



# GRAIN LEGUMES COLLECTION IN LATVIA

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[www.arei.lv](http://www.arei.lv)

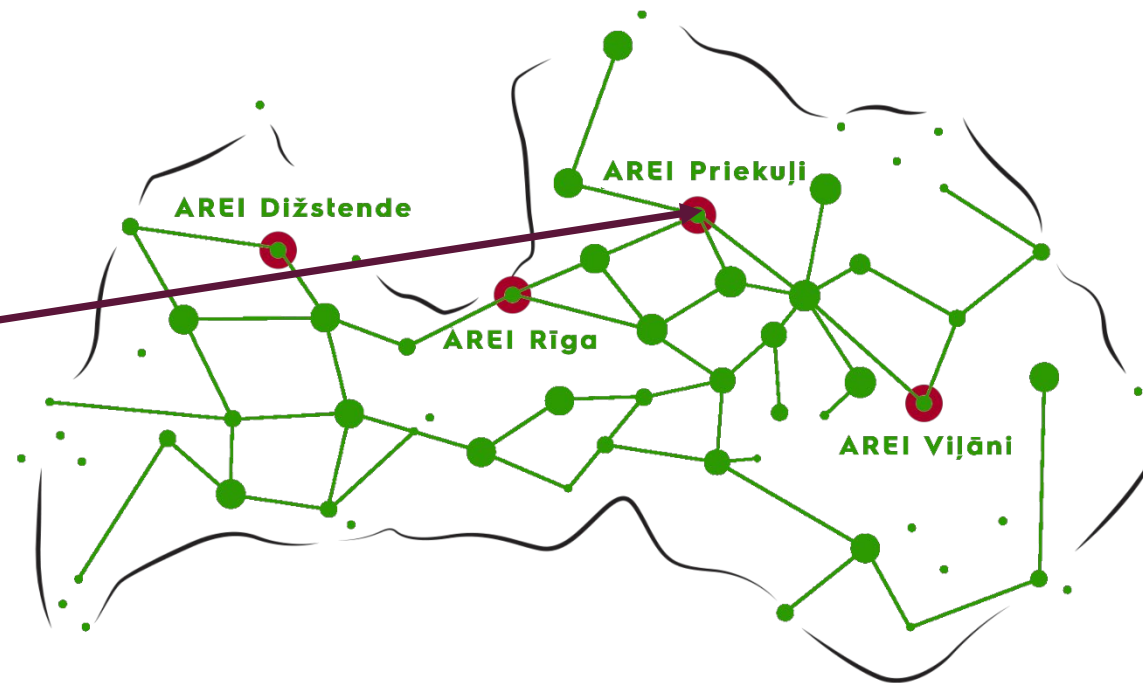
*ForEVA – Fostering the need of implementation of the ECPGR's European Evaluation Network (EVA) on Grain legumes*

*10-11 October 2023, Bucharest, Romania*



# Institute of Agricultural Resources and Economics.

## Priekuli research center



# Priekuli research center

## The main research areas :



- **Crop breeding and genetics, improvement of breeding techniques:**
  - **pea, field beans;**
  - **potatoe;**
  - **spring barley,**
  - **winter rye and triticale**
- **Crop management and ecology for integrated and organic farming**
- **Crop yield quality and efficient utilisation**



# Projects



## Enhancing of legumes growing in Europe through sustainable cropping for protein supply for food and feed

FP7 Research Project N° 61378

- The main activities -
  - Evaluation of pea, faba bean and cowpea/black-eye-bean local genetic resources for the development of new varieties for food and feed and further use in breeding;
  - Phenotypically selected accessions were further tested for site-specific biotic and abiotic stresses (under organic and conventional conditions)





## DELIVERABLE 2.5

### HANDBOOK

Based on results evaluation of *Vicia faba* L.,  
*Pisum sativum* L., and *Vigna unguiculata* L.  
broad gene pool

LEAD BENEFICIARY: AREI  
M48 – DECEMBER 2017

## • Outcome of the project

- Handbook developed on the results obtained from the evaluation of pea, cowpea and faba bean genotypes
  - <https://www.arei.lv/en/article/2018-02-01/handbook-eurolegume>
- New, well-adapted samples for local conditions of peas and beans obtained from amateur gardeners were added to the collection and implemented in the breeding program

- Aim of the project:
  - to improve transparency and competitiveness of the organic seed and breeding sector and encourage greater use of organic seed
- The main activity we participate:
  - *New breeding methods and co-design approaches for optimised annual crop mixtures, with a focus on cereals*
    - *These activities also include the spring pea and faba bean mixture with the support crops ( spring wheat, spring triticale.)*
- The main task was
  - to compare pea and field beans performance in pure stand and in the mixture with support crop under organic conditions.



Improve performance of organic agriculture by boosting organic seed and plant breeding efforts across Europe



- **Outcome**

- Better understanding of the importance of breeding for plant – plant interaction.
- Crop mixture growing possibilities for seed production in organic farming in Latvia.
- The most acceptable combinations of crops for their good agronomic performance and quality were identified and offered for testing to farmers.



