European Cooperative Programme for Plant Genetic Resources
ECP/GR

EVA
European Evaluation Network

EVA LETTUCE – NETWORK BACKGROUND, AND PROGRESS UPDATE

S. Goritschnig

ECPGR

Leafy Vegetables WG and EVA Lettuce meeting
Skierniewice, 8 October 2026





Agenda:

- Review of EVA framework
- General update on EVA networks
- Review activities EVA Lettuce
  - *Lactuca sativa*
  - *Lactuca serriola*
  - Genotyping
- Communication and dissemination
- Work planning for EVA 2.0
  - Recap on ideas for collaborative projects and proposals
  - Discussion with WG on future work

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European Evaluation Network for PGRFA aims to:

EVA

European Evaluation Network

https://www.ecpgr.org/eva

Since 2019

- Promote the **use of germplasm diversity** held in European genebanks in research, breeding and cultivation
- Promote exchange of PGR material with **SMTA**
- Foster cooperation between **public and private** sector, involving wider groups of stakeholders in using PGRFA
- Generate **standardized** multilocation evaluation data to identify **promising breeding materials** adapted to local conditions
- Increase **knowledge**, improve passport information and add C&E data in **EURISCO**
- Create **self-sustaining networks** that evaluate available PGRFA in continuous evaluation cycles

European Cooperative Programme for Plant Genetic Resources ECP/GR

Federal Ministry of Agriculture, Food and Regional Identity

AGENT

Euroseeds Embracing Nature

ECP/GR

EVA timeline across ECPGR phases

Phase IX

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

Phase X

- EVA project (BMEL) (2019–2025): **Implementation of five EVA** networks
- H2020 project **AGENT** extends activities of EVA Wheat and Barley to 2025
- **ForEVA** Grant scheme activity develops **EVA Grain Legumes Network**

