

Landrace conservation and use in Romania - current state



Silvia Străjeru, Gene Bank of Suceava, Romania



Topics addressed:



- *Ex situ* landrace conservation
 - methodology for inventorying
 - institutions involved
- *In situ* – on farm landrace conservation
 - methodology for inventorying
 - case study from Romania
 - Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County



Ex situ landrace conservation - methodology for inventorying



Main steps:

- 
- identify as many as possible stakeholders in the country, using different information sources
 - contact them and request a dataset for landrace material, based on MCPDs
 - coordinate the data verification
 - centralize and standardise all information received
 - identify the duplicates and unique accessions (based on acc. name), and circulate a report to the institutions provided data
 - operate any corrections are needed
- 




Ex situ landrace conservation - methodology for inventorying

Main steps:



- develop a questionnaire to ask meta-data on evaluation and characterization
- design a National Landrace Database to record all the information received
- make the database searchable via internet
- edit a National Landrace Catalogue
- distribute the NLD in electronic and/or printed forms to contributing entities, and to users at request
- update the NLD every year







Ex situ landrace conservation - methodology for inventorying



In Romania these steps have been undertaken, but for whole pgr collections, and the results are:

- 
- National Database of PGRFA was established in 2000
 - National Catalogue on PGRFA was published
 - All information within NDB was downloaded to EURISCO
- 



Ex situ landrace conservation



Major institutions involved:



□ *Gene bank Suceava* – responsible for keeping in long- and medium-term storage conditions the national collection for all seed propagated plants; it coordinates the pgr activities in Romania; **number of landraces - 8819 landrace accessions**

□ *Fruit Growing Research and Development Institute Maracineni* – maintaining and managing the national collection for fruit trees & shrubs, and strawberry; 11 research stations are led by the institute. All species in the collection are kept as “field collection”, excepting *Fragaria sp.* and *Rubus sp.* that are conserved “in vitro”; **1362 landrace accessions**





Ex situ landrace conservation

Major institutions involved:



□ *Agricultural Research and Development Institute Fundulea* – has under coordination 14 research stations, and manages the breeding collection for cereals and industrial crops; **704 landrace accessions**



□ *Grassland Research and Development Institute Brasov* - is the leading institution for 3 research stations, and maintains grasses breeding collection; **377 landrace accessions**



□ *Banat University of Agricultural Sciences and Veterinary Medicine Timisoara* – **668 landrace accessions**



In situ – on farm landrace conservation - methodology for inventorying



Suggested steps:



□ Access and collate landrace information

■ sources of information:

- PGR Databases of public/private domains

■ contacts with:

- seed production/distribution companies
- agricultural extension services
- PGR experts
- NGOs

- internet and scientific literature





In situ – on farm landrace conservation - methodology for inventorying



Suggested steps:



identify the regions and crops of interest for on farm conservation

start making the inventory within the richest area in landraces, and select the group of crops/crop best represented in cultivation, as well as, having the biggest importance in local agriculture

design a specific database to manage landrace information





In situ – on farm landrace conservation - methodology for inventorying



Suggested steps:



□ adopt and adapt if necessary the on–farm descriptors developed within ECPGR *In situ* & On farm Task Forces, based on those provided by Gene bank in Suceava and Perugia University (see http://www.ecpgr.cgiar.org/Networks/Insitu_onfarm/Docs/OnfarmDescr.pdf) [On-farm descriptors.ppt](#)



□ make the database searchable on line



In situ – on farm landrace conservation

Case study from Romania

□ working team:

- Silvia Strajeru
- Manuela Ibanescu
- Dana Constantinovici

□ data contributors: D. Murariu, D. Rusu, D. Sandru, past collecting team members

□ sources of information:

- BIOGEN Database
 - National PGR Database
 - local authorities
 - biology and agronomy teachers
 - internet, scientific literature
- } primary sources
- } second sources



