



# EVA

European Evaluation Network

## THE EVA EXPERIENCE AND PROSPECTS FOR PHASE XI

**Sandra Goritschnig**

EVA coordinator

*ECPGR Steering Committee*

*Oeiras, 30 May 2023*



# Topics

- The EVA project in Phase X
- Progress and achievements of EVA networks
  - Partners
  - Results
  - Dissemination
- Outlook for Phase XI
  - Feedback from partners on continuation
  - Expansion of EVA to other crops
  - Financial sustainability of EVA networks
  - Projects that contribute to extension of EVA
  - EVA steering committee

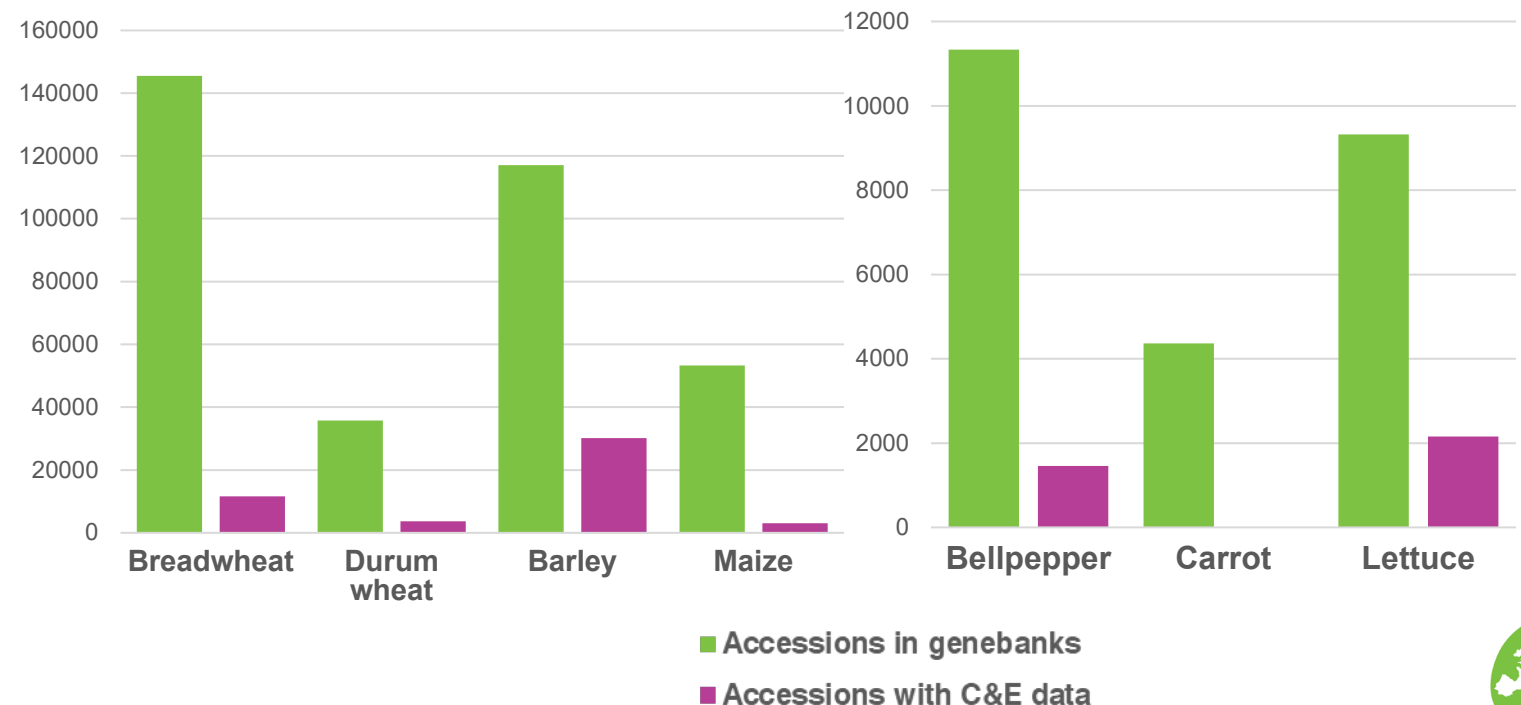
# PGRFA diversity in European Genebanks

**2,080,035** accessions listed in EURISCO  
**43** national inventories,  
**402** holding institutes  
**6,737** different genera  
**45,178** species  
**428,375** MLS accessions  
**70,188** AEGIS accessions  
**230,532** DOIs

**Limited knowledge  
of characteristics of  
European genebank  
accessions**



## EVA Crops in EURISCO



# EVA initiative aims to:

European Evaluation Network

- **Increase knowledge** on germplasm held in European genebanks
- Improve passport information and add C&E data in **EURISCO**
- Promote the **use of genebank germplasm** in research, breeding and cultivation
- Identify **climate-resilient** breeding material
- Foster cooperation between public and private sector through **MoU with Euroseeds** signed in 2018
- Widen the stakeholders involved in using PGRFA through creation of **public-private partnerships**
- Create **self-sustaining networks** that evaluate available PGRFA in continuous evaluation cycles

