	YB	
Zelena	GR	
Vijolična	VI	
Roza lisasta	PM	
Rdeče lisasta	RM	
Rdeče črtasta	RS	
Vijolično lisasta	VM	
Lila lisasta	LM	
Vijolično črtasta	VS	

Storage

Working collection (mid-term storage):
- 500 - 1000 seeds/accession stored at + 4 °C.

Basic collection (long-term storage at –20°C):
-located at the Agricultural Institute of Slovenia.

Accessions are also kept in ***'in vitro'*** conditions and ***'in vivo'*** in permanent plantations for hops, fruit, grapevine and some species of medicinal and aromatic plants.

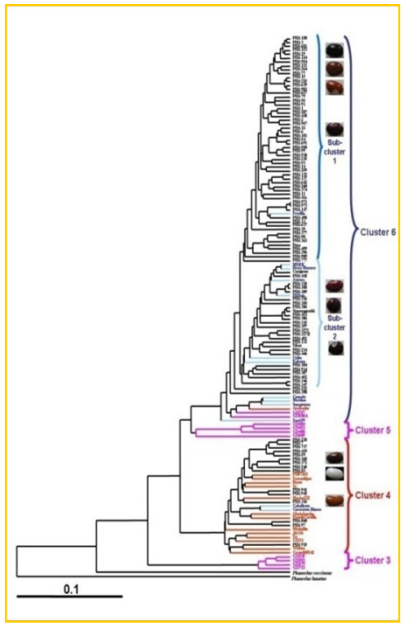




Use of plant genetic resources

-Research:
- Diversity studies, Genetic erosion,
- Population genetics, Mapping,
- Biotic/abiotic stress resistance/tolerance
- Conservation and preservation studies….

-Breeding,

-Immediate use on farm…



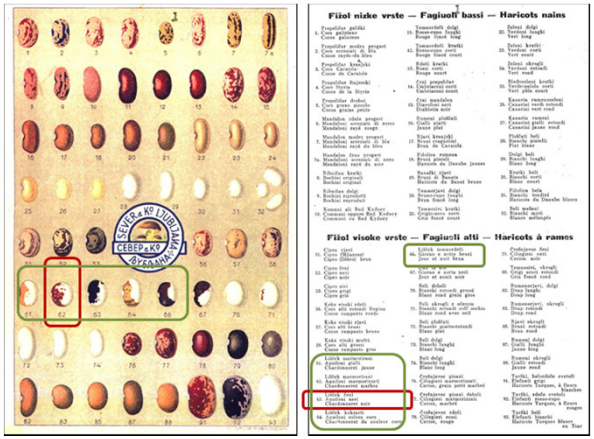
Re-introduction of traditional Slovenian common bean landraces

- 16 Češnjevec accessions and 23 accessions of landrace Lišček were selected from the gene bank at Agricultural Institute of Slovenia.
- Field studies were conducted in three successive years; plant growth, resistance to diseases and pests were evaluated and the yield was determined. The chemical composition of raw seeds and sensory analysis was performed.

➢ **Two new varieties inscribed in the List of varieties as conservation varieties:**

Češnjevec pisani visoki

Lišček rdeči marmorirani



Reintroduction of ‘Ljubljanska ledenka’

Ljubljanska ledenka is an old Slovene autochthonous variety that originates from Ljubljana and its surroundings. In 19th century it was spread to Austria and to Czech Republic. It is considered as un ‘umbrella variety’ and some of the varieties derived from it are included in the Common Catalogue of Varieties (CCV) of the EU under synonyms ‘Laibacher Eis’ 2, 3 and 4, with characteristic red leaf edge.

Based on the results of analyses of >150 lettuce accessions from the Slovene Plant Gene Bank and other gene banks around the world it was possible to select some accessions of the variety Ljubljanska ledenka which differed from all other varieties. Furthermore, one variety was inscribed in the National list of Varieties as well as in the Common Catalogue of Varieties of Vegetable Species of the EU under the name Ljubljanska ledenka.

http://www.geneticresources.eu/compendium/pdfs/SI_PGR_LedenkaSalad.pdf


Thank you for your attention!
Foto: J. Verbič