



Plant Genetic Resources in Portugal
Conserving the past as a guaranty the future

Ana Maria Barata

Maize WG meeting

Belgrade, 2,3 December 2019



Size
Status
Availability
Documentation level of the collection
Constraints to efficient conservation
Use and Valorization
On going projects
Legislation
Expectations

Maize WG meeting

Belgrade, 2,3 December 2019

Where we are



Main Office

Quinta do Marquês - Oeiras

Laboratories and Research Stations

1 **Pólos de Lisboa**
• Tapada da Ajuda

2 **Pólo de Merelim (BPGV)**
Braga

3 **Pólo de Vairão**
Vila do Conde

8 **Laboratório de Genética Molecular**
Alter do Chão

9 **Centro Operativo e Tecnológico do Arroz** - Salvaterra de Magos

10 **Estação Experimental António Teixeira** - Coruche

11 **Laboratório de Veterinária de Évora** - Évora

4 **Pólo de Alcobaça**

5 **Pólo de Dois Portos**
Quinta da Almoíña - Dois Portos

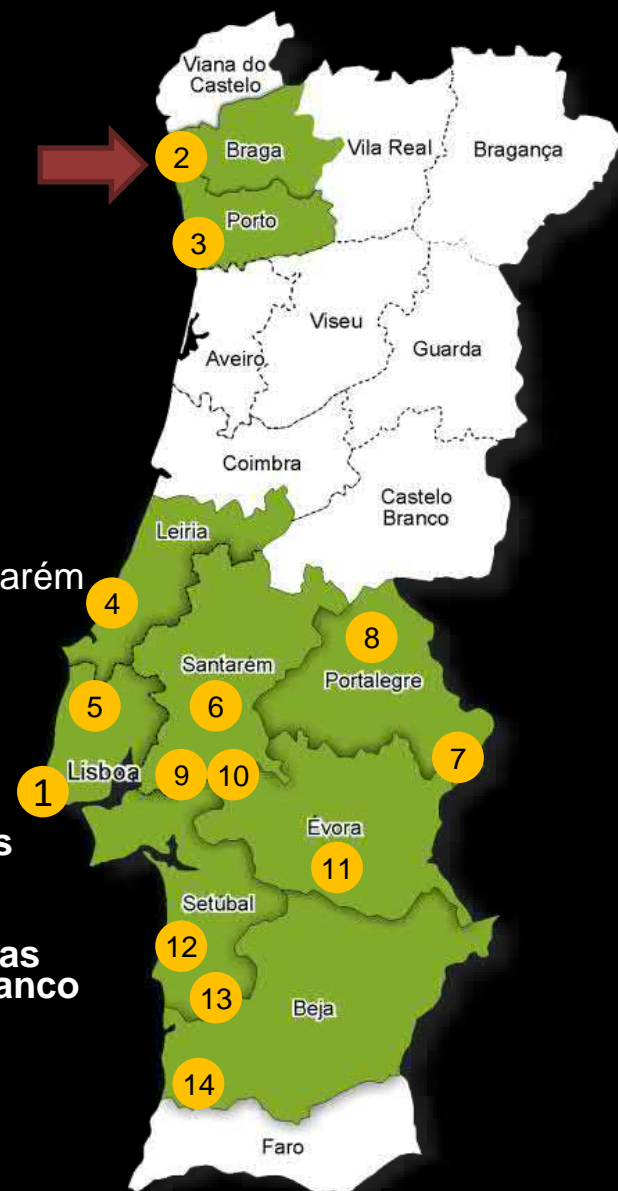
6 **Pólo de Santarém**
Quinta da Fonte Boa - Vale de Santarém

7 **Pólo de Elvas**

12 **Herdade Monte dos Alhos**
S. Domingos da Serra

13 **Posto de Culturas Regadas D. Manoel de Castello Branco**
Alvalade do Sado

14 **Herdade da Fataca**
Odemira



The cover of the National Plan for Plant Genetic Resources 2015 features a background image of terraced green hills with a small village. A large, stylized green and white wave graphic is overlaid on the bottom left. A circular inset in the center contains the title text.

**PLANO NACIONAL
PARA OS
RECURSOS GENÉTICOS
VEGETAIS**

2015



MINISTÉRIO DA AGRICULTURA
E DO MAR



Instituto Nacional de
Investigação Agrária e
Veterinária, LP



Direção-Geral de Agricultura
e Desenvolvimento Rural



Direção-Geral
de Alimentação
e Veterinária

***National Plan
for
Plant Genetic
Resources***

2015

NATIONAL COLLECTIONS NETWORK



Coleções

- 1 - Aromáticas e Medicinais; Cereais; Fibras; Forragens e Pastagens; Hortícolas; Leguminosas grão, Outras Espécies
- 2 - Cucurbitáceas
- 3 - *Lupinus*
- 4 - Fibras; Forragens e Pastagens; Leguminosas grão
- 5 - Macieiras – **Coleção de referência**
- 6 - Macieiras – **Coleção Regional**
- 7 - Pereiras – **Coleção de referência**
- 8 - Pereiras – **Coleção Regional**
- 9 - Cerejeiras, Ginjeiras – **Coleção de referência**
- 10 - Cerejeiras, Ginjeiras – **Coleção Regional**
- 11 - Ameixeiras – **Coleção Regional**
- 12 - Figueiras – **Coleção de referência**
- 13 - Amendoeira, Citrinos, Alfarrobeiras e Nespereiras, Romãzeiras, Pêros – **Coleção Regional**
- 14 - Oliveira
- 15 - Videira
- 16 - Aromáticas e Medicinais; Cereais; Fibras; Forragens e Pastagens; Hortícolas; Leguminosas grão, Outras Espécies
- 17 - *Leguminosas grão*

Instituições

- 1 Banco Português de Germoplasma Vegetal; 2 Universidade de Trás os Montes e Alto Douro; 3 Instituto Superior de Agronomia;
- 4 INIAV – Elvas; 5 DRAPC; 6 INIAV, DRAPN, DRAPALG; 7 DRAPN; 8 INIAV, DRAPN; 9 INIAV; 10 DRAPN; 11 INIAV;
- 12 DRAPALG; 13 DRAPALG; 14 INIAV, DRAPN; 15 INIAV, PORVID; 16 ISOPLEXIS, Madeira; 17 Universidade dos Açores

Legislation ??