## PRIVATE PUBLIC PARTNERSHIPS

Increasing ECPGR knowledge and opportunities on Private Public Partnerships for the use of Plant Genetic Resources for Food and Agriculture



Federal Office for Agriculture and Food



 **Euroseeds**  
Embracing Nature



2017-  
2018

- Preparatory phase: PPP knowledge base, workshops
- **ECPGR Steering Committee approves EVA framework**
- MoU with Euroseeds

2019

- Two workshops to develop project proposals for wheat, barley and vegetables
- Germany grants project proposal for **EVA Wheat and Barley** and **EVA vegetables** for 2019–2021, starting in July 2019
- **EVA Maize** network is added through amendment of project including extension to 2022

2020 -  
2021

- EVA crop networks perform first cycles of regeneration/evaluation
- Project meetings held online due to COVID-19
- **AGENT** project extends activities of EVA Wheat and Barley to 2025
- No-cost project extension until 2023 to compensate for COVID-19 delays

2022

- First in person project meetings of all EVA networks
- EVA crop networks present first results in international conferences
- Amendment with additional funds and extension of project to 2024

2023

- Focus on final evaluations and data analysis, exploitation and dissemination
- Network discussions on continued collaborations during in-person meetings
- **ForEVA** project develops **EVA Grain Legumes Network**

2024

- Focus on data analysis, exploitation and dissemination
- Networks develop workplans for next phase
- **EURO CWR** may provide funding for EVA Carrot and Lettuce (if granted)
- **EVA Grain Legumes** Network starts



# More than 90 partners collaborate in EVA

## Private partners

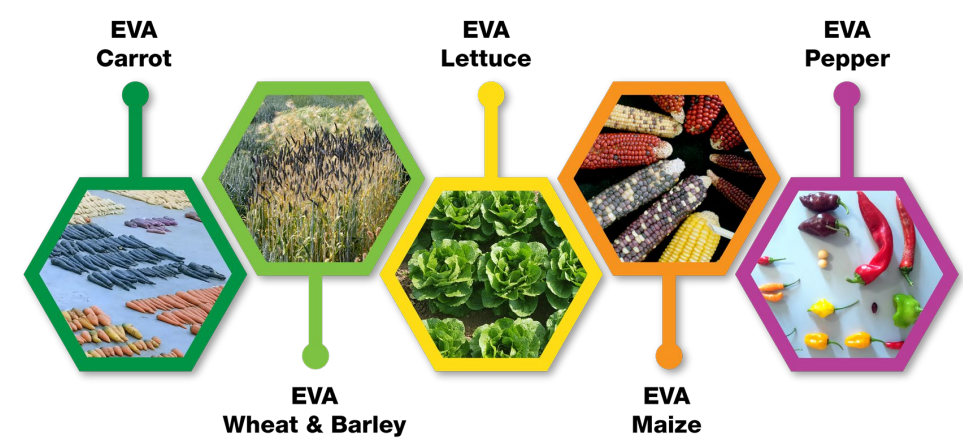
- Multinational breeding companies
- SME breeding companies
- Breeding and farming cooperatives

## Public partners:

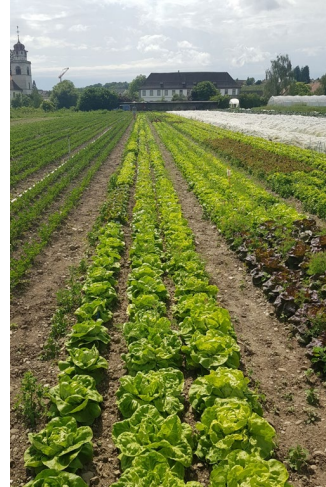
- Genebanks
- Universities and research institutes



# 109 evaluation trial sites across Europe



EVA wheat trial 2021, BASF (V. Spamer)



EVA lettuce trial 2022 *Sativa* Rheinau (C. Aichholz)



EVA pepper trial 2021, Semillas Fito (M. Fernandez)



EVA carrot trial 2021 Institut Agro Angers (E. Geoffriau)