In situ – on farm landrace conservation – case study from Romania



Overview of the distribution of landraces in Romania

Period covered

– 2000 – 2008 years

Number of collection trips

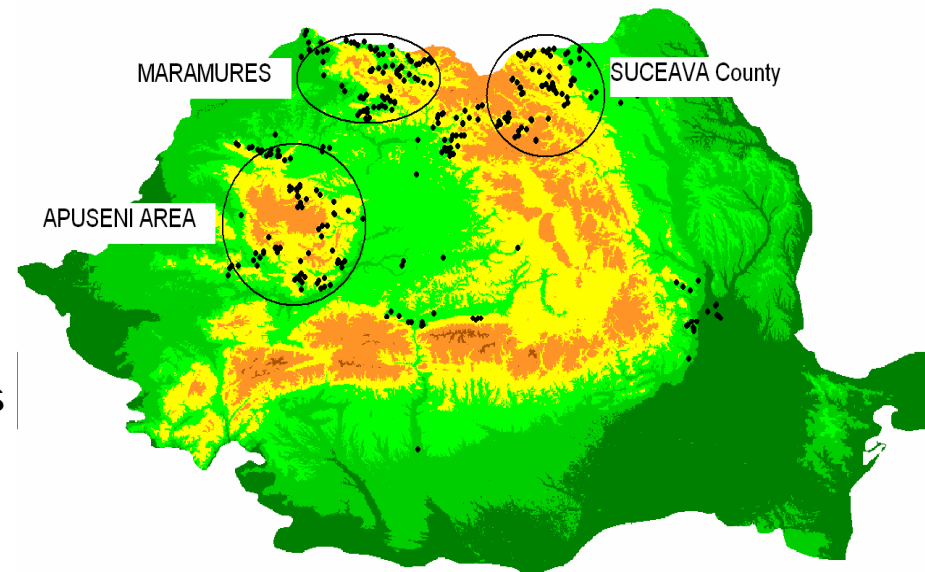
– 17

Number of surveyed counties

– 16

Number of surveyed villages

– 328



Map 1. Distribution of landrace
in Romania



In situ – on farm landrace conservation – case study from Romania



What crops are represented by landraces?

In all major species landraces are continuously cultivated, thus:

□ wide distribution/grown on large surfaces:

- *Phaseolus vulgaris* L.
- *Zea mays* L.
- *Solanum tuberosum* L.
- *Cucurbita pepo* L.

□ wide distribution/grown on small areas:

- vegetables
- spices & medicinal plants





In situ – on farm landrace conservation – case study from Romania



What crops are represented by landraces?

narrow distribution/grown on large surfaces:

- *Hordeum vulgare* L.
- *Triticum aestivum* L.
- *Avena sativa* L.
- *Secale cereale* L.



extremely narrow distribution/grown on very small areas:

- *Triticum monococcum* L.
- *Cannabis sativa* L.



In situ – on farm landrace conservation –
Common bean (*Phaseolus vulgaris* L.) landrace
inventory in Maramures County