The Portuguese Government is supporting the Plant , Animal and Forest Genetic Resources





BANCO PORTUGUÊS
DE
GERMOPLASMA VEGETAL

INSTITUTO NACIONAL
DE INVESTIGAÇÃO AGRÁRIA
E VETERINÁRIA, IP





1977

Banco Português de Germoplasma Vegetal



Genebanks in the world

More than 10 000 accessions conserved

1. China
2. Vavilov , Rússia
3. Estados Unidos
4. Índia
5. Estados Unidos
6. Canadá
7. Alemanha
8. Suécia
9. Brazil
10. Holanda
11. Polónia
12. Etiópia
13. Itália
14. Hungria
15. Japão



17. Reino Unido

18. Filipinas

19. Ucrânia

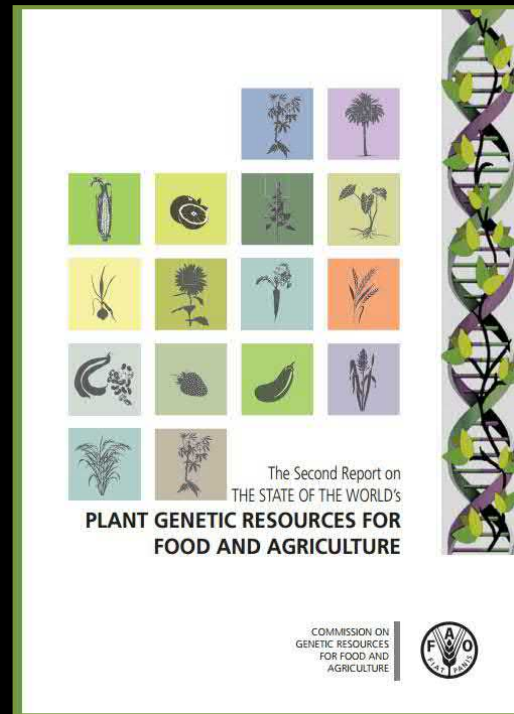
20. Austrália

**7.4 MILHÕES de accessions conserved
ex situ in 1750 genebanks**

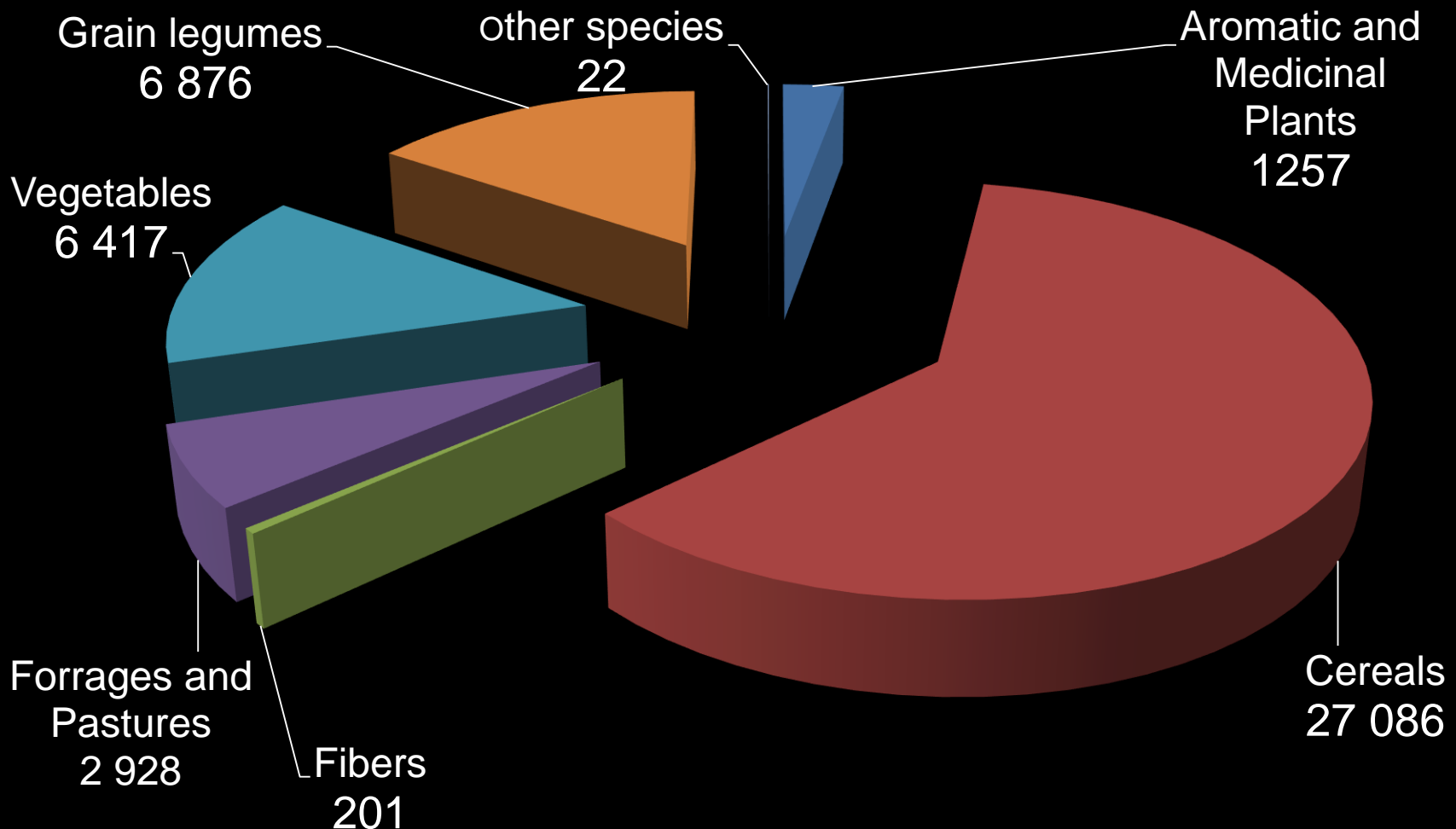
BPGV is one of 130 genebanks referred in the report

Portugal - The Collection

Group of Species	Total
Aromatic and Medicinal Plants	1 257
Cereals	27 086
Fiber	201
Forrages and Pastures	2 928
Vegetables	6 417
Grain Legumes	6 876
Other species	22
Total	44 752



