



# GENETIC RESOURCES OF GRAIN LEGUMES IN THE SLOVAK REPUBLIC

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*ForEVA – Fostering the need of implementation of the  
ECPGR's European Evaluation Network (EVA) on  
Grain legumes*

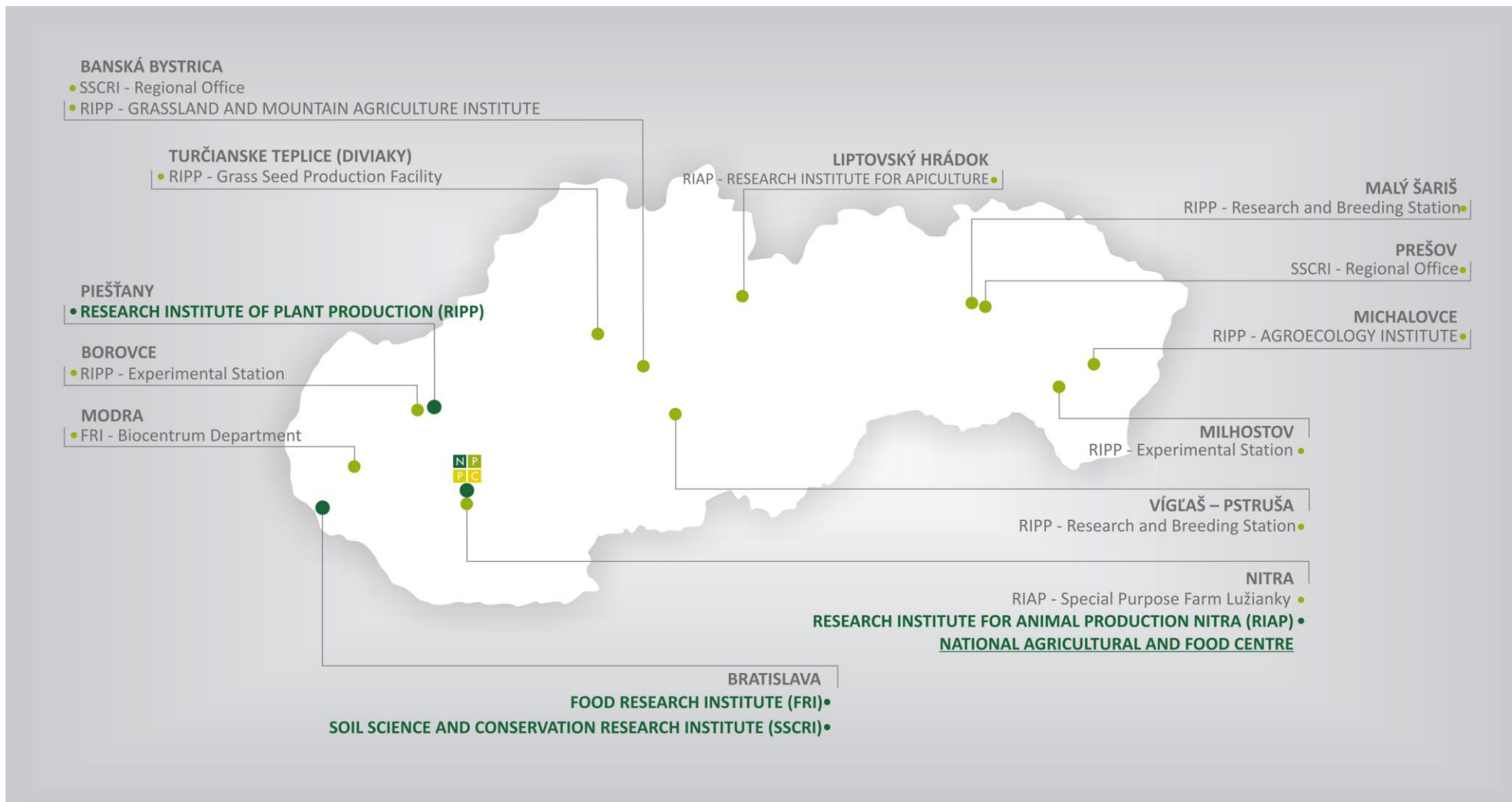
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NATIONAL AGRICULTURAL  
AND FOOD CENTRE