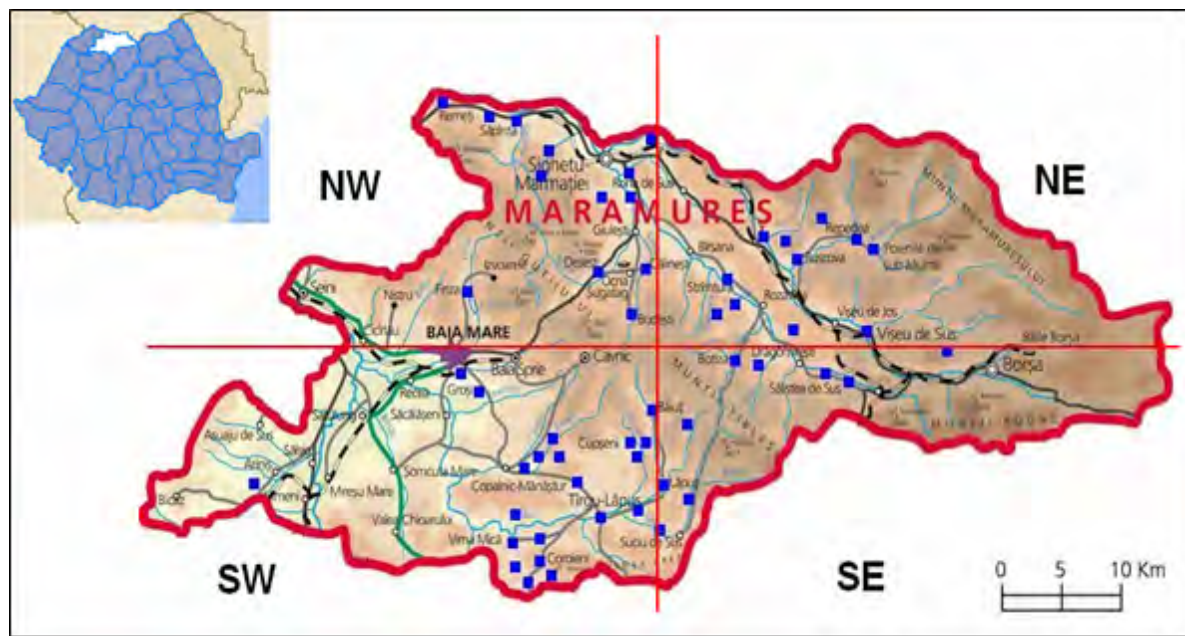
Period covered:
2000 – 2008 years

**Number of collection
trips:** 4

**Number of surveyed
villages:** 55








**Number of households
visited:** 437

**Number of bean
landraces collected:**
260 samples of which
67 were distinct varieties



Map 2. Surveyed/collecting villages across
Maramures County


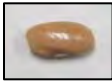







Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

COLOUR	SHAPE	SIZE	PHOTO	NO of LANDRACES
WHITE	Round	Small		4
		Large		2
	Kidney	Large		4
		Small		3
		Medium		17
	Oval	Large		6
		Small		2

Total number of landraces collected in the area:

38 (15%)








Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

COLOUR	SHAPE	SIZE	PHOTO	NO of LANDRACES
CREAM	Round	Medium		2
	Elliptic	Small		2
		Medium		1
	Kidney	Medium		7
		Large		5
	Oval	Small		1
		Medium		3
		Large		9
		Truncated	Medium	

Total number of landraces collected in the area:

34 (13%)





Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

COLOUR	SHAPE	SIZE	PHOTO	NO of LANDRACES	
BROWN	Elliptic	Small		3	
		Medium		14	
		Large		5	
	Kidney	Large		17	
		Oval	Medium		2
	Truncated	Medium	Large		5
			Medium		2

Total number of landraces collected in the area:

48 (18%)



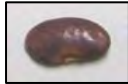

Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

COLOUR	SHAPE	SIZE	PHOTO	NO of LANDRACES
GREY	Round	Medium		2
	Elliptic	Medium		4
	Kidney	Medium		2
	Oval	Medium		2

Total number of landraces collected in the area:

10 (4%)






Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

COLOUR	SHAPE	SIZE	PHOTO	NO of LANDRACES
PURPLE	Elliptic	Large		1
		Medium		1
	Kidney	Medium		3
	Oval	Medium		4

Total number of landraces collected in the area:

9 (3%)

Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

COLOUR	SHAPE	SIZE	PHOTO	NO of LANDRACES
BLACK	Elliptic	Medium		8
		Large		1
	Kidney	Medium		3
		Large		1
	Oval	Medium		4

Total number of landraces collected in the area:

17 (6%)

Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

BI-COLOUR



Constant mottled - 10 (4%)



Hen eye - 10 (4%)



Pinto type - 51 (20%)



Broad striped - 23 (9%)

Total number of landraces collected in the area:

94 (37%)


Common bean (*Phaseolus vulgaris* L.) classes by colour, shape and size in Maramures County

TRI – COLOUR



Total number of landraces in the area:


10 (4%)



In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Summary of information recorded at each household