Portugal - The Collection



As a result of 128 collecting missions

Maize Mediterranean Collection

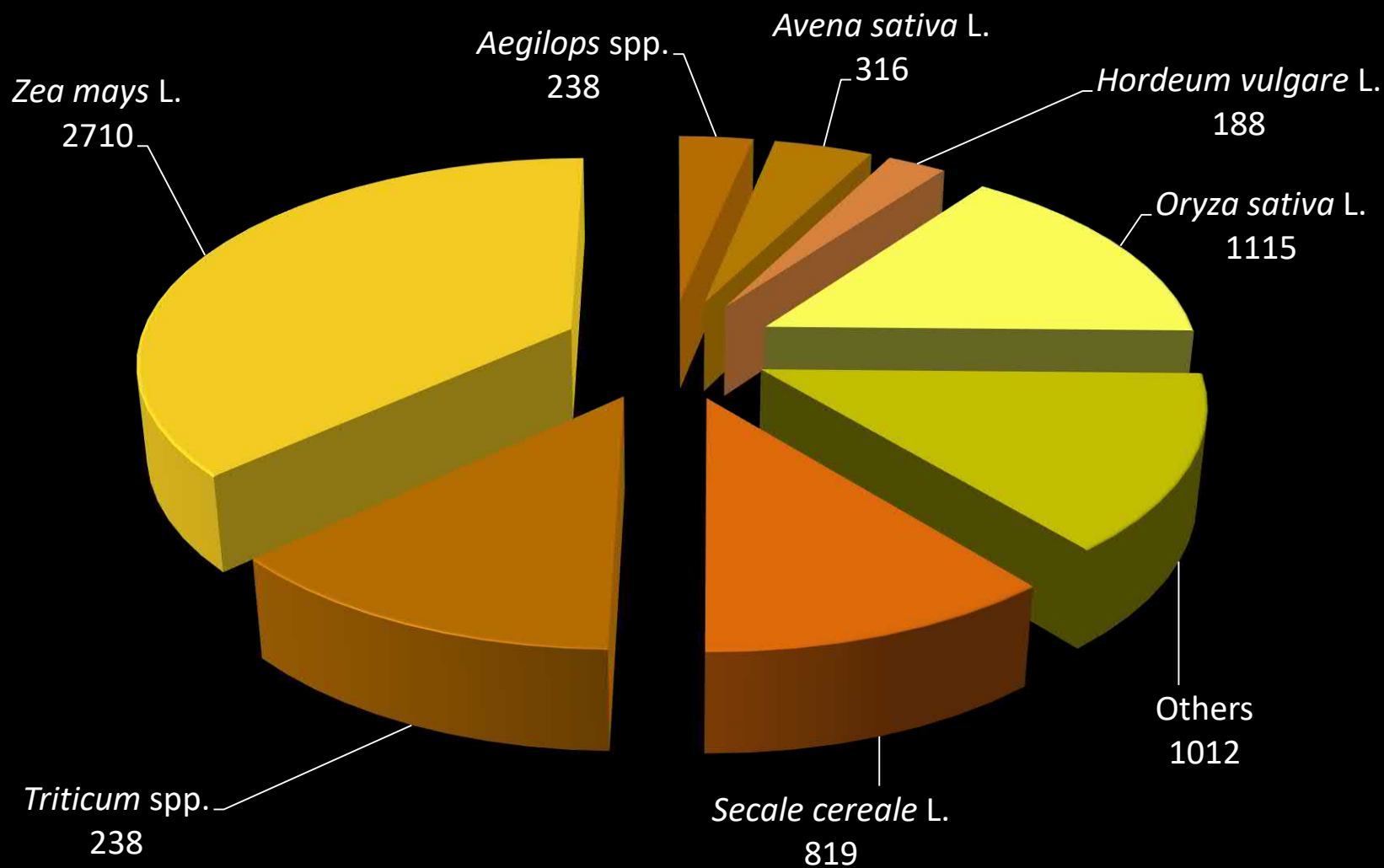


Country	Nº acessions
France	16
Germany	8
Greece	216
Italy	19
Marroco	172
Portugal	2710
Spain	193
Yemem	43
Total	3 377

