

# Cryopreservation at BPGV



Octávio Serra

Prague 3-4 May 2023, ECPGR Cryopreservation WG - 1<sup>st</sup> meeting



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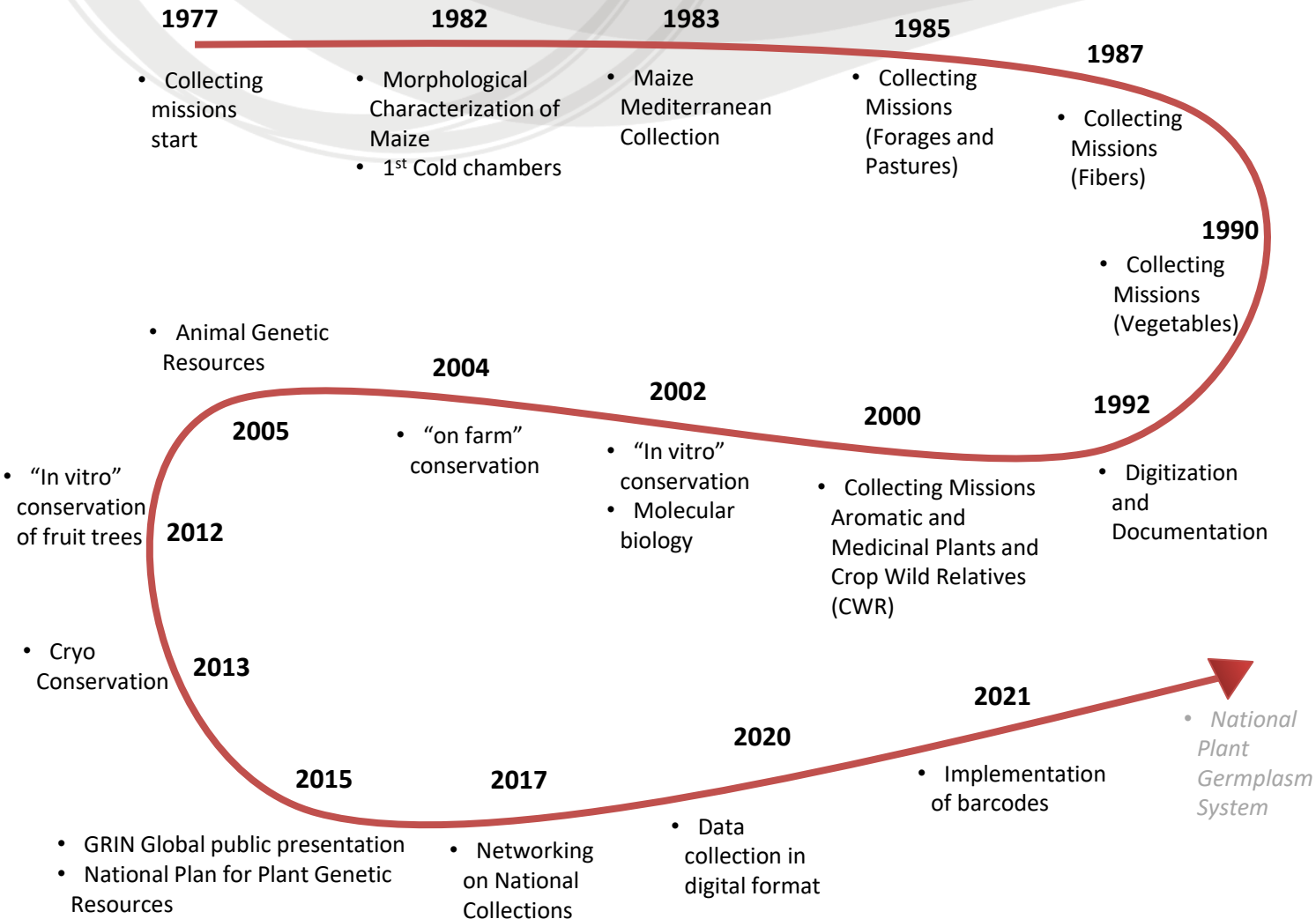
# BPGV: The Portuguese Plant Genebank