RESEARCH INSTITUTE OF  
PLANT PRODUCTION



ECP/GR

# RESEARCH INSTITUTE OF PLANT PRODUCTION



## DEPARTMENTS:

- ✓ Department of cultivation systems -research of factors conditioning and influencing the quantity and quality of yield at main field crops
- ✓ Department of applied biology and genetics - analyses of plant genotypes and phenotypes and their pathogens, relationship between them and creation of new biological materials with improved properties using the progressive methods, biotechnologies and breeding
- ✓ GENE BANK - Special-purpose technical equipment used for long-term storage of seeds of plant genetic resources under regulated conditions.
- ✓ research breeding stations and workplaces – Borovce, Víglaš, Malý Šariš
- ✓ Grassland and mountain agriculture research institute
- ✓ Agroecology research institute



# GENE BANK OF SLOVAK REPUBLIC



**Registered seat:** NPPC VÚRV Piešťany, Bratislavská 122

**Mandate** by Ministry of Agriculture was given to our RIPP, Piešťany in 1991

**Funded and supported** - Ministry of Agriculture

Long - term storage of PGR - 181 collections  
September 2023 – 28 267 accessions

- ✓ **Ex situ:** Active collection           21 113 PGR  
                  Basic collection            5 528 PGR  
                  Save duplications       4 001 PGR in Czech Republic  
                                                  1 080 PGR in Svalbard
- ✓ **In vitro:** 599 potatoes genotypes  
                  75 clones, 11 varieties of hops
- ✓ **On farm:** Currently under development



# MOST IMPORTANT PROJECTS ON LEGUMES



cooperation on projects:

- ✓ Task of professional assistance for the Ministry of agriculture and rural development of the SR: Management of plant genetic resources and operation of the Gene Bank of the Slovak Republic -monitoring, regeneration and preservation of PGR - annually
- ✓ the Operational Programme Integrated Infrastructure within the project: Sustainable smart farming systems taking into account the future challenges 313011W112, cofinanced by the European Regional Development Fund – SMARTFARM
- ✓ Exploring of grain Legumes diversity for sustainable European Agri-food System – Explo-Div
- ✓ cooperation with Agritec Plant Research s.r.o., Šumperk (ZCE) in the field of reproduction, regeneration and research of legumes (peas, lentils, beans)
- ✓ cooperation with small farmers – Legumen v.o.s and others



# THE GRAIN LEGUMES COLLECTION IN GENE BANK



- ✓ Slovak collection of grain legumes is currently only in the Research Institute in Piešťany.
- ✓ The collection of grain legume in the Slovak Republic consists of domestic and foreign materials.

Table 1. Grain legumes accessions held by the Genebank of Slovakia (September 2023)

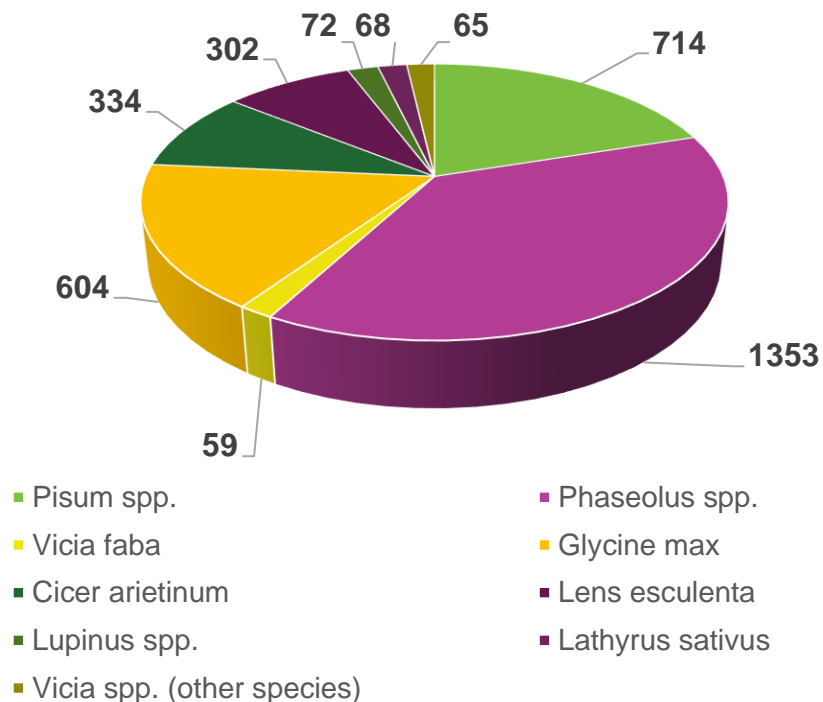
species	No. of accessions	% of total
<i>Lathyrus sativus</i>	63	1,9
<i>Cicer arietinum</i>	324	6,7
<i>Lupinus spp.</i>	71	2,1
<i>Phaseolus vulgaris</i>	1282	38,2
<i>Lens esculenta</i>	284	8,5
<i>Glycine max</i>	551	1,6
<i>Pisum spp.</i>	654	19,5
<i>Vicia faba</i>	59	17,6
<i>Vicia spp. (other species)</i>	65	1,9
<b>Total</b>	<b>3353</b>	<b>100</b>