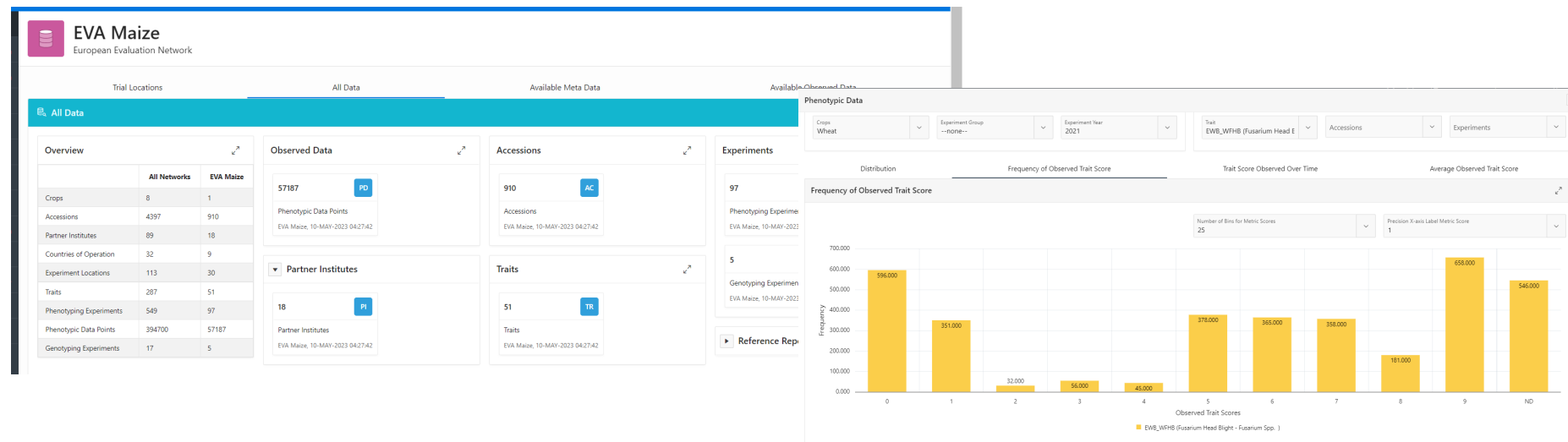


EVA maize trial 2021, CREA-CI (C. Balconi)

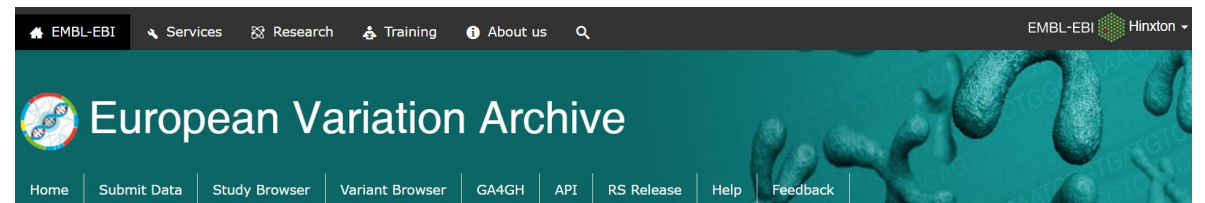


# EVA Data management

- Phenotyping data → **EURISCO-EVA** intranet compatible with EURISCO so far > 380,000 datapoints from >280 experiments



- Genotyping data → public repository **Elixir/EMBL EVA**

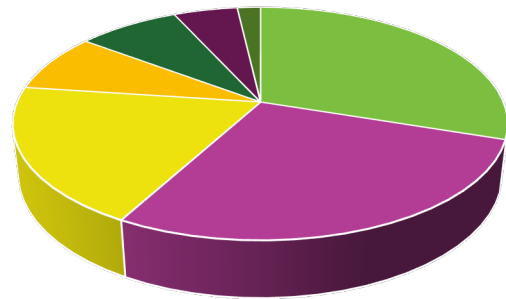






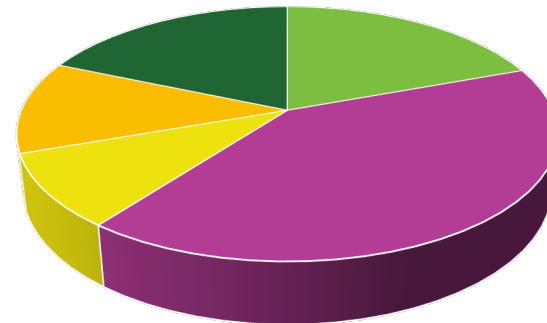
# Output of EVA networks (2020-2022)

> 3,600 EVA accessions



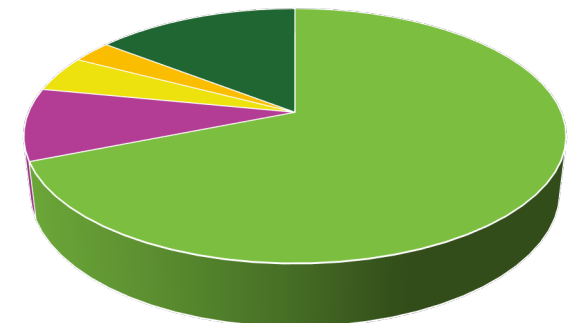
- barley
- maize
- lettuce
- carrot
- wheat
- durum wheat
- pepper