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# The History of the BPGV





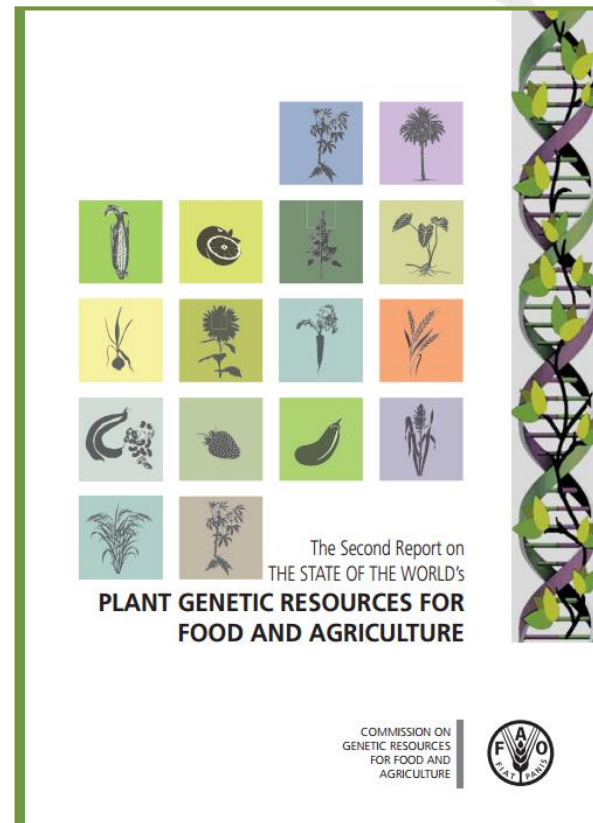
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# BPGV Collections