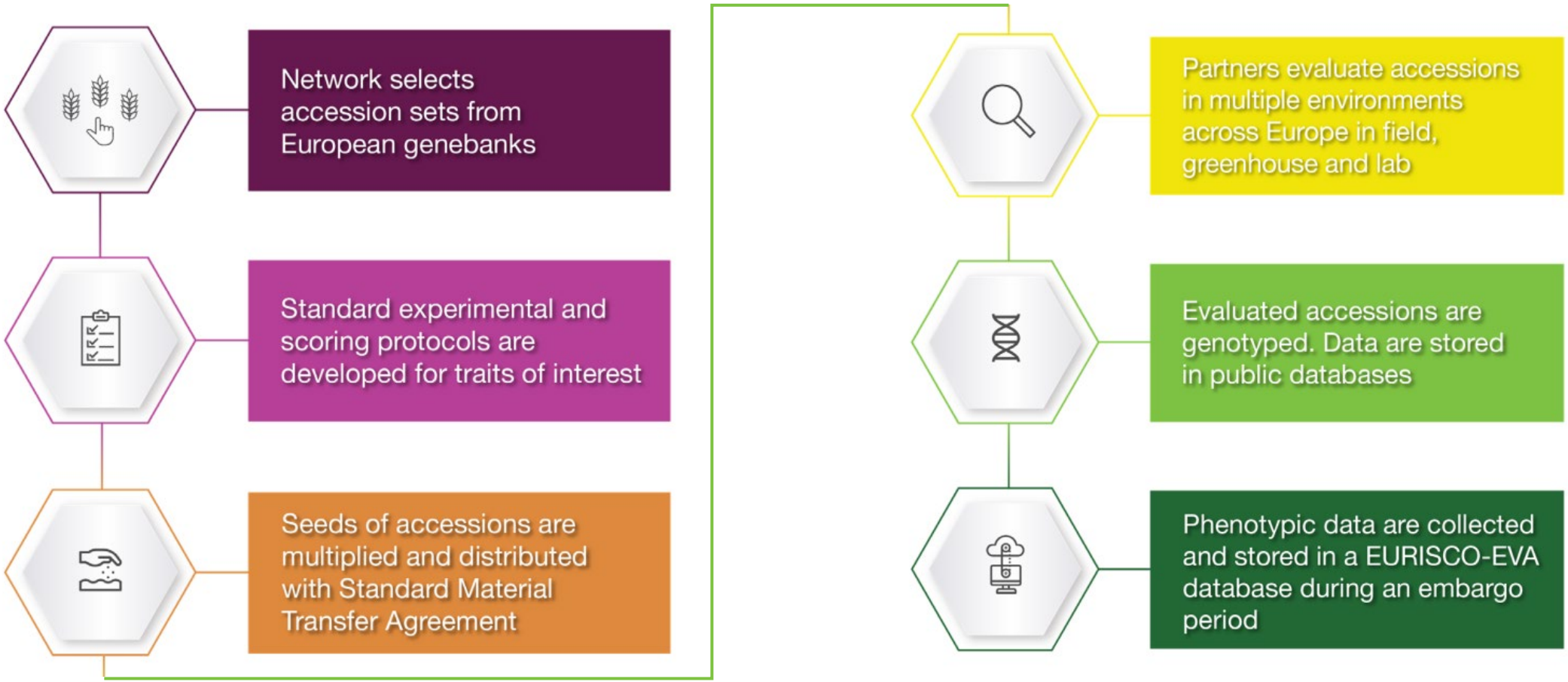
Phase XI

- EVA Boost project (BMLEH) approved for 2024–2027
  - **EVA Legumes** networks implementation
  - Development of Roadmap for **EVA Perennials** network implementation
- Grant scheme activities support continued collaboration of EVA Networks:
  - EVA Pepper – **EuroPepLand**
  - EVA Maize – **MALANIRS**
  - EVA Wheat and Barley – **ValoResWB**
- Horizon project **GENIUS** will support implementation of EVA Perennials for Nut species