> 230 Traits evaluated



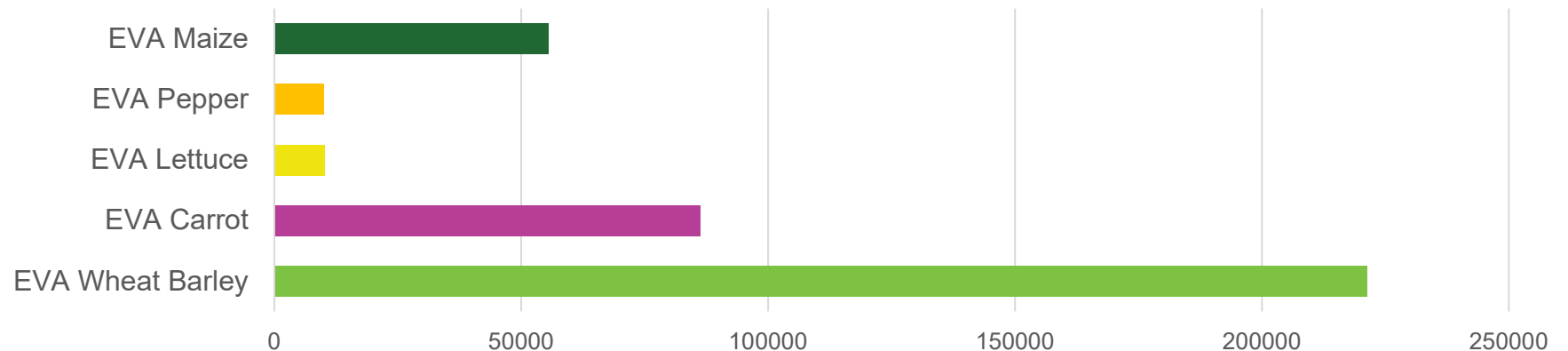
- EVA Wheat Barley
- EVA Lettuce
- EVA Maize
- EVA Carrot
- EVA Pepper

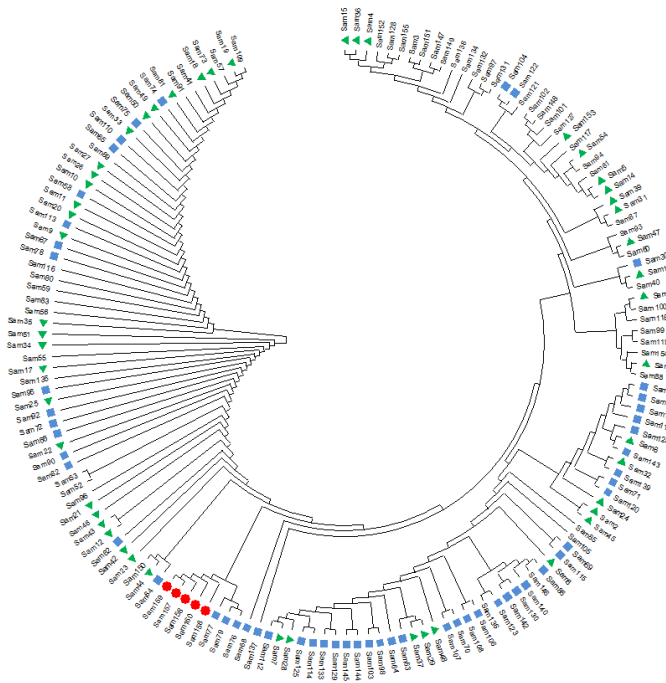
283 EVA trials



- EVA Wheat Barley
- EVA Lettuce
- EVA Maize
- EVA Carrot
- EVA Pepper

> 380.000 evaluation data points





P. Tripodi, CREA, Italy

- Genetic diversity of 160 *Lactuca* accessions evaluated in **EVA Lettuce** with new SPET genotyping assay

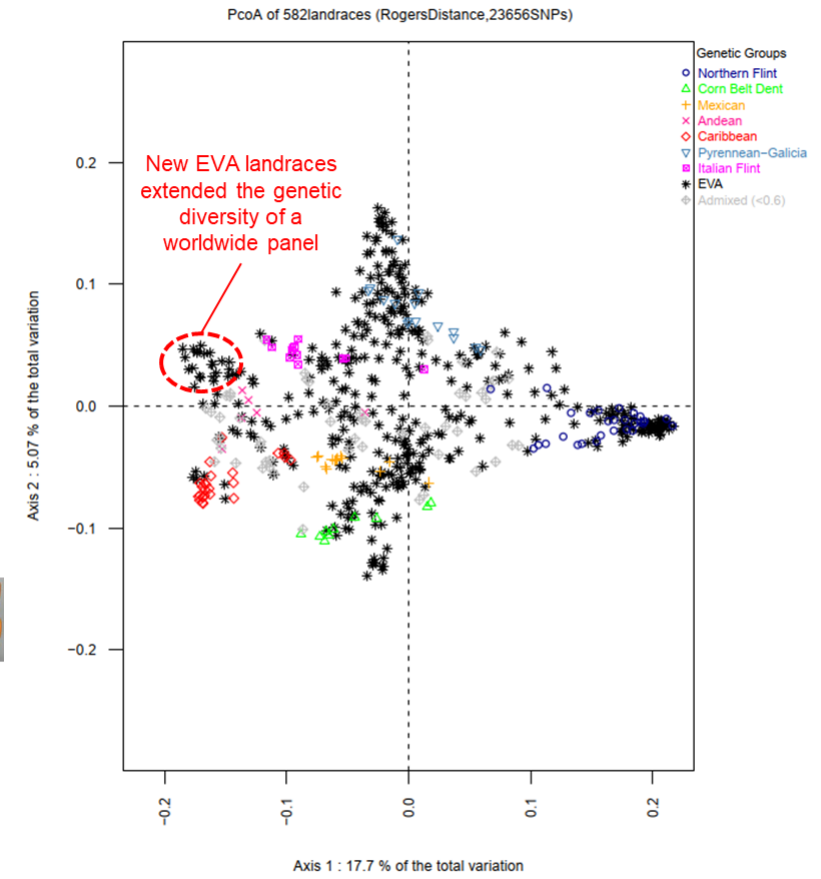
# EVA generating knowledge on European PGRFA