## Group of species

## Total

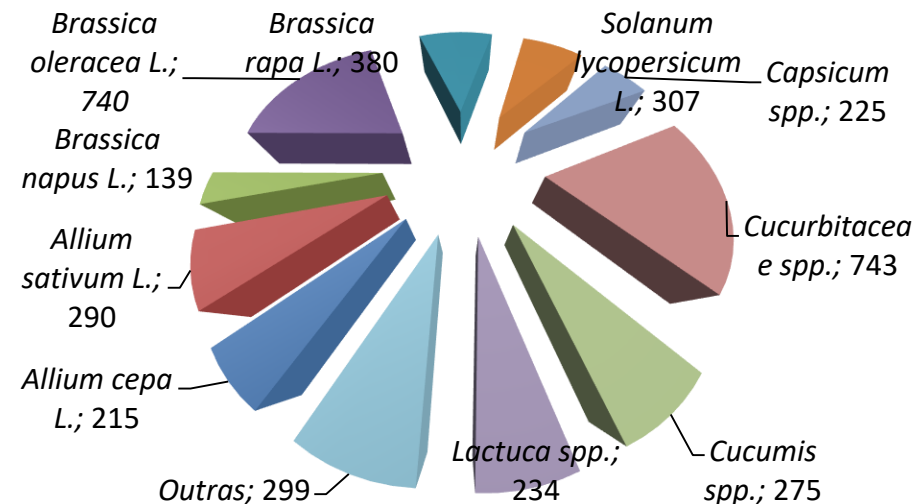
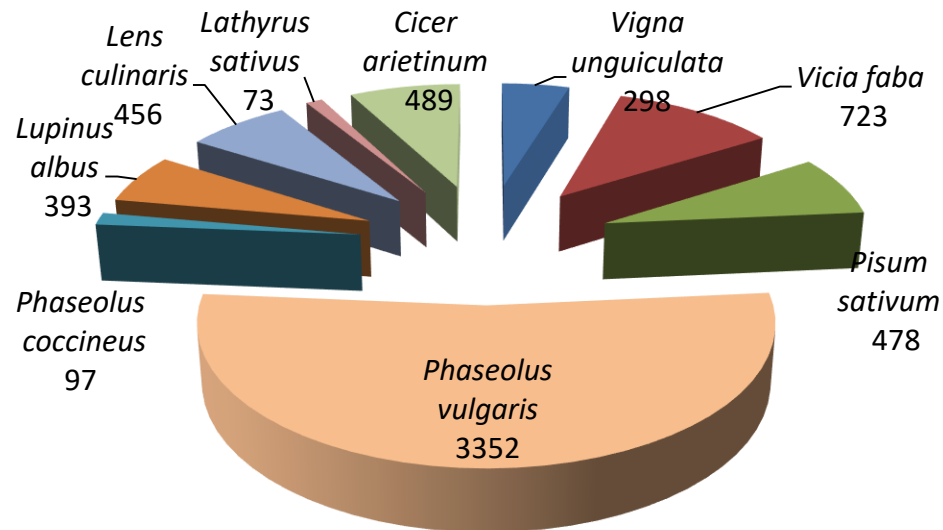
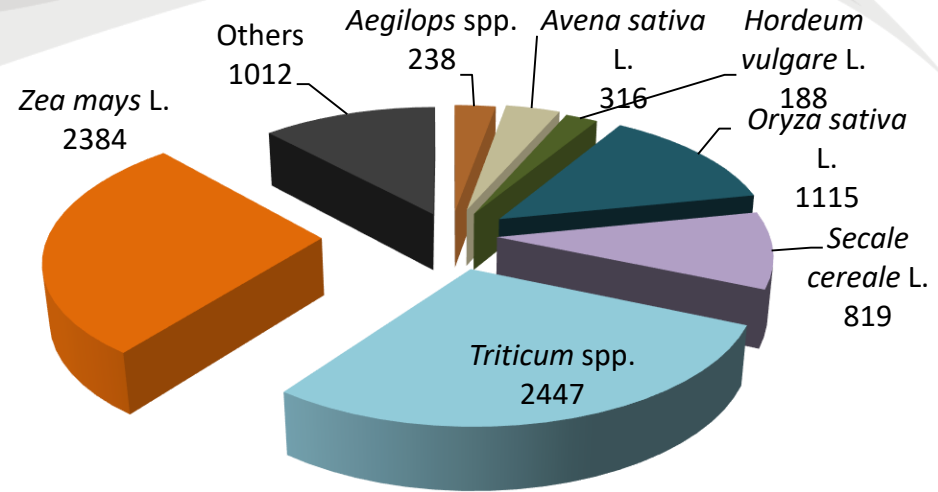
Aromatic and Medicinal Plants	1 257
Cereals	27 086
Fibers	201
Pastures and Forrages	2 928
Vegetables	6 417
Grain Legumes	6 876
Others	22
<b>Total</b>	<b>44 752</b>

