

Lebende Samen
Living Seeds e.V.

BREEDING
ORGANIC LEGUMES
IN THE
MEDITERRANEAN



ABOUT US

Non-profit association Lebende Samen - Living Seeds e.V. initiate research projects in the Mediterranean that aim at breeding nutritious and resistant organic plants for healthy yields. To finance our organic and biodynamic plant breeding programmes, conduct training programmes, establish networks and joint studies with research institutes, farmers and seed companies, we raise funds from individuals, foundations, national governments, and from the European Commission.



PROJECT GOALS

BREEDING ORGANIC LEGUMES IN THE MEDITERRANEAN

Register new cross-border varieties of legumes (broad beans and peas) in the different catalogues and

Identify populations which will be of usage for small-scale farming and could be further developed in a second step. T

Increase the usage of these crops by increasing the usage of multiple varieties and populations.

Generate knowledge of climate change resilience (drought resistance, heat resistance, carbon sequestration, nitrogen fixation).

Train the small-scale farmers how to use organic seeds for organic farming and learn to multiply open and self-pollinated seeds.

PROJECT

Milestones

2021

First seed selection,
exchange and data collection

2022

Second seed selection,
exchange and data collection

**2023
/2024**

Third seed selection,
exchange and data collection

Registration and/or
selection process of
potential varieties

Seminars and conference



PROJECT AND TRIAL LOCATIONS

- Imegdal (MBLA) S501, Imidal, Marrocos
- Merchouch (ICARDA) Merchouch, Marrocos
- Allal Tazi (INRA) Allal Tazi, Marrocos
- Idanha-a-Nova (Sementes Vivas - LSSV...)
- Mértola (MONTICOLA) 7750 Mértola, Portugal



SEED MATERIAL

Peas (*Pisum sativum* L.)



Broad Beans (*Vicia faba* L.)