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How EVA networks operate



Cooperation agreement ensures privileged access to data, while material is exchanged through SMTA and can be used for further development and eventual commercial use

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EURISCO-EVA data management

EURISCO-EVA Intranet

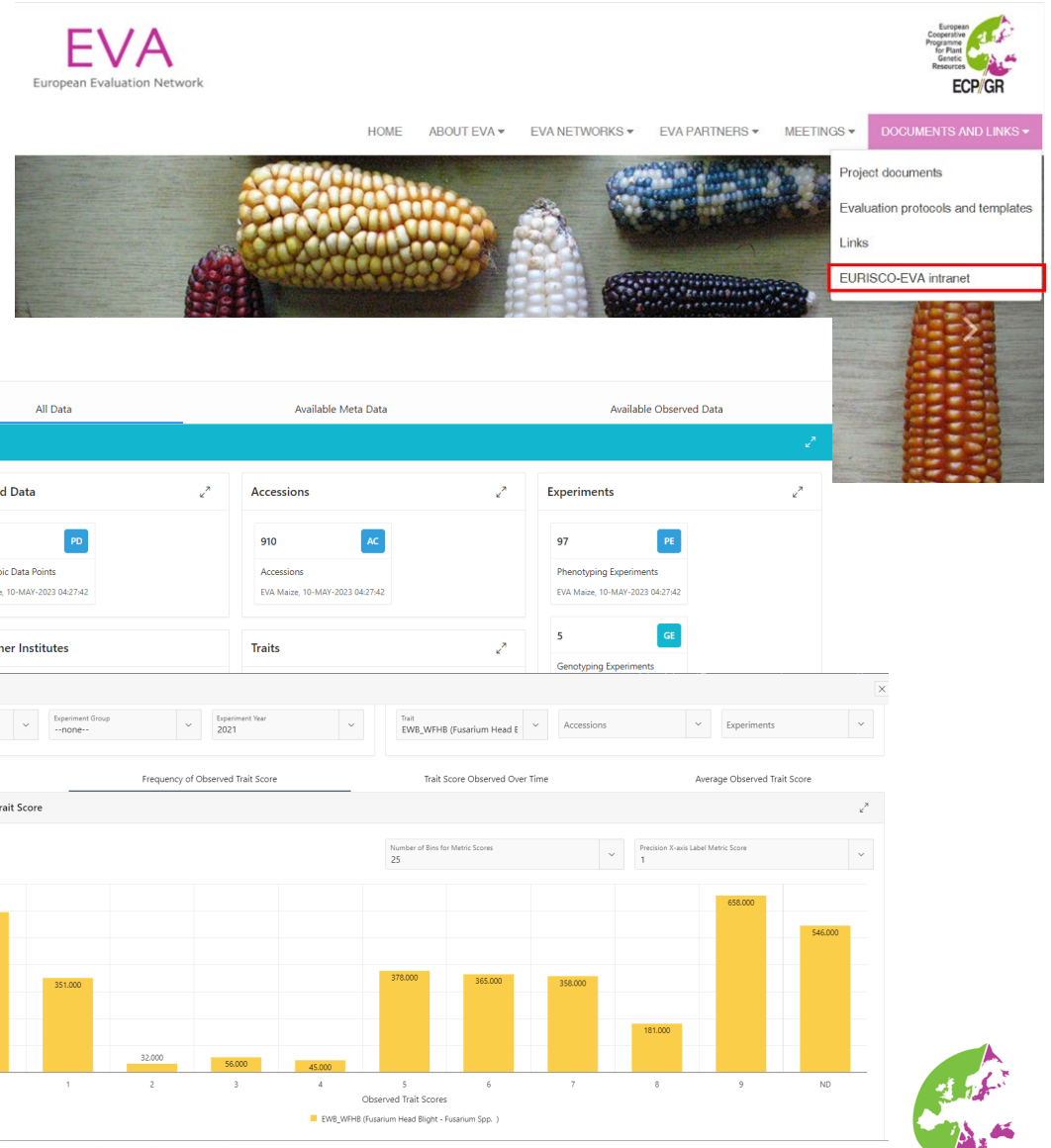
- EURISCO backbone
  used also by Horizon projects AGENT and INCREASE
- Information system for multilocation phenotypic data