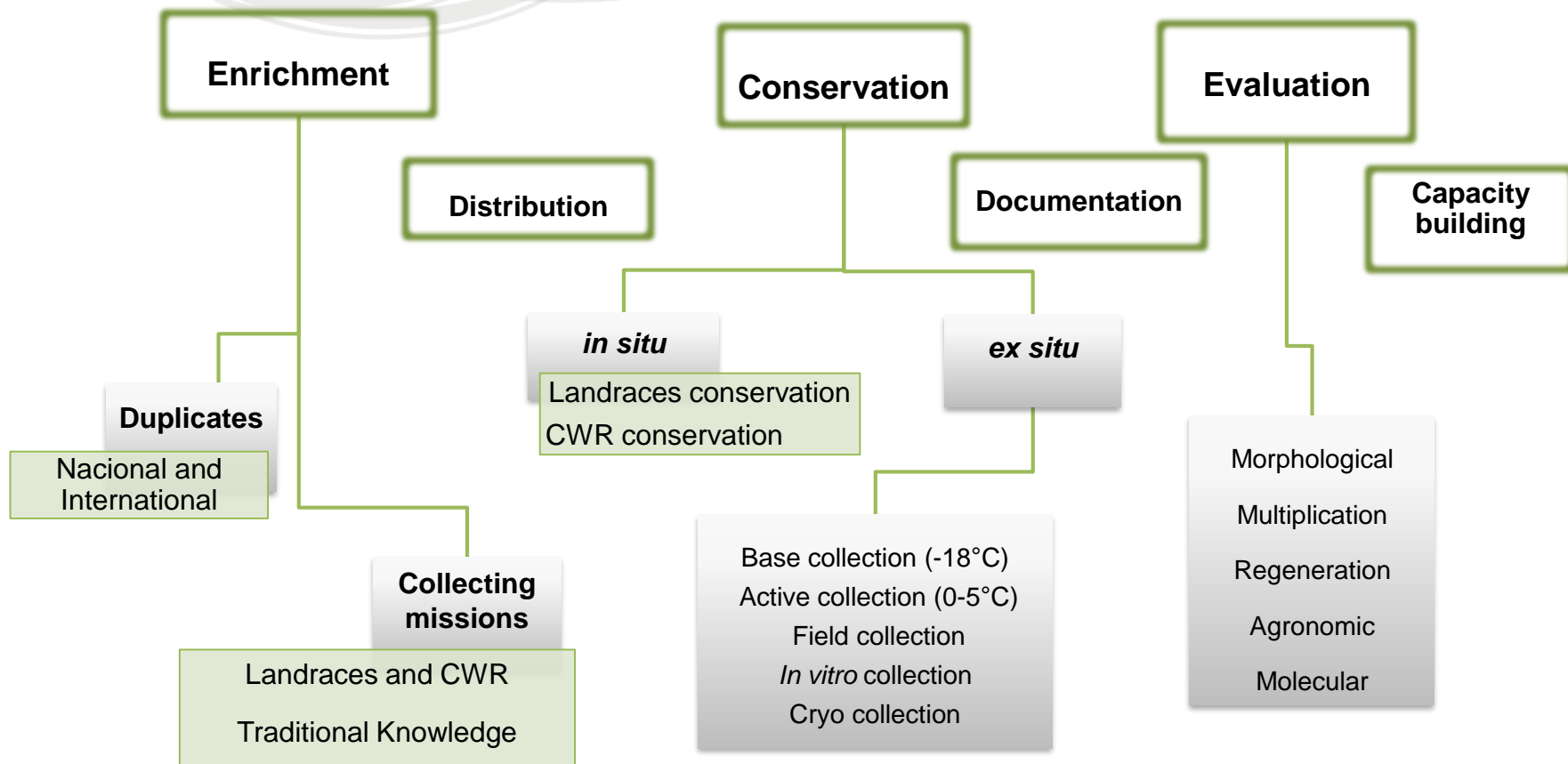




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# BPGV Collections







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# *ex situ* conservation

## Conservation *Ex situ*



Cold



Field collection



In vitro



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## Cold conditions



Active  
Collection  
(0-5°C)



Base  
Collection  
(-18°C)







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# Field collections



*Allium sativum* L.



*Humulus lupulus* L.



*Mentha cervina* L.

*Oregano vulgare* L.

*Matricaria chamomilla* L.