# THE GRAIN LEGUMES COLLECTION IN GENE BANK

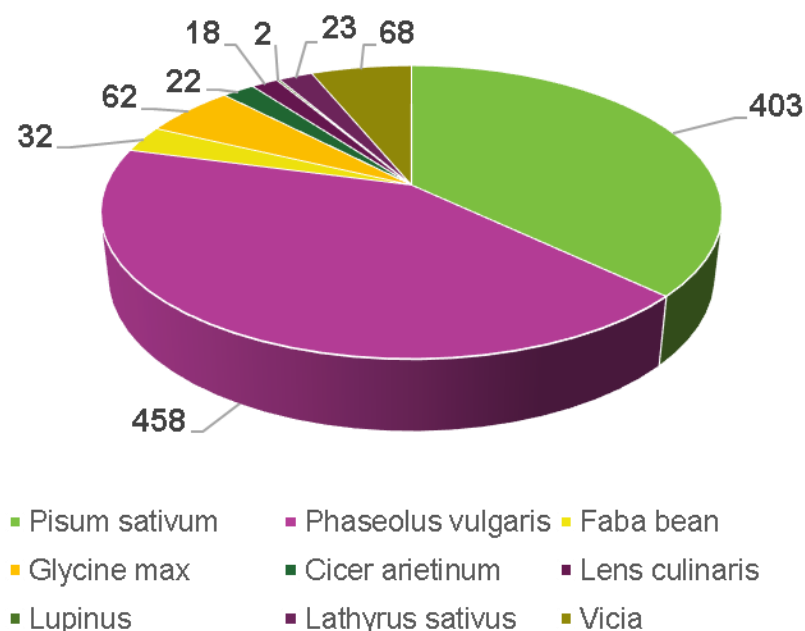
Graph 2. Active collection in Gene bank of Slovak Republic in 2023

**3 571 accessions**



Graph 2. Basic collection in Gene bank of Slovak Republic in 2023

**1 088 accessions**



# MAIN ACTIVITIES - Collection

- ✓Collecting expeditions in several regions of Slovakia.
- ✓Currently no in situ conservation of genetic resources of grain legume in our region.
- ✓Preparing On-farm conservation and cooperation with farmers and growers.
- ✓ At present we don't develop any genetic stock for scientific purposes.
- ✓We do not have genotypic and phenotypic data available in the databases.