Standard protocols

- Comparable data from multilocation trials

Standard data templates

- Facilitate FAIR data

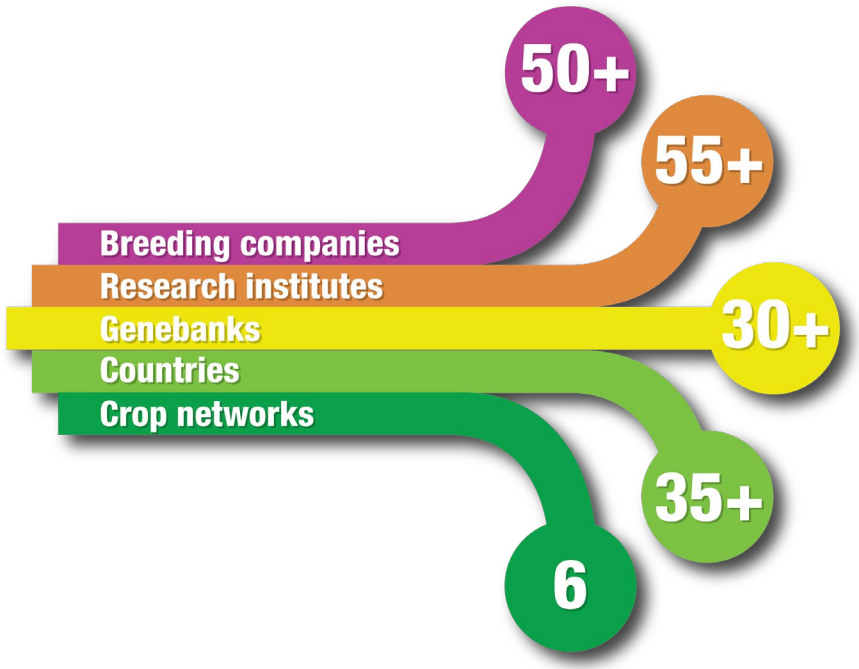


Current status of EVA networks

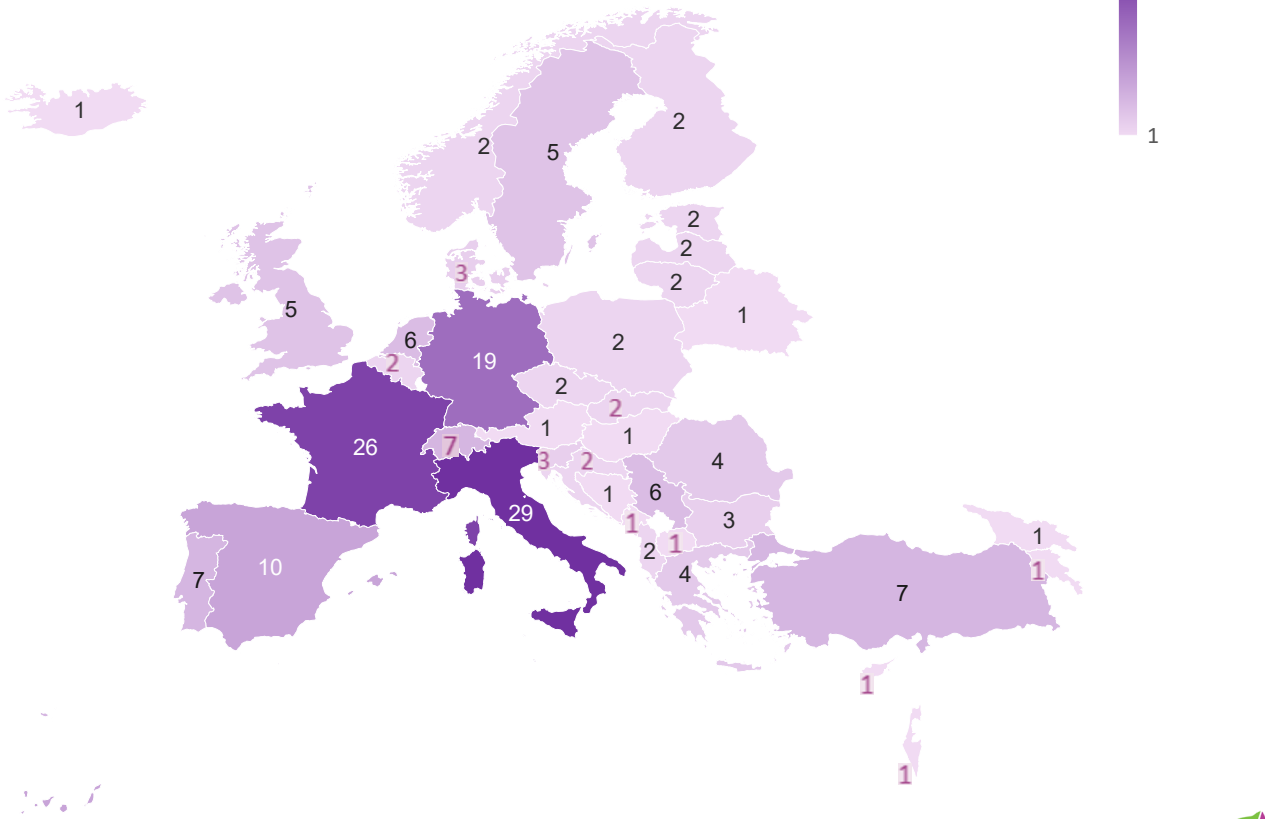


Collaborative crop-specific Public–Private Partnerships

www.ecpgr.org/eva



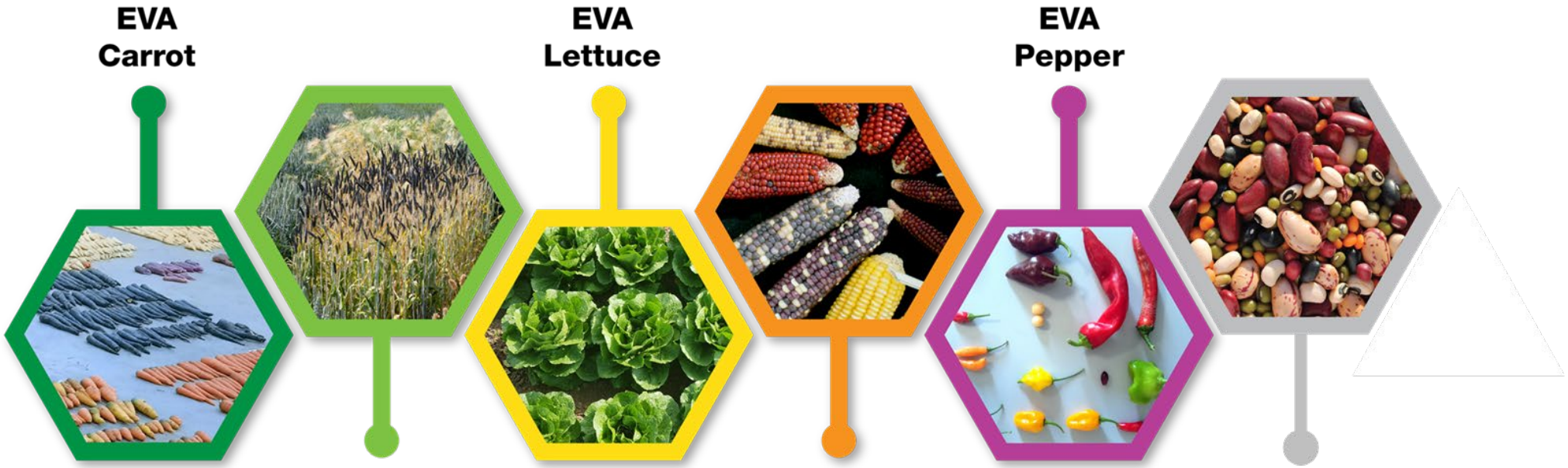
131 partners from 38 countries across Europe



Includes also organizations participating in multiple EVA Networks

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