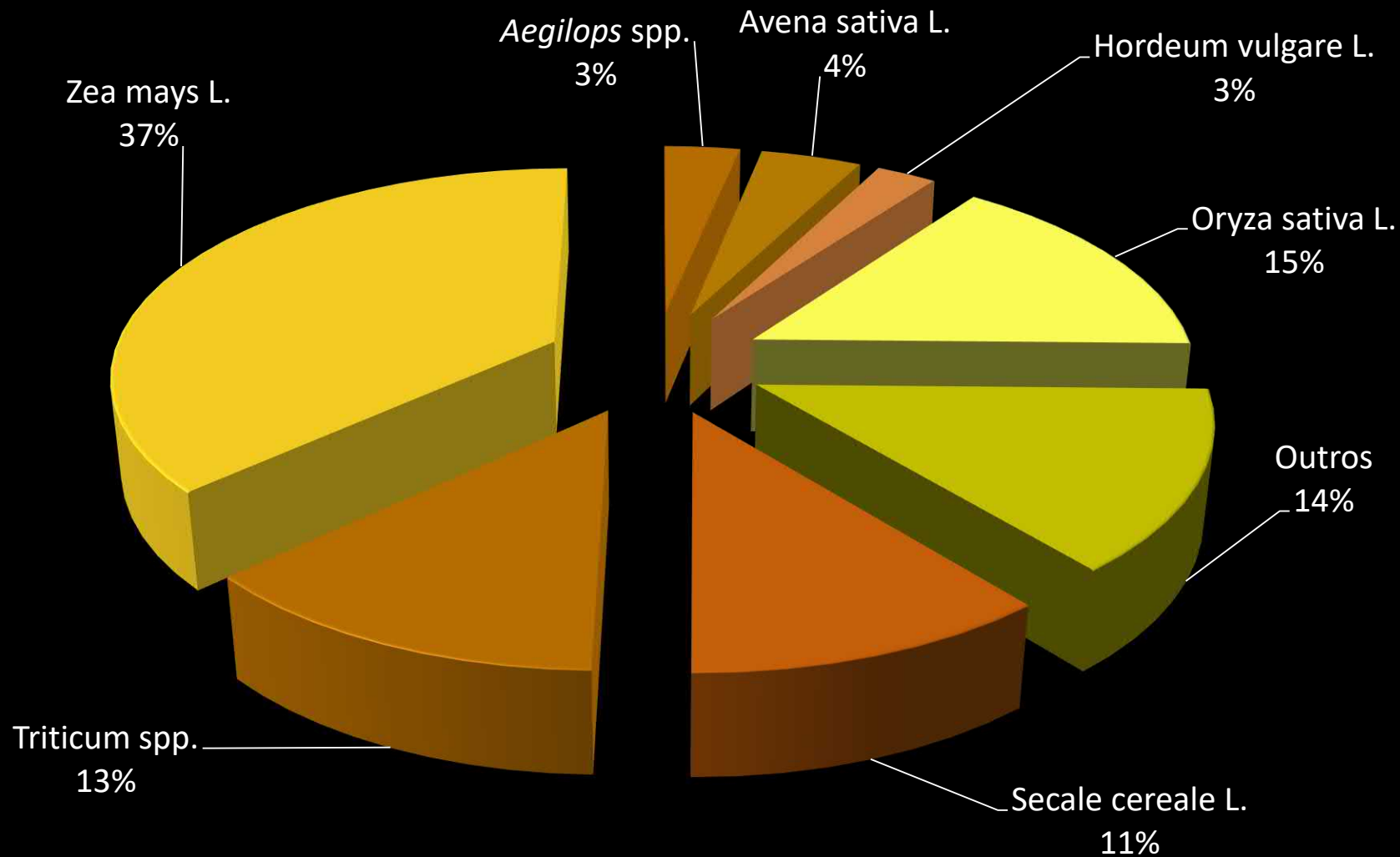
Maize European Core Collection

Country	Nº acessions
France	16
Germany	8
Greece	12
Italy	19
Portugal	17
Spain	24
Total	96

PORTUGAL CEREALS COLLECTION



PORTUGAL CEREALS COLLECTION



The Key point dates of collecting missions



1977 - Cereals landraces

1978 - Grain legumes landraces

1979 - Maize landraces in Azores

1980 to 1983 - Cereals and grain legumes
Portugal and Spain

1985 - Forage species – LR and Wild

1987 – Flax landraces

The Key point dates of collecting missions



1990 to 1994 – Vegetables International Collection

1991 - International collection cereals, grain legumes, fibers and vegetables in Madeira

1994- 1996 - Collecting genus *Allium*

1997 to 1999 - Collecting wild hops

The Key point dates of collecting missions



2000 - Collecting MAP species

2001 - International collecting genus *Daucus*;

2006 - International collecting genus *Lupinus*;

2009 to 2010 – International collecting forage, MAP, grain legumes – Portugal and Spain

2014 - Collecting crop wild relatives major crops

(*Avena*, *Daucus*, *Hordeum*, *Lathyrus*, *Lens*, *Malus*, *Medicago*, *Pisum*, and *Vicia*)

“Adapting Agriculture to Climate Change”

Kew Garden and Crop Trust

2019 - *Diplotaxis catholica* (L.) DC.; *Diplotaxis muralis* subsp. *muralis*,

Diplotaxis siifolia subsp. *vicentina* (Welw. ex Samp.) Mart.-Laborde;

Diplotaxis tenuifolia (L.) DC.; *Diplotaxis virgata* subsp. *virgata*; *Eruca*

STRATEGIES

Colleting

Conservation

Evaluation

Documentation

BANCO PORTUQUÊS
DE
CERNOPLASMA VEGETAL



Collecting Missions

Landraces



Collecting Missions

CWR - MAP- Pastures



International Collecting Missions



Banco Português de Germoplasma Vegetal



COLD



CONSERVATION



IN VITRO



FIELD



EX SITU CONSERVATION

COLD



Active
Collection



Base
Collection



Svalbard Seed Vault



February 2018
217 maize accessions



EX SITU CONSERVATION
Field collection



Humulus lupulus L.

EX SITU CONSERVATION

Field Collection



Matricaria chamomilla L.

Nome comum: Camomila



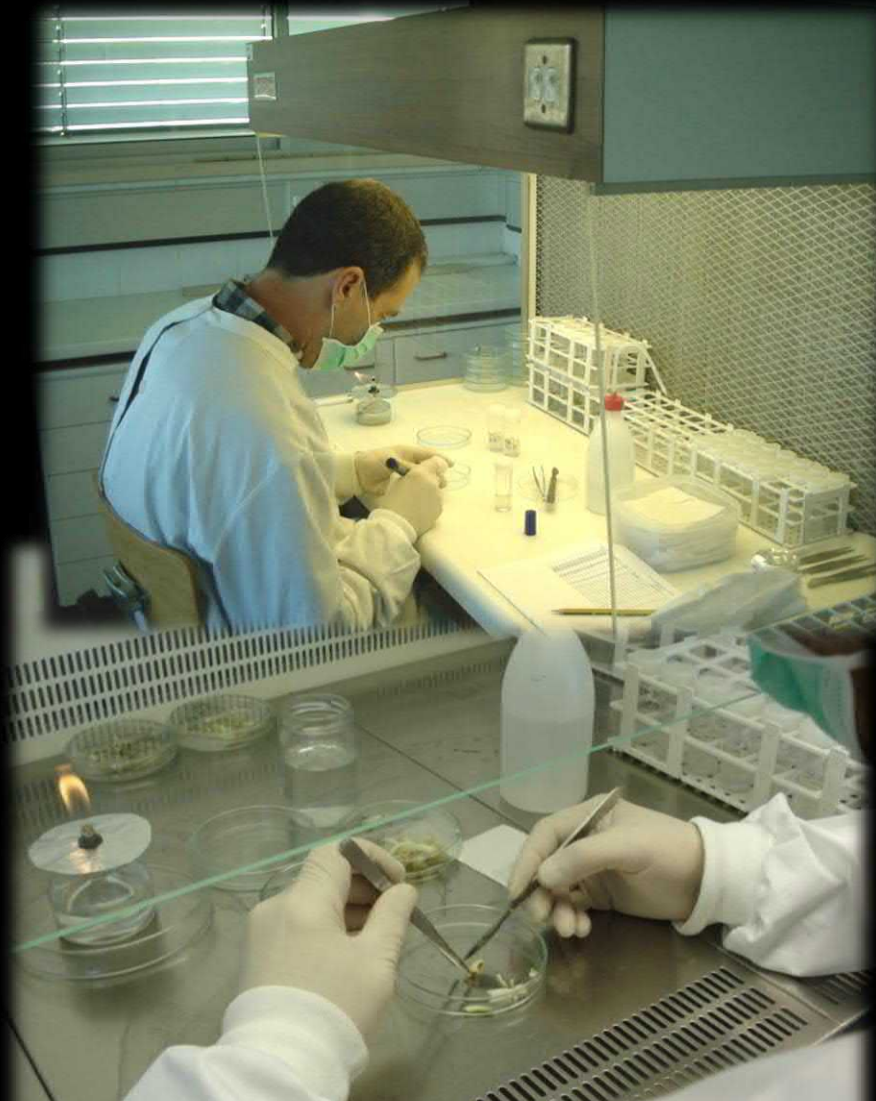
Mentha cervina L.