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# *In vitro* conservation

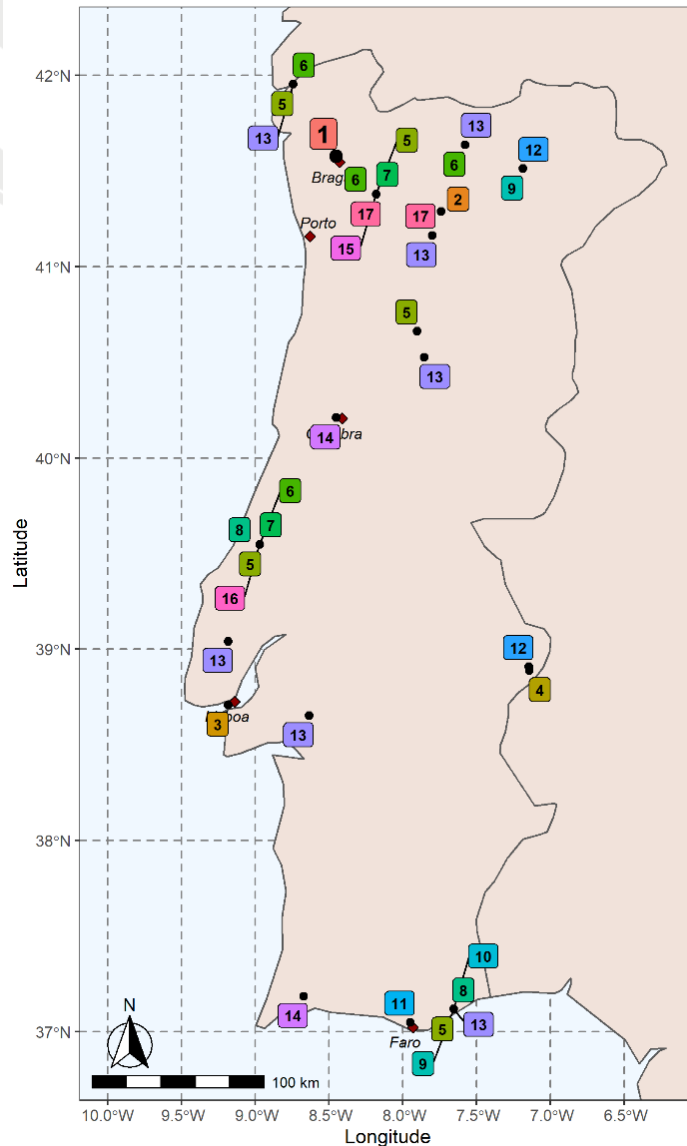
- Allium collection (286 acc.)
- *Pyrus communis* collection (105 acc.)
- *Malus domestica* (1 acc.)





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# The collections of Plant Genetic Resources for food and agriculture in Portugal



## Collections

- |    |  |
|----|--|
| 1  | Cereals; Grain legumes; Vegetables; Forrages; Medicinal and aromatic plantas; Fibers |
| 2  | Cucurbits  |
| 3  | Lupinus; Coffea  |
| 4  | Fibers; Forrages; Grain legumes  |
| 5  | Apples   |
| 6  | Pears  |
| 7  | Sweet cherry; Sour cherry; Persimmon; Quince   |
| 8  | Figs; loquat; Pomegranate  |
| 9  | Almonds  |
| 10 | Carob  |
| 11 | Citrus   |
| 12 | Olives   |
| 13 | Grapes   |
| 14 | Strawberry tree  |
| 15 | European hazel   |
| 16 | Walnut   |
| 17 | Chestnut   |



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# First approach to Cryopreservation

## AEGIS Project

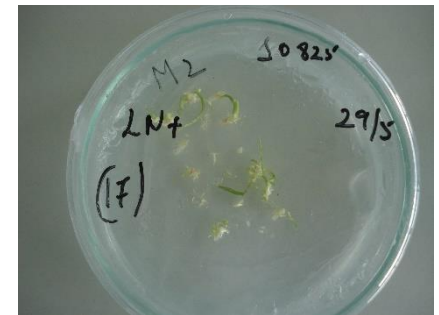
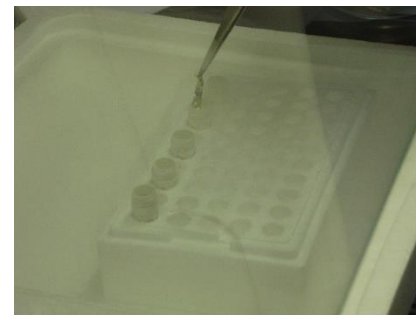
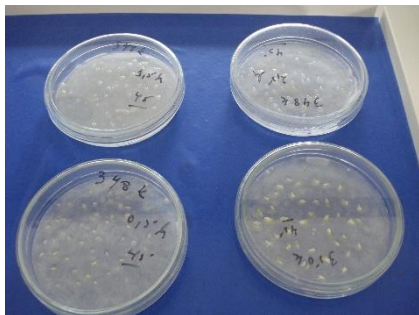
Cryopreservation of young inflorescence bases in bolting garlic for  
germplasm storage