- Phenotypic diversity of 60 accessions evaluated in **EVA Carrot**

Photos: E. Geoffriau, Institut Agro Rennes-Angers, France

- Genetic diversity of 416 **EVA maize** landraces



D. Madur, INRAE, France

# Dissemination

## International conferences



## Publications in preparation



biology



Alliance Bioversity-CIAT, Rome, Italy; <sup>2</sup>Carosem, Cesenatico, Ital Zwaan, Aramon, France; <sup>5</sup>Vilmorin, Ledenon, France; <sup>6</sup>NordGen B.V., Warmenhuizen, The Netherlands; <sup>8</sup>Takii, Eyragues, France; <sup>9</sup>va Portugal; <sup>10</sup>OBS, Plougoum, France; <sup>11</sup>BASF, Nunhem, The Ne tute, Quedlinburg, Germany; <sup>13</sup>INIAV, Braga, Portugal; <sup>14</sup>Wz e, UK; <sup>15</sup>Institut Agro, Inrae, Université d'Angers, IRHS, Angers, F

### Abstract

The European Cooperative Programme for Plant Genetic Resources ensuring the conservation and utilization of plant genetic resources in collaborative activities. The ECPGR European Evaluation Network (EVA) was e



EVA  
European Evaluation Network

PUBLIC-PRIVATE PARTNERSHIP INVESTIGATING EUROPEAN CARROT GENETIC RESOURCES IN EVA CARROT



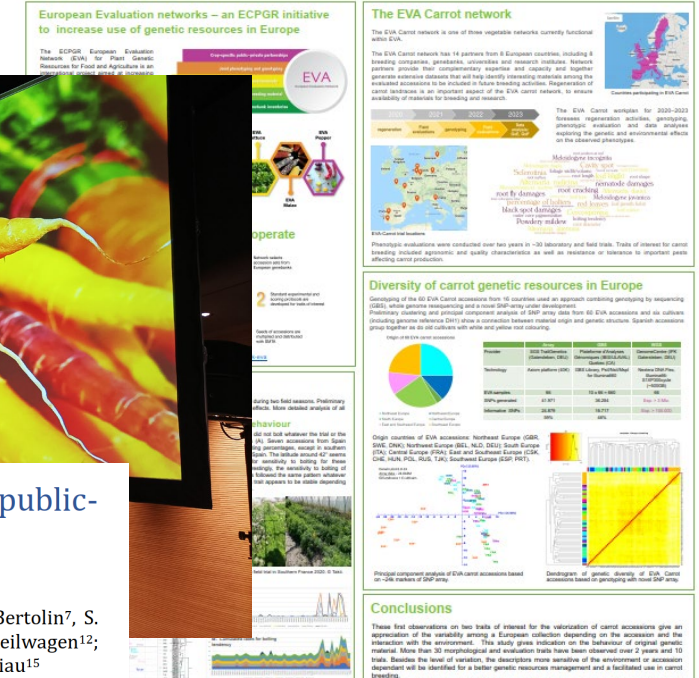
Aurélien Thabuis<sup>1</sup>, Charlotte Allender<sup>2</sup>, Nicoletta Bertolin<sup>3</sup>, Juliette Chevalier<sup>4</sup>, Micha Groenewegen<sup>5</sup>, Annette Hägnrefelt<sup>6</sup>, Aurélie Ingremau<sup>7</sup>, Violaine Lopes<sup>8</sup>, Cristina Mallor<sup>9</sup>, Thomas Nothnagel<sup>10</sup>, Paolo Pagan<sup>11</sup>, Sylvie Salgon<sup>12</sup>, Miguel Santillan Martinez<sup>13</sup>, Emmanuel Geoffriau<sup>14</sup> and Sandra Goritschnig<sup>15</sup>.