Nome comum: Erva peixeira

Origanum vulgare L.

Nome comum: Oregão

In vitro Conservation



Morphological Evaluation

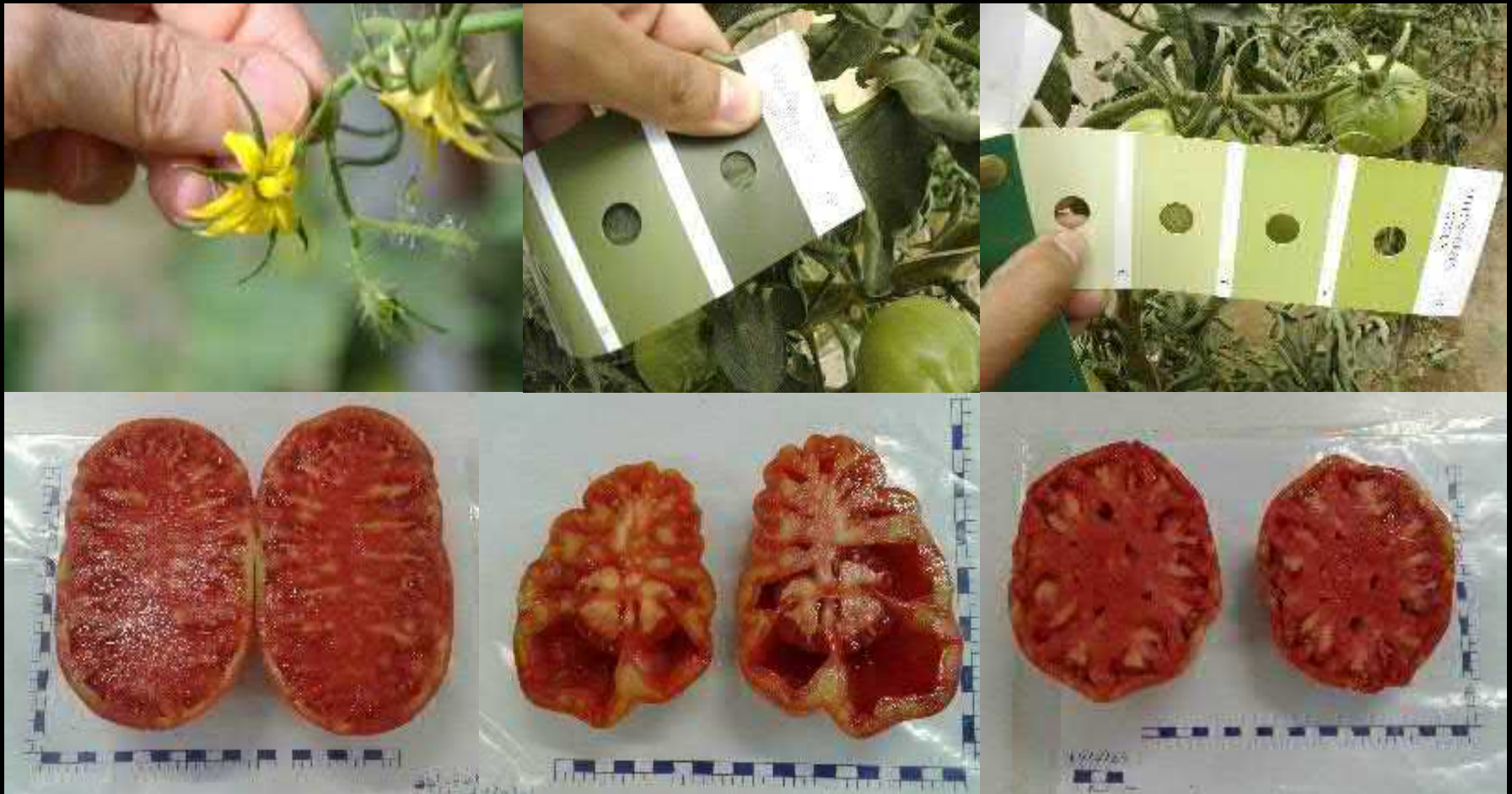
Phaseolus vulgaris L.



Morphological Evaluation



Solanum lycopersicum L.



Morphological Evaluation



Capsicum spp.



Morphological Evaluation

Zea mays L.



DOCUMENTATION



instituto nacional de
investigação agrária e veterinária



INICIO

QUEM SOMOS

INVESTIGAÇÃO

LABORATÓRIOS DE REFERÊNCIA

SERVIÇOS & PRODUTOS

BOLSAS

DIVULGAÇÃO

EVENTOS

Menu de Topo > Quem Somos > Unidades Estratégicas > Biotecnologia e Recursos Genéticos > Recursos Genéticos Vegetais-Plataforma on-line

Pesquisa



Apresentação

Unidades Estratégicas

> Biotecnologia e Recursos Genéticos

> Tecnologia e Segurança Alimentar

> Sistemas Agrários e Florestais e Sanidade Vegetal

> Produção e Saúde Animal

Polos de Atividade e Serviços desconcentrados

Qualidade

Recursos humanos

Instrumentos de Gestão

Legislação

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ONDE ESTAMOS

LIGAÇÕES ÚTEIS

ÁREA RESERVADA

ESTRATÉGIA DO MAM PARA A INVESTIGAÇÃO E INOVAÇÃO AGROALIMENTAR

INOVAÇÃO E TRANSFERÊNCIA DO

RECURSOS GENÉTICOS VEGETAIS-PLATAFORMA ON-LINE

No âmbito das estratégias definidas no "[Plano Nacional para os Recursos Genéticos Vegetais](#)", o Banco Português de Germoplasma Vegetal (BPGV) disponibiliza o acesso à informação de conservação dos Recursos Genéticos Vegetais no País.



A informação está disponível no endereço <http://bpgv.iniaav.pt>, estando a plataforma internacional [GRIN-Global](#) enquanto ferramenta de organização e disponibilização de informação em Recursos Genéticos.

A informação agora disponibilizada resulta dum processo contínuo de atualização e incremento de conhecimento da conservação nacional de recursos genéticos vegetais.