- bean is ranked as the most important crop
- in all explored sites exclusively landraces were in cultivation
- the highest morphological variability is expressed in:
 - seed colour
 - seed pattern
 - seed shape
 - seed size
- local names:
 - mazare pitica
 - mazare de ruda
 - mazare grasa
 - mazare urcatoare
 - mazare de tars



In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Summary of information recorded at each household

- **Seed supply system** – only informal sector, as:
 - own harvest – dominant
 - farmer-to-farmer exchange
 - exchange between close villages, via barter system
- **Cropping system**
 - Monocropping
 - Single variety – 3%
 - Mixed varieties of same crop – 18%
 - Intercropping
 - Maize & bean & pumpkin – 35%
 - Maize & bean – 44%


In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Cropping systems



Photos by Diana Rusu





In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Reproductive material selection criteria


□ Usually after harvest, based on phenotypical characters, at:

- seed level:
 - colour
 - shape
 - size
 - health state

In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Drying methods





In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Storage forms and facilities

Storage form	Farmers (%)	Storage facility	Farmers (%)	Storage container	Farmers (%)
Seed	40	Garret	82	Cotton sack	77
Pod	38	Pantry	16	Paper bag	3
Both	22	Barn	2	Wood bin	20

In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Cultivar uses

- ❑ 60% of harvest: self-consumption (food)
- ❑ 40% of harvest: marketing (local/ zonal markets)



Photo by M. Avramiuc

In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Gender involvement in farm activities

As a general rule – whole family takes part in farming works

□ *women' tasks:*

- seed selection
- storing seeds
- selling fresh/dry bean seeds & pods
- cooking

□ *shared tasks:*

- planting
- weeding
- harvesting

□ *men' tasks:*

- land preparation planting
- fertilizers application weeding



Photo by Diana Rusu


In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Who is keeping local knowledge?



Photo by Diana Rusu





In situ – on farm landrace conservation – Common bean (*Phaseolus vulgaris* L.) landrace inventory in Maramures County

Why the landraces are still grown?

- Tradition
- Limited access to the seed market
- New varieties are not always well adapted to the poor soils and climate change
- Traditional varieties are regarded as having better qualities
- Lack of information on improved cultivars

Ethnographic and Folk elements





Concluding remarks

- Activities related to on-farm conservation in the crops important for Romanian agriculture are not sustained by formal agricultural sector, and peasants are the only “actors” maintaining and managing genetic diversity in their fields.
- Farmers in Maramures County preserve a large amount of variability in bean (*Phaseolus vulgaris* L.) landraces, through continued cultivation and using.
- Rural people practicing agriculture assess crops diversity in functional terms, the varieties chosen to be planted each year being closely linked to the family needs and market demands.
- Variety name can not be used as proxy indicator of diversity in *Phaseolus vulgaris* L.
- Because no single conservation way is complete there is a need for coordinated conservation action, based on the two approaches, *in situ* & *ex situ*



Recommendations

- ❑ Start conservation activities by inventorying traditional varieties and landraces that are still grown on farms/home gardens
 - ❑ Develop and implement action plans/programmes focused on:
 - ❑ conservation
 - ❑ sustainable use
 - ❑ Build any initiative regarding biodiversity conservation involving rural communities and local knowledge
 - ❑ Establish or develop back-up *ex situ* collections of all landraces conserved on-farm
 - ❑ Promote research on genetic diversity conserved on-farm, in order to promote landrace using in breeding programmes
 - ❑ Strengthen collaboration between different public/private institutions/ organizations, NGOs etc, involved in PGR activities
 - ❑ Raise awareness on the importance of on-farm conservation of landraces and traditional varieties, in the actual context of global warming
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Exercises

1. Do you have knowledge on on-farm/home garden conservation activities in your country?
 2. If yes, please, answer the following questions:
 - Where and what crops are maintained?
 - Why do need the farmers to maintain crop diversity?
 - What are the main functions of home gardens in your country?
 3. Name a common home garden plant in your country that has multiple uses!
 4. Please, consider the list of on-farm descriptors used at Suceava Gene Bank, and suggest what should be added or removed!
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