1, Rijk Zwaan, France; 2, University of Warwick, UK; 3, Bajel Zaden B.V., The Netherlands; 4, Limagrain Vegetable seeds, France; 5, Semences Vives, Portugal; 6, NordGen, Sweden; 7, CBS Innovation, France; 8, BPO/VIRAVI, Portugal; 9, CIITA-Aragón, Spain; 10, Julius Kühn Institute, Germany; 11, Carosem Italia srl, Italy; 12, Takii, France; 13, BASF Vegetable Seeds, The Netherlands; 14, Institut Agro, France; 15, ECPGR and Alliance Bioversity-CIAT, Italy.



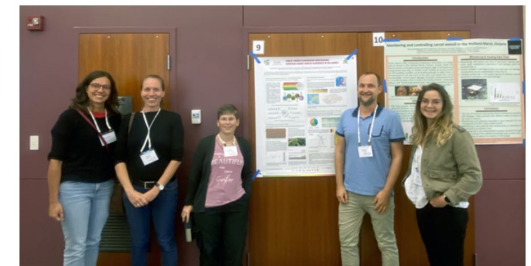
### Exploring European Carrot diversity through public-private partnerships in EVA Carrot

S. Goritschnig<sup>1</sup>, P. Pagan<sup>2</sup>, C. Mallor<sup>3</sup>, A. Thabuis<sup>4</sup>, J. Chevalier<sup>5</sup>, A. Hägnrefelt<sup>6</sup>, N. Bertolin<sup>7</sup>, S. Salgon<sup>8</sup>, M. Groenewegen<sup>9</sup>, A. Ingremau<sup>10</sup>, M. Santillan Martinez<sup>11</sup>, H. Lehnert<sup>12</sup>, J. Keilwagen<sup>12</sup>; T. Burges<sup>12</sup>; H. Budahn<sup>12</sup>, T. Nothnagel<sup>12</sup>; V. Lopes, <sup>13</sup>; C. Allender<sup>14</sup>, S. Huet<sup>15</sup>, E. Geoffriau<sup>15</sup>



### EVA Carrot network results shared at international conferences in 2022

In August 2022, the EVA Carrot network presented the first results of their joint evaluations of 60 carrot accessions at the International Horticultural Congress in Angers, France, and the International Carrot Conference in Mt Vernon, USA. Read more



EVA carrot partners presenting a poster at the International Carrot Conference in Mt. Vernon, USA.



ECPGR

# Communication

- Presenting EVA to potential stakeholders
- Interviews

## European Cooperative Programme for Plant Genetic Resources on a Successful Path

By European Seed Videos - November 24, 2022

195 0



Marcel Bruins, the editorial director for *European Seed*, sat down with Sandra Goritschnig, scientific officer at the European Cooperative Programme for Plant Genetic Resources (ECPGR) at the Euroseeds 2022 Congress to talk about the ECPGR and some of their successes.



# Benefits of EVA networks

- Access to unique international research and breeding network
- Access to genebank collections and unique materials
- Shared expertise and knowledge
- Joint work based on expertise and capacity
- Large phenotypic datasets from multilocation trials
- Joint analysis and dissemination of results
- Data embargo as incentive for private partners to contribute in-kind
- Results and materials will be publicly available (through EURISCO and SMTA)

All EVA networks are interested in continuing their collaborations, adjusting the work plans as necessary.

Closer collaboration with ECPGR WG desired.

Funding required for specific activities.

# Feedback from Networks

## EVA Wheat and barley

- Data analysis to focus on identification of resistance associated markers and interesting material for further work
- EVA 2.0 could work towards a pre-breeding approach introgressing landraces into elite cultivars for evaluations in an EVA 3.0 project
- Preparation phase for crosses takes several years
- Funding needed for population development, genotyping and meetings

## EVA Pepper:

- SME partners are happy to access genebank genetic diversity and see performance in different locations
- Pepper phenotyping is labour intensive, adjust future work plan according to capacity of partners
- Future work could focus on disease and abiotic stresses, exploring additional genetic diversity from other genebanks
- Funding needed for genotyping, lab trials, meetings



# Feedback from Networks

## EVA Maize

- Companies are interested in genetic diversity and agronomic performance of crosses
- Invite new genebanks to project to expand diversity
- Funding needed for multiplication, genotyping and meetings
- Collaboration with ERA-net project MineLandDiv

## EVA Lettuce:

- Fruitful collaboration, continue at pre-competitive level
- Future work to increase sample number for GWAS on traits with high heritability
- Funding needed for genotyping, lab trials and meetings

## EVA Carrot:

- All partners appreciate collaboration and wish to continue
- Labour-intensive field evaluations need funding for public partners, private partners contribute in kind
- Future work to build on experience in this project and focus on disease traits and additional material
- Funding needed for genotyping, some trials, regeneration and meetings



# Expansion of EVA networks

**EVA Legumes** is in preparation through Grain Legumes WG activity **ForEVA**

- 20 Genebank partners (WG)
- 7 Stakeholders

Meeting in October:

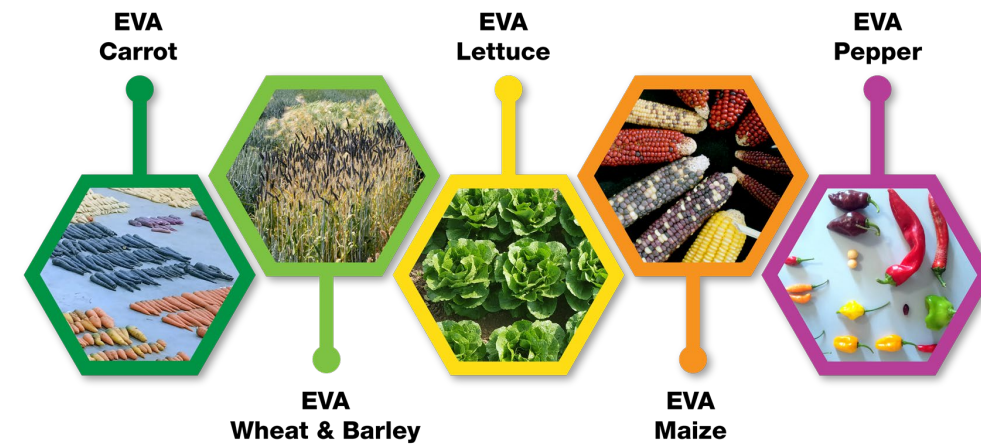
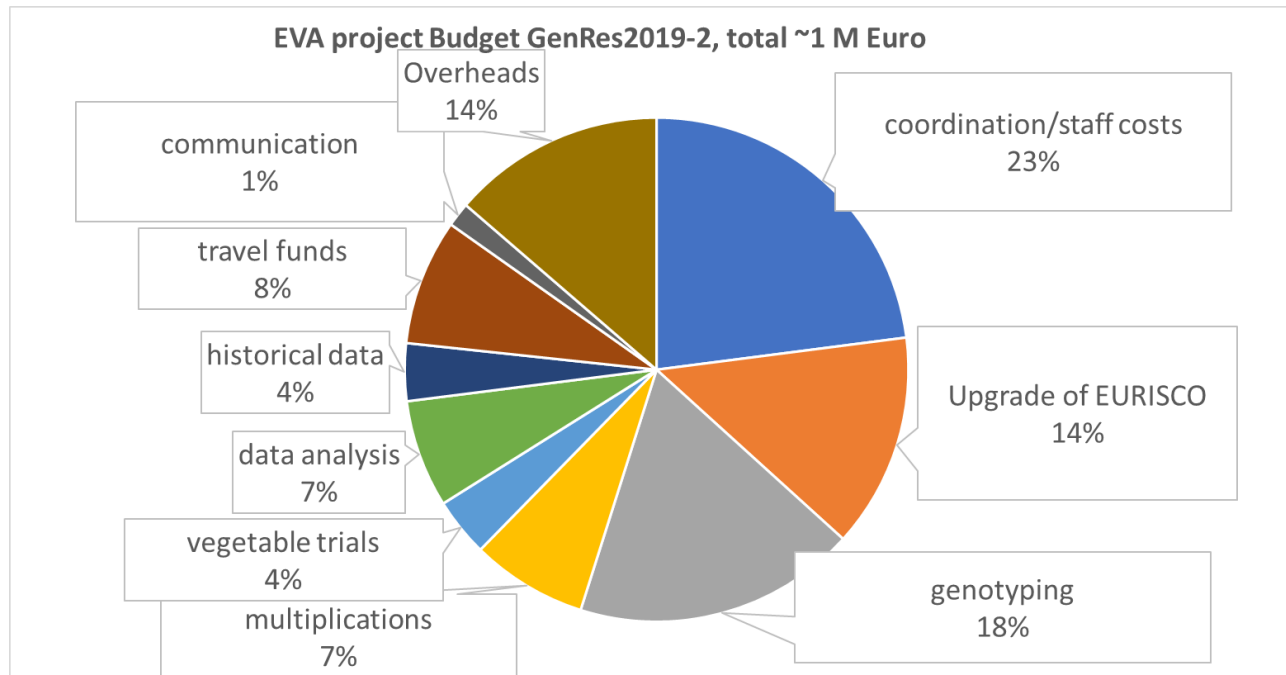
- Design work plan
- Identify funding
- Formalize EVA Legumes Network





# Funding sources for EVA

**Project funding by Germany (2019-2024): ~1M € for**



**Partners contribute in-kind to**

- Multiplications
- Evaluations
- Analysis
- Dissemination + exploitation
- Travel to project meetings (private partners)

**Additional project funding through EU project AGENT**

**~250k € for:**



Multiplication of 3<sup>rd</sup> Set of accessions for EVA Wheat and Barley (2023-2024)  
Expansion of stakeholders to on-farm evaluations by organic network  
Contribution to EVA coordination (ECPGR staff costs)