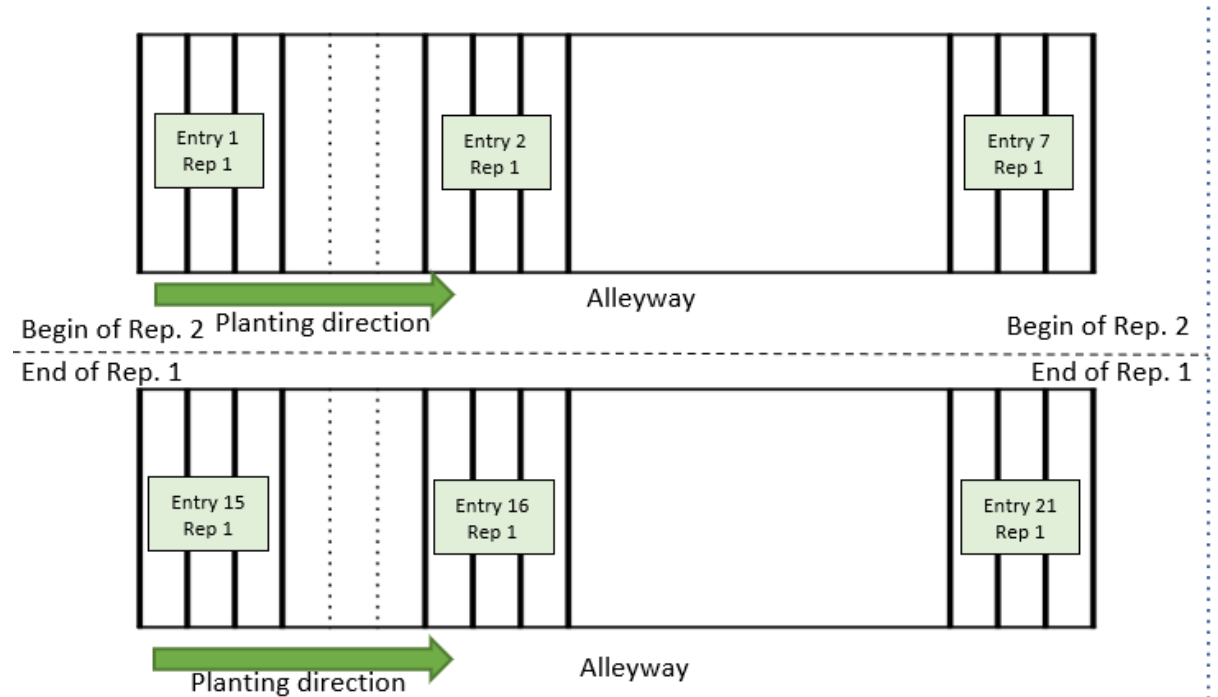


Seeds (Accessions/Landraces) from Public and Private Seed Banks from the North of Africa (Lebanon, Egypt, Morocco...) and Portugal

Criteria: Previous characterizations, Donors experience and knowledge about the material and suitability for the project

FIRST YEAR METHODOLOGY

- Establish the Experimental Design Block Design
- 12 Phenotypic Traits (Peas) + 20 Phenotypic Traits (Broad beans) + 38 Agronomical Traits/Descriptors
- Soil analysis: Physical and Chemical + Microbiological
- Temperature and Irrigation/Rain Monitoring



PISUM SATIVUM (PEA) PHENOTYPIC TRAITS

Plant: anthocyanin coloration	Growth habit	Stem fasciation	Stem length	Foliage Color	Leaf: leaflets	Flower: Color of wing (Only for Accessions with anthocyanin coloration presence)	Flower: color of standard (Only for Accessions without anthocyanin coloration presence)	Pod parchment	Pod color	Seed: predominan t shape	Seed: color of testa (Only for Accessions with anthocyanin coloration presence)
0 - Absent	1: Determinate	0: Absent	3 - short	1 - Yellow green	0: Absent	1 - white with pink	1 - White	1 - not entire	1 - Yellow	1 - Ellipsoid	1 - Reddish brown
1 - Present	2: Semi-determinate	1 - Present	5 - medium	2 - Green	1 - Present	2 - Pink	2 - Whitish cream	2 - entire	2 - Green	2 - Cylindrical	2 - Brownish
	3: Indeterminate		7 - long	3 - Blue green		3: Reddish Purple	3 - Cream		3 - Blue green	3 - Rhomboid	3 - Brownish green
									4 - Purple	4 - Irregular	

VICIA FABA (BROAD BEAN) PHENOTYPIC TRAITS

Growth habit	Stem pigmentation at flowering time	Leaflet size	Branching from basal nodes	Branching from higher nodes	Plant height	Stem colour at maturity	Flower ground colour	Intensity of streaks	Wing petal colour
1: Determinate	0: Absent	3: Small		0: Non-branching		1: Light	1: White	0: No streaks	1: Uniformly white
2: Semi-determinate	3: Weak	5: Medium		1: Branching		2: Dark	3: Violet	3: Slight	3: Uniformly coloured
3: Indeterminate	5: Intermediate	7: Large		X: Mixed			5: Dark brown	5: Moderate	5: Spotted
	7: Strong						1: Light brown	7: Intense	X: Mixed
	X: Mixed						3: Pink		
							5: Red		
							7: Yellow		
							X: Other		

Pod attitude at maturity	Pod shape	Pod surface reflectance	Pod colour at maturity	Pod length*	Maximum number of ovules per pod*	Number of seeds per pod*	Ground colour of testa*	Hilum colour*	Seed shape*
1: Erect	1: Sub-cylindrical	1: Matte	1: Light (yellow)				1: Black	1: Black	1: Flattened
3: Horizontal	2: Flattened constricted	2: Glossy	2: Dark (brown/black)				2: Dark brown	2: Colourless	2: Angular
3: Pendent	3: Flattened non-constricted	X: Mixed	X: Mixed				3: Light brown	3: Other	3: Round
X: Mixed	X: Mixed						4: Light green	X: Mixed	X: Mixed
							5: Dark green		
							6: Red		
							7: Violet		
							8: Yellow		
							9: White		
							10: Grey		
							11: Other		
							X: Mixed		