Login for returning member. Don't have an online account? [Register Now](#) No items in cart [Contact Us](#)

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DOCUMENTATION



http://bpgv.iniaav.pt

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Banco Português de Germoplasma Vegetal

Search Accessions Search Taxonomy View Cart Reports My Account Help

Home Page Search Accessions General

Query Criteria:
Search String: Zea%

Search For: Zea% Search

Select: All, None, Inverse, Highlighted Options: Show 25 items << [276 - 300] of 501

[Login](#) for returning member. Don't have an online account? [Register Now](#)

Banco Português de Germoplasma Vegetal

Search Accessions Search Taxonomy View Cart Reports My Account Help

Group By:	Plant Name	Taxonomy	Origin
<input type="checkbox"/> Plant ID			
<input type="checkbox"/> BPGV00276	Milho branco	Zea mays	Portugal, Braga
<input type="checkbox"/> BPGV00277	Milho branco	Zea mays	Portugal, Braga
<input type="checkbox"/> BPGV00278	Milho amarelo	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00279	Milho branco amarelado	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00280	Milho branco	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00281	Milho branco pérola	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00282	Milho branco	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00283	Milho branco pérola	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00284	Milho branco amarelado	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00285	Milho branco pego	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00286	Milho amarelo	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00287	Milho branco pérola	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00288	Milho amarelo	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00289	Milho branco	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00290	Milho branco	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00291	Milho moreno	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00292	Milho amarelo	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00293	Milho branco pérola	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00294	Milho moreno	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00295	Milho branco pérola	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00296	Milho amarelo	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00297	Milho branco	Zea mays	Portugal, Viana do Castelo
<input type="checkbox"/> BPGV00298	Milho branco	Zea mays	Portugal, Viana do Castelo

BPGV00276

[Zea mays L.](#)

Collected from:	Braga Portugal
Maintained by:	Banco Português de Germoplasma Vegetal, INIAV, I.P.
NPGS received:	17-Out-1978
PI assigned:	1978
Backup location:	Bioversity International
Life form:	ANNUAL
Pedigree:	
Improvement status:	LANDRACE
Reproductive uniformity:	POPULATION
Form received:	Seed

Accession names and identifiers

Milho branco	
Type:	Local name
Group:	Cereals
Cooperator:	Rena Farias, Silas Pego, Eliseu Bettencourt E Bernardine (Chofer Da FAO), BPGV e FAN

Narrative

Milho palha média. Presença de milho rei - Backup n.º

Source History

- Accession was collected: 17-Out-1978, Braga Portugal
Locality: Abaceros Habitat: Undulate Abaceros, Prado S. Miguel - Vila Verde Latitude: 41 deg. 40 min. 59 sec. West (-8.51665667) GoogleMap.it. Elevation: 190 meters.
Collectors:
1. Rena Farias, Silas Pego, Eliseu Bettencourt E Bernardine (Chofer Da FAO), BPGV e FAN
- Accession was offered: 17-Out-1978, Portugal
Supported by:
1. [Undetermined_Agricultores](#)

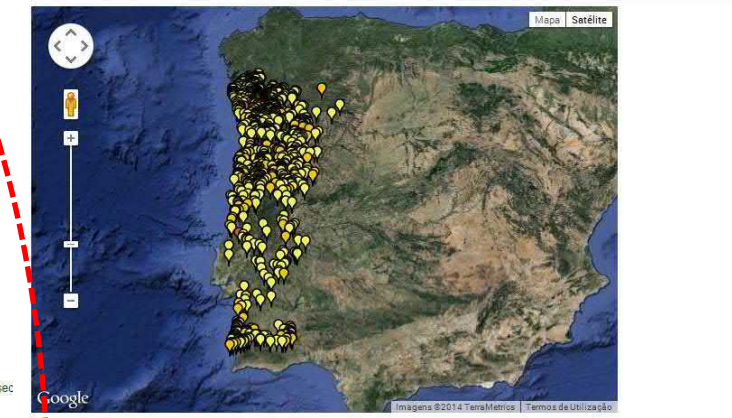
Comment: COLLNUMB: 419/78

Banco Português de Germoplasma Vegetal

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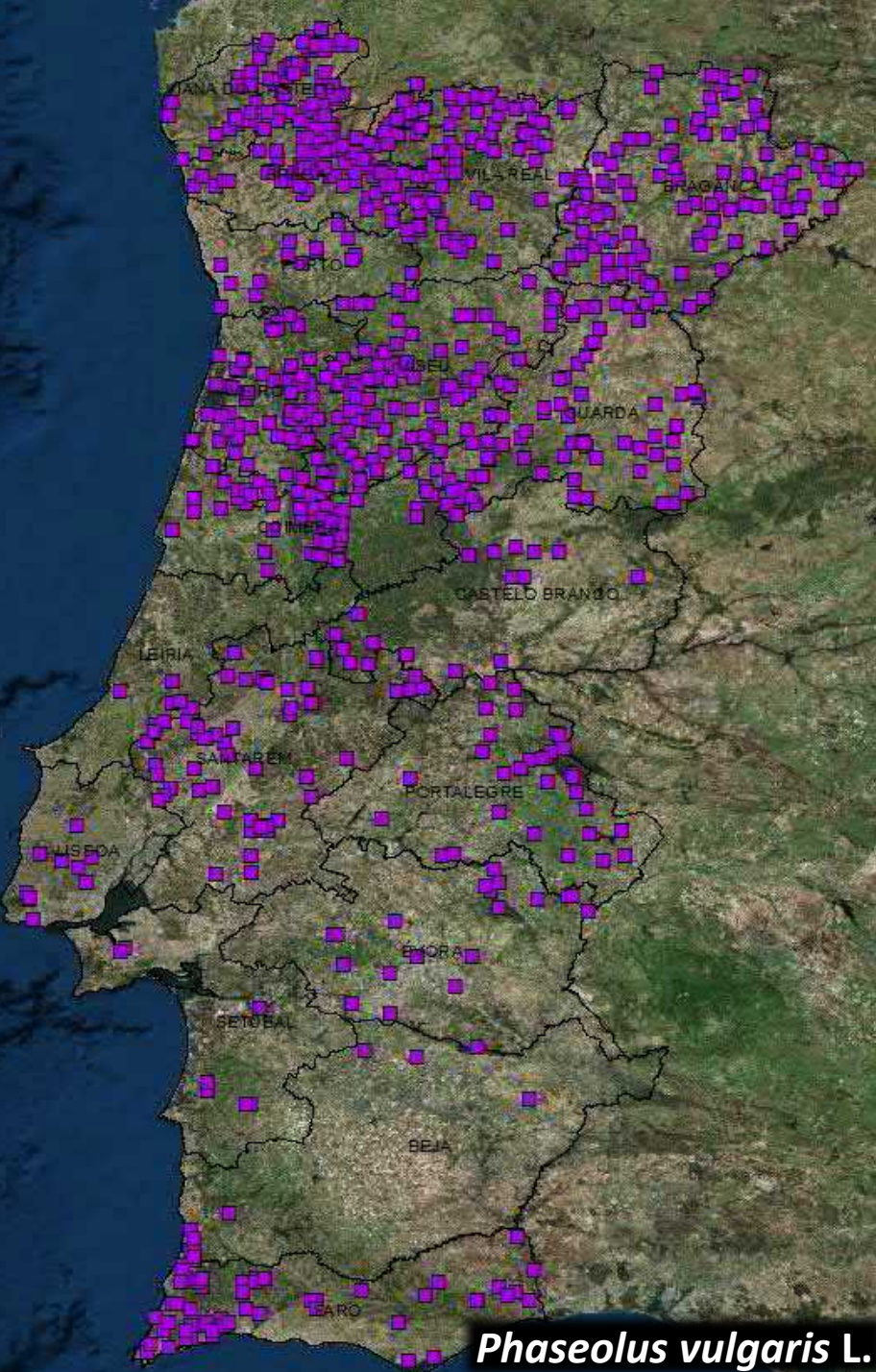
Accession for **Zea mays L.**

BPGV00276 (Mapped accessions = 1681)

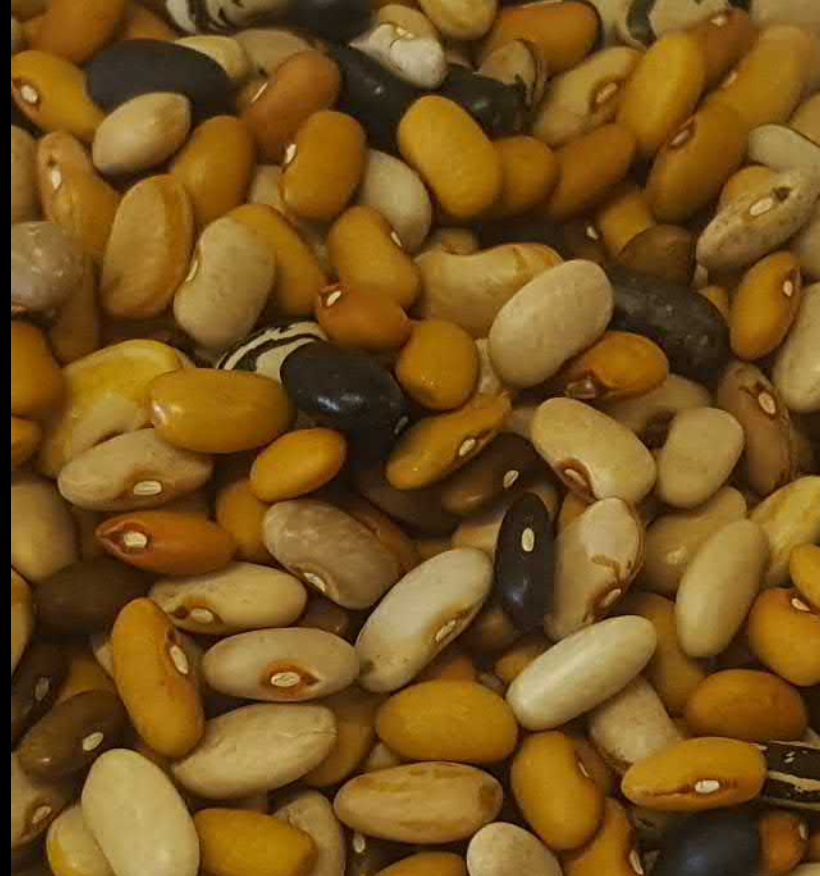


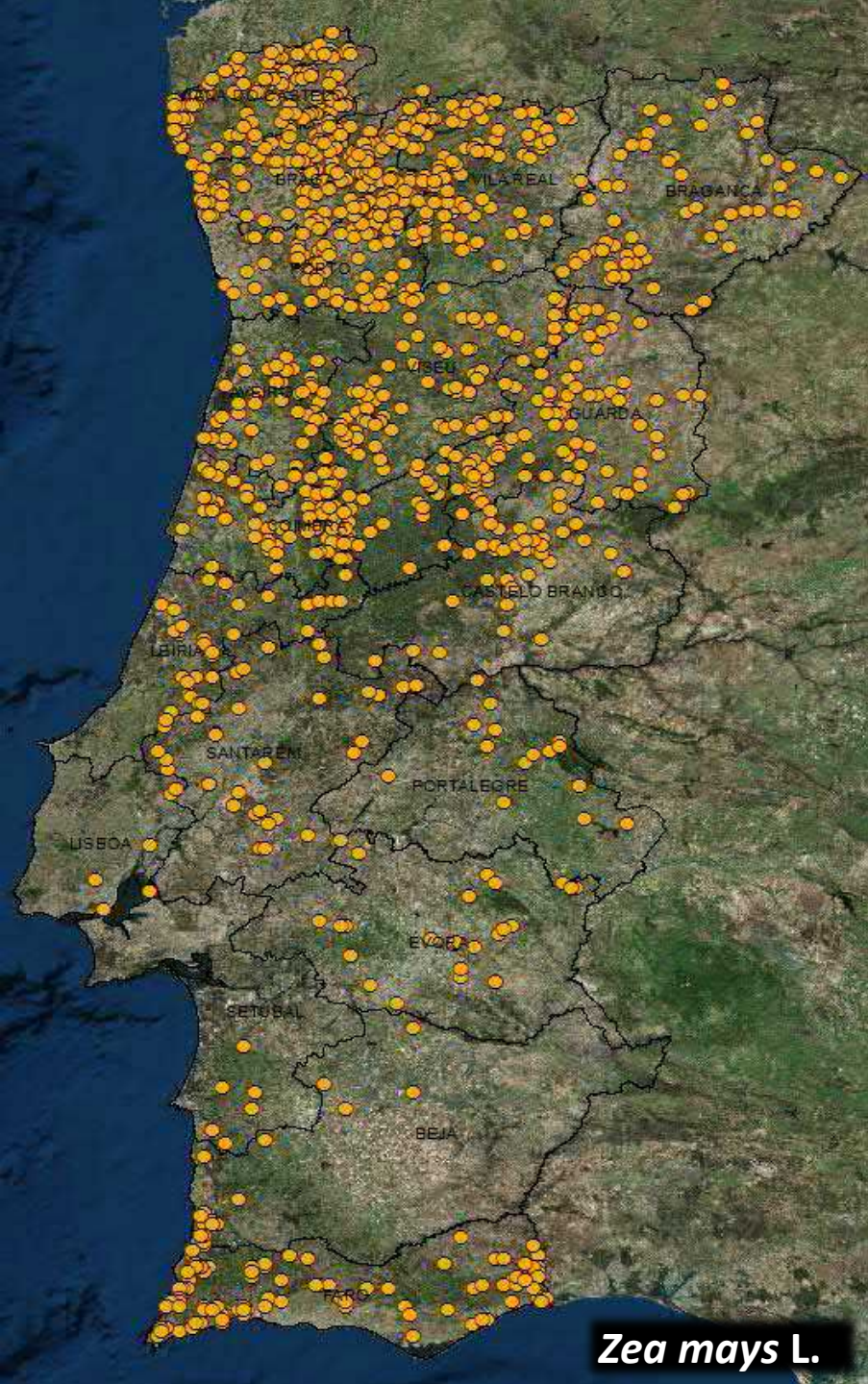
Key to symbols 1

	BPGV00276
	1 accession
	2-5 accessions
	6-10 accessions
	11-100 accessions
	> 100 accessions



Phaseolus vulgaris L.






Valorization

Maize bread from “Arcos de Valdevez”



 **Slow Food Foundation for Biodiversity**

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The Ark of Taste

[← Back to the Map](#)

Category: Bread and Oven-baked Salted Products

Broa de milho

Portugal

The Northern regions of Portugal have never been suitable for wheat growing, due to their high altitude and poor soil. Corn represented a valid alternative to wheat here, and in some farms of the Arcos de Valdevez municipality corn is still used – as it once was - to make *broa de milho* bread.

To prepare the *broa de milho* four parts of corn and one of buckwheat must be stone milled, sifted and heaped into the wooden *masseira* (kneading trough). Water and salt is added and slowly and the corn flour is kneaded with a wooden spoon (this requires strong arms as it is very stiff). When the dough has a solid structure the *masseira* is closed and the dough is left for 30 minutes to rest. The buckwheat flour is then added together with a lump of starter, and after a short knead the dough is marked with the sign of the cross and left to rise for a couple of hours.

To bake the bread, a stone oven is fired up with pine and broom wood (occasionally, but hardly ever, also eucalyptus). When it reaches the right temperature, the loaves (which have been shaped in terracotta bowls) are turned onto the oven floor and baked. The oven iron door is sealed with two long strands of bread dough, and when they turn brown the loaves are done. The crust is brown-gold, and the bread smells of toasted corn, warm yeast and caramel. Inside the crumb is solid, crumbly and has a faint yellow-grey color. This old-fashioned heavyweight bread, typical of Arcos de Valdevez, perfectly couples with sardelle or fried stockfish.

Boarded in 2005

Navigation:

- [About the project](#)
- [History](#)
- [International Ark Commission](#)
- [National Ark Commissions](#)
- [Criteria for inclusion](#)
- [FAQs](#)
- [Nominate a product](#)
- [To download](#)
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Footer: Nominations from around the world



This common bean has in its composition high values of fiber and insaturated fatty acids, which can support the reduction of colesterol and triglicerides.



Slow Food Foundation for Biodiversity

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Ark of Taste
« Back to the Map

Category: Vegetables

Tarreste bean of Sierra - Soajo and Peneda
Portugal

Tarreste bean is a small, kidney-shaped bean with thin skin. It ranges between a great variety of colors, from beige (which is the predominant color) to white, yellow, chestnut, black and red. The beans can be smooth or striped. The plant is semi-climbing, with matures relatively early crop and has small tough pods.

After cooking, the bean remains intact and is creamy and velvety inside and has a strong flavor. It can be used in soups or in dishes served with pasta or rice. A selection of traditional recipes using the Tarreste bean can be found in attachment.

This bean is rich in fiber and unsaturated fatty acids, which can help to reduce the plasmatic level of cholesterol and triglycerides.

As recent studies on Tarreste bean report: "...The analysis of the results shows that the bean helps to reduce cholesterol and triglycerides levels... this is also due to the level of fiber and other properties", "Tarreste bean is different from other varieties because it has a lower cholesterol level and a high level of acetate and butyrate" and "Tarreste bean helps to increase butyrate levels, which could help to combat the oncogenesis. This interesting topic needs to be deeply analyzed in the future".

Tarreste bean is cultivated on terraced slopes, where work continues to be done manually as the particular landscape doesn't allow mechanized methods.

The first stage of production is preparation of the soil, which can be done manually; manure is mixed into the soil, which is then leveled and made ready for sowing seeds. Seeds are sown from April to the end of May, either by hand or with a sowing machine. Usually the bean is cultivated alongside corn, but it may be raised as a monocrop. Fertilizers added to the crop are organic and manure-based, and weeding is done by hand to avoid the use of herbicides. Harvest is carried out from August to September.

After being harvested, the beans are dried, shelled and quality controlled. After being cleaned, the beans are put into storage for one year. In order to conserve the beans, they are traditionally stored in

Nominations from around the world

Valorization

“tarreste” common bean from Arcos de Valdevez

Collection Size



<u>Collection</u>	<u>Total</u>	<u>Grin Global</u>	<u>EURISCO</u>
Populations	2710	2710	2710
Caraterization	1470	1470	1470*
Multiplication	1616	1616	1616
Lines	22250	3149	3149

* By January 2020

On going Projects



HOR 2020



EVA cereals and Vegetables

COST



SOURDOMICS



INTERREG SUDOE



“pathway for the adaptation of agricultural plant species to climate change” financed by PDR2020-20.2.3-FEADER-045843 - CAEA-AGRI

GOAL:

- Compile the data and create a pipeline of the landraces of maize conserved in BPGV;
- Make an effort in order to conduct an *in silico* pre-selection of landraces resistant to climate change (heat and drought stress), exploring the genetic wealth of local origin.
- Adopt a communication plan and create content and mechanisms to disseminate the information in a broad-spectrum to the agro-food sector.



Thank you for your attention

Banco Português de Germoplasma Vegetal
Quinta de S. José S. Pedro de Merelim
4700-859 Braga
PORTUGAL
polo.merelim@iniav.pt