# Financial sustainability for EVA

## ECPGR support for EVA (see budget proposal for Phase XI)

- Coordination of networks
- Budget management
- Permanent database infrastructure (EURISCO)
- Meetings organization

## In-kind contributions by private and public partners

- Phenotypic evaluations (field trials)
- Regenerations/multiplications
- Data analysis

## Funding needed for specific network activities:

- Genotyping
- Public partners' activities
- Specific experiments (requiring lab space, special equipment)
- Data analysis
- Project meetings



# EVA networks and European projects



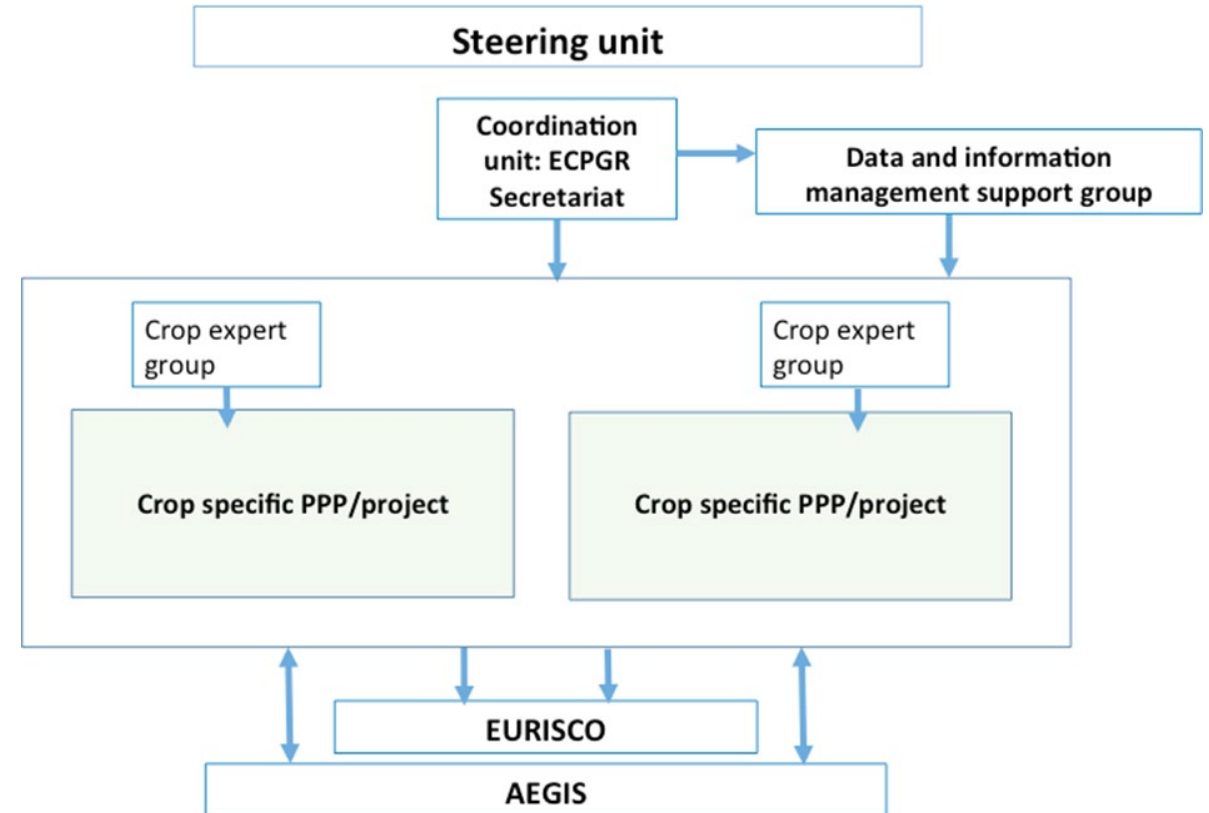
EURO CWR

- PGR infrastructure to benefit **EVA networks** → access to materials and services, no funding
- Some **EVA Maize** partners participate in ERAnet project **MineLandDiv** (2023-2026), coordinated by INRAE. Cooperation on genotyping and phenotyping of maize collection builds on EVA results. Co-funding available for some EVA activities
- **EVA Carrot** and **Lettuce** propose work on wild relatives within Euro CWR project proposal (2024-2027). Funding requested for some EVA partners' activities

# EVA Steering Committee

**Structure of EVA will be composed of the following permanent Units:**

- A Steering Unit of no more than 8 experts appointed by the Steering Committee of ECGPR in consultation with the private sector, which will provide overall policy guidance for EVA → **to be appointed?**
- A Coordination unit provided by the Secretariat of ECPGR → **EVA coordinator + Admin support**
- A data and information management support group appointed by the Steering Unit → **EURISCO + EVA coordinator, developer, input from networks**



# Acknowledgements

Funding:



Federal Ministry  
of Food  
and Agriculture



The AGENT project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862613.

EVA network partners:





**THANK YOU**