# Grain Legume collection

The Genetic Resource Centre (GRC) of Latvia *for* EVA  
[www.gernes.lv](http://www.gernes.lv)

Species	In total	Available
<i>Glycine max</i>	9	9
<i>Pisum sativum</i>	63	51
<i>Phaseolus</i>	1	0
<i>Vicia faba</i>	29	26
<i>Vicia sativa</i>	21	21
<i>Vicia sp.</i>	3	0
<i>Vicia villosa</i>	11	0





# Grain Legume collection

## Working collections at PRC



- **Spring pea:**
  - 59 accessions:
    - Landraces,
      - for animals feed – green mass (very tall plants, small grains, low seed yield)
    - Old varieties
      - for green forage and seeds for human consumption (medium tall – tall)
    - Commercial varieties,
    - Breeding lines
      - for green forage and animal feed and human consumption (short -medium tall – tall, high protein content)
    - Local (from amateur gardeners)
      - for human consumption (large-sized grains, high protein content, good taste characteristics)
- **Field beans:**
  - 7 accessions – local varieties (populations)
    - Medium tall – tall; medium late – late; small sized grains







# Availability of phenotypic data on peas and beans

<https://www.arei.lv/en/article/2018-02-01/handbook-eurolegume>



DELIVERABLE 2.5 – DECEMBER 2017

K-4821		
	Collecting number (EUROLEGUME database)	P27
	Genus, specie, subtaxa	<i>Pisum sativum</i> L.
	Common crop name	Pea
	Accession name	k-4821
	Acquisition date	2014
	Country of origin	Latvia
	Location of collecting site, latitude, altitude	57°18'57"N, 25°20'19"E, 123 m
	Or: Donor institution	AREI, Latvia
	Donor accession number	—
	Biological status	Breeding line
	Flower color	1 - white
	Seed color	1 - green
	Seed marbling	1 - absent
	Growth type	1 - non dwarf

K-4824		
	Collecting number (EUROLEGUME database)	P28
	Genus, specie, subtaxa	<i>Pisum sativum</i> L.
	Common crop name	Pea
	Accession name	k-4824
	Acquisition date	2014
	Country of origin	Latvia
	Location of collecting site, latitude, altitude	57°18'57"N, 25°20'19"E, 123 m
	Or: Donor institution	AREI, Latvia
	Donor accession number	—
	Biological status	Breeding line
	Flower color	2 - pink
	Seed color	2 - brown
	Seed marbling	1 - absent
	Growth type	1 - non dwarf

Traits	Northern conditions <sup>54</sup>			Southern conditions <sup>55</sup>		
	Min	Max	Mean	Min	Max	Mean
Plants length (cm)	74.0	230.5	127.3	-	-	67.7
Days to flowering	52	69	63	-	-	119
Days to full ripening	93	122	105	-	-	180
Length of flowering stage	15	56	26	-	-	43
Resistance to lodging	3	6	5	-	-	3
100 seed weight (g)	15.77	21.91	18.29	-	-	14.45
Average seed weight per plant (g)	0.77	8.41	3.38	-	-	12.00
Protein content (%)	22.3	30.5	26.8	-	-	-
Susceptibility to pod spot	1	5	4	-	-	-
Susceptibility to powdery mildew	1	1	1	-	-	7
Susceptibility to downy mildew	-	-	1	-	-	-
Susceptibility to pulses rust	0	1	1	-	-	-

<sup>54</sup> AREI (2014, 2015, and 2016) and ECRI (2014)

<sup>55</sup> INIAV (2015)

Traits	Northern conditions <sup>56</sup>			Southern conditions <sup>57</sup>		
	Min	Max	Mean	Min	Max	Mean
Plants length (cm)	140.4	169.1	155.3	-	-	90.3
Days to flowering	58	69	65	-	-	123
Days to full ripening	102	122	109	-	-	185
Length of flowering stage	12	57	33	-	-	47
Resistance to lodging	3	7	5	-	-	3
100 seed weight (g)	10.21	21.70	17.05	-	-	10.00
Average seed weight per plant (g)	2.83	7.96	5.39	-	-	0.15
Protein content (%)	21.6	28.7	25.3	-	-	-
Susceptibility to pod spot	1	5	4	-	-	-
Susceptibility to powdery mildew	1	1	1	-	-	7
Susceptibility to downy mildew	-	-	1	-	-	-
Susceptibility to pulses rust	0	1	1	-	-	-

<sup>56</sup> AREI (2014, 2015, and 2016) and ECRI (2014)

<sup>57</sup> INIAV (2015)



# Expectations from EVA legumes

## - Expectations

- To introduce and evaluate new genetic material to find traits that could be valuable for breeding program.
- To new opportunities for cooperation

## - Constraints

- Plot size min 1m<sup>2</sup>