Table 2. Distribution of Slovak origin accessions according to the biological type of the genetic source

species	Lokal population	Breeding material	Slovak varieties	No. of accessions SVK origin
<i>Lathyrus sativus</i>	40	4	1	45
<i>Cicer arietinum</i>	15	0	3	18
<i>Lupinus spp.</i>	0	0	0	0
<i>Phaseolus vulgaris</i>	582	1	43	626
<i>Lens esculenta</i>	3	1	4	8
<i>Glycine max</i>	0	56	2	58
<i>Pisum spp.</i>	0	166	36	202
<i>Vicia faba</i>	1	0	6	7
<i>Vicia spp. (other species)</i>	3	1	4	8
<b>Total</b>	<b>644</b>	<b>229</b>	<b>99</b>	<b>972</b>





# MAIN ACTIVITIES - Multiplication, evaluation and storage

- ✓ The samples are planted on an area of 2 to 5 m<sup>2</sup>, depending on the crop.
- ✓ Evaluation, characterization and screening for main traits (morphological, ecological and agronomic) are being continuously ongoing.
- ✓ Evaluation period for each sample is two years.
- ✓ All traits are evaluated according to international descriptors lists.
- ✓ During the experiments, all accessions are compared with the standards.



# MAIN ACTIVITIES - conservation

- ✓ The grain legume accessions are stored in a base collection at  $-18^{\circ}\text{C}$  and the active collection at  $0 - 4^{\circ}\text{C}$  after drying to 5-10 % moisture (FAO/IPGRI 1994).
- ✓ Generally, we store 4000 viable seeds in both collections.



# MAIN ACTIVITIES - Dokumentation



- ✓ Information system for GB – GRISS <https://griss.vurv.sk/>
- ✓ Updating, checking and revising datasets of the passport and description data of all collections permanently ongoing.
- ✓ Passport data of most collections can be found at EURISCO, AEGIS project web site.

Table 3. Passport and description data of grain legume collections in 2023

Species	Passport data	Description data
<i>Lathyrus sativus</i>	63	52
<i>Cicer arietinum</i>	324	253
<i>Lupinus spp.</i>	77	55
<i>Phaseolus vulgaris</i>	1 339	1274
<i>Lens esculenta</i>	292	231
<i>Glycine max</i>	642	415
<i>Pisum spp.</i>	785	0
<i>Vicia faba</i>	59	0
<i>Vicia spp. (other species)</i>	65	0
<b>Total</b>	<b>3646</b>	<b>2280</b>



# MAIN ACTIVITIES - Utilisation



✓Users are supplied with a maximum of 200 seeds based on the SMTA protocol and additional information on the requested material.

Table 4. Overview issuance of accessions of grain legume at home and abroad until 2023

species	Slovakia	abroad	total per crop
<i>Pisum spp.</i>	229	88	317
<i>Vicia spp. (other species)</i>	19	17	36
<i>Vicia faba</i>	43	5	48
<i>Phaseolus vulgaris</i>	283	229	512
<i>Glycine max</i>	257	22	279
<i>Lupinus spp.</i>	18	1	19
<i>Lens esculenta</i>	160	35	195
<i>Cicer arietinum</i>	115	33	148
<i>Lathyrus sativus</i>	25	20	45
<b>Total</b>	<b>1149</b>	<b>450</b>	<b>1599</b>

Table 5. Purpose of issuance of grain legume by 2023

species	breeding	education	research	total per crop
<i>Pisum spp.</i>	20	7	319	346
<i>Vicia spp. (other species)</i>	4	1	31	36
<i>Vicia faba</i>	0	2	45	47
<i>Phaseolus vulgaris</i>	12	1	480	493
<i>Glycine max</i>	0	4	269	273
<i>Lupinus spp.</i>	0	1	17	18
<i>Lens esculenta</i>	74	0	119	193
<i>Cicer arietinum</i>	0	0	148	148
<i>Lathyrus sativus</i>	0	0	45	45
<b>Total</b>	<b>110</b>	<b>16</b>	<b>1437</b>	<b>1599</b>



# WHAT WE CAN PROVIDE for EVA



- ✓ Seeds availability for sharing only based on SMTA
- ✓ Germination test - Germinability we are determined of twice 100 seeds (standards by ISTA, AOSTA, Methodology by UKSÚP -Central control and testing institute for agriculture)
- ✓ Material moisture test and drying up to storage humidity 4 - 8%
- ✓ Storage samples in basic collection based on the agreed terms
- ✓ We can currently offer for the project EVA - a selection genotypes of Slovak origin with passport and descriptive data with a minimum amount of seeds sample
- ✓ We currently do not have cooperation with any breeding company or growers for the EVA project.



Thank you for your  
attention