2010

Dr. E. R. Joachim Keller, Dr. Teresa Kotlinska, Ms. Aida Reis



Droplet vitrification of immature inflorescence bases

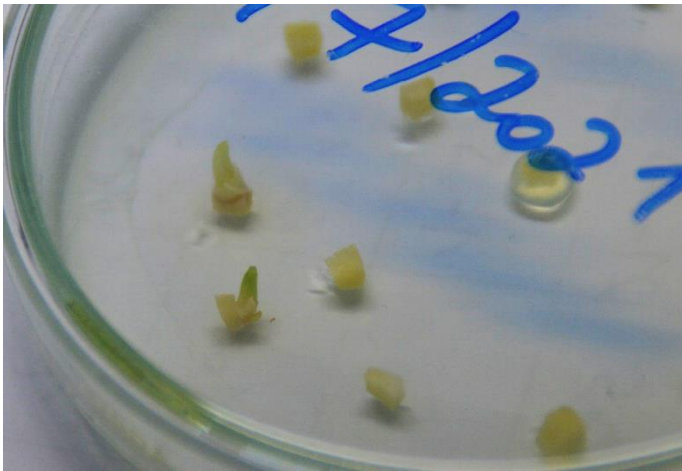




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# Current cryopreservation activities

- No dedicated projects or funding
- Crop prioritization:
  - 1 - Garlic (ongoing since 2021)**
  - 2 - Hop
  - 2 - Pears
  - 3 - Other fruit trees





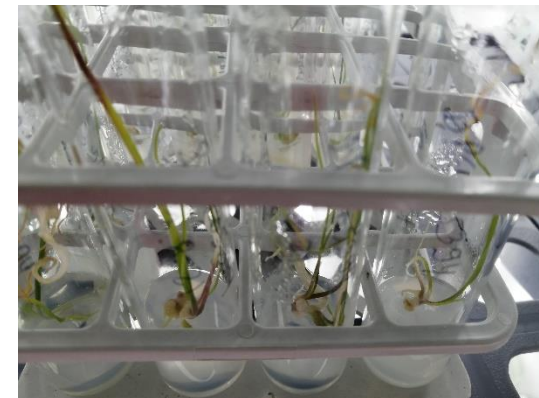
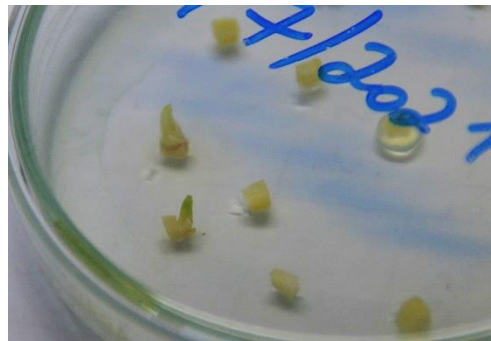
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- **Garlic (ongoing)**