AGRONOMICAL TRAITS

Date								
Sowing	50% Emergence	First Flowering	50% Flowering	90% Flowering	First Pods	90% Pod Maturity	First Harvest	Last Harvest
Total Number Plant Number/Plot	1 to 5 Monthly Plant Vigour	Random. 5 Plants/Plot cm At Maturity Plant Height	1 to 5 Monthly Drought resistance	1 to 3 At Maturity Plant Tilt Tendency	1 to 5 Monthly Plant Health	Plant Disease/Pest ID	Random. 3 Plants/Plot	
		Total number of nodules					Total number of effective nodules	
		50% flowering stage					50% Flowering	

AGRONOMICAL TRAITS

Pods				seeds					
Random 5 Plants/Plot non destructive	Random. pods from 5 Plants/Plot	Random. pods from 5 Plants/Plot	Random. pods from 5 Plants/Plot	Random. seeds from 5 Plants/Plot	Random. seeds from 5 Plants/Plot	Random. 5 Plants/Plot	Random. 5 Plants/Plot	Random. 5 Plants/Plot	Random. 5 Plants/Plot
	g	%	cm	g	%	cm	cm	cm	$\Phi(\%) = \left(\frac{\sqrt[3]{LWT}}{L} \right)$
Total number of pods	Average Pod Weight	Average Pod Dry Matter	Average Pod Length	Average Seed Weight	Average Seed Dry Matter	Average Seed Length	Average Seed Width	Average Seed Thickness	Average Seed Sphericity

Random. 5 Plants/Plot	Total half Plot for green	Total half plot for green				Total half plot for dry			
		Random. 5 Plants/Plot	Without Pods			Random. 5 Plants/Plot	Without Pods		
Total Number	Total Number of fresh harvests/plot	Total Number Fresh Harvest	g Fresh Harvest	% Fresh Harvest	Kg Fresh Harvest	Total Number Dry Harvest	g Dry Harvest	% Dry Harvest	Kg Dry Harvest
Average Seed Number/Pod		Average Pod Number/Plant	Total Plant Weight	Total Plant Dry Matter	Total Pods Yield	Average Pod Number/Plant	Total Plant Weight	Total Plant Dry Matter	Total Dry Seeds Yield

RESULTS (BROAD BEANS)



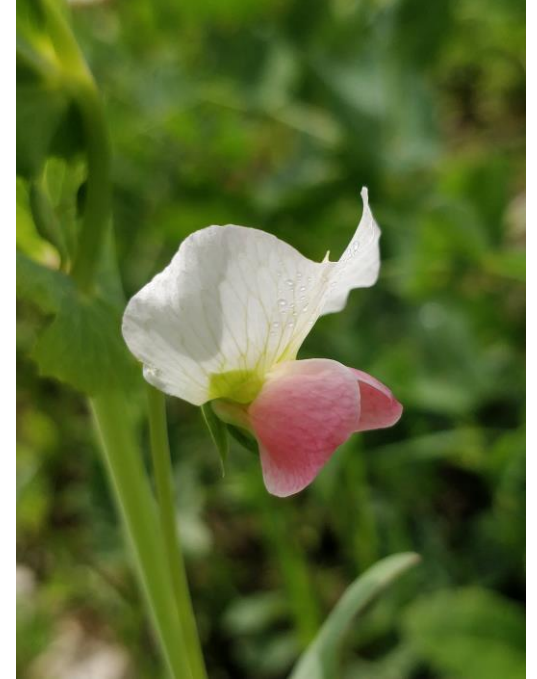
RESULTS (BROAD BEANS)



RESULTS (PEAS)



RESULTS (PEAS)



RESULTS

Around
15 000 cells (Peas and Broad Beans)
Of data created



NEXT STEPS

END OF FIRST YEAR

- Data analysis
- Criteria
- Selection
- Trial Design
- Sowing

SECOND YEAR

- Second trial
- Soil and Climate Monitoring
- New Traits and Analysis
(Nutritional values)

THIRD YEAR

Final Selection
Crossings
OHM

THANK YOU!

Lebende Samen – Living Seeds e.V.
Hölgesstraße 12
64283 Darmstadt
Germany

Phone +351 91 201 4589
info@lebendesamen.bio
www.lebendesamen.bio

Lebende Samen
Living Seeds e.V.