Plant material: Garlic cloves

Cryopreservation method: Vitrification

Vitrification solution: PVS3

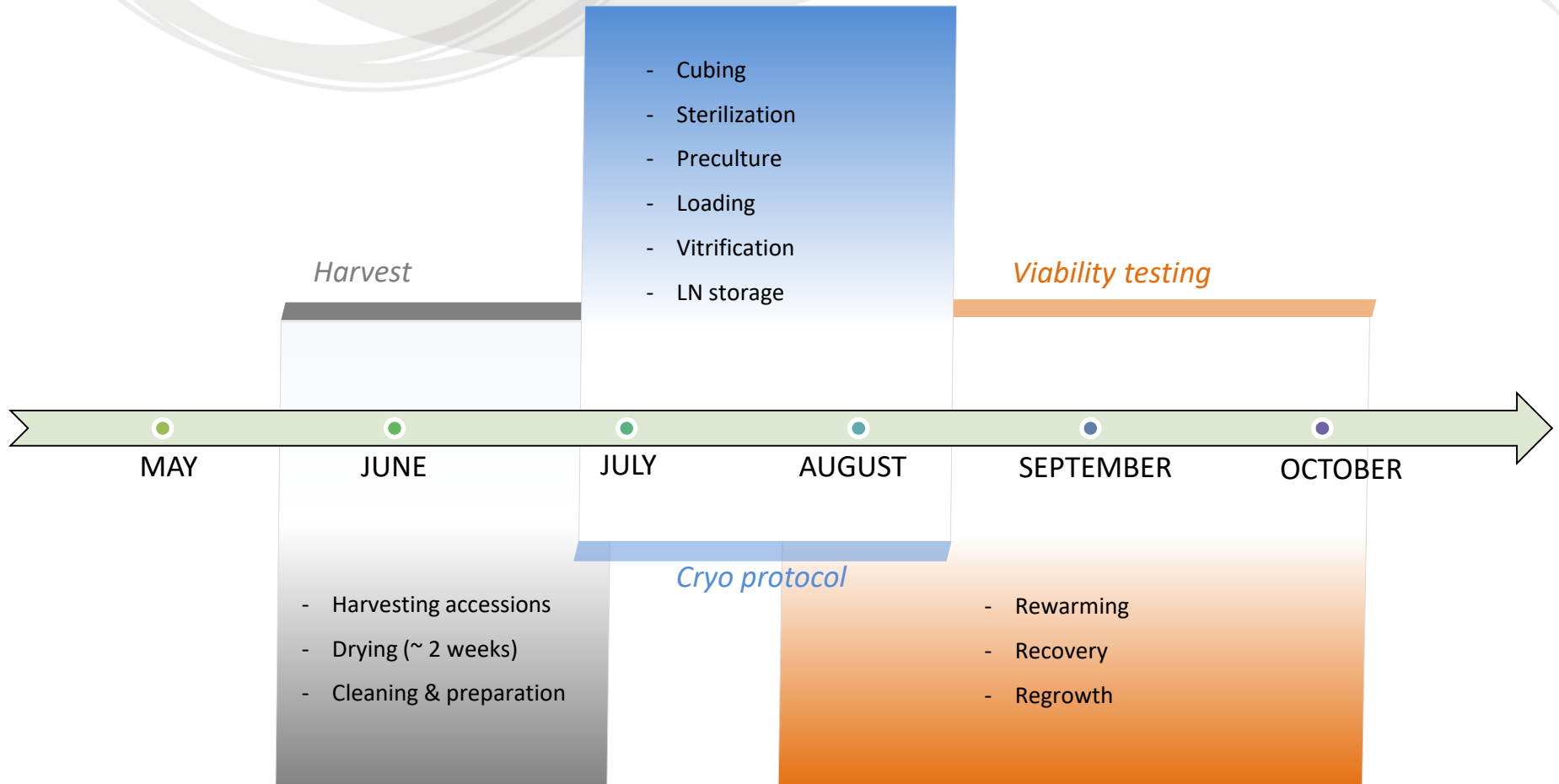


# Current cryopreservation activities



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- **Garlic (ongoing)**





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# Current cryopreservation activities

## Cryo-collection

- **Garlic**

10 accessions (2013; *droplet vitrification; immature inflorescence bases*)

10 accessions (2021; *vitrification; shoot tips*)

20 accessions (2022; *vitrification; shoot tips*)





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# Constrains limiting cryopreservation

- **BPGV is the only institution in Portugal performing pant cryopreservation**
- **Our main limitations:**
  - Human resources (assistant staff for routine tasks)
  - ~~Equipment (stereomicroscopes, horizontal flow chamber, growth chamber)~~
  - Lack of training
- **Our main advantages:**
  - Liquid nitrogen supply
  - *in vitro* lab running and plant material available
  - Motivation!



## **WG members can most likely be classified into 2 groups**

Established teams who routinely use cryopreservation

Smaller teams with little or no experience in cryopreservation

## **We suggest:**

- Training and knowledge transfer
- Identifying synergies for joint proposals and funding
- Aiming for an active network of cryopreservation experts

Thank you very much for your attention



*Feel free to write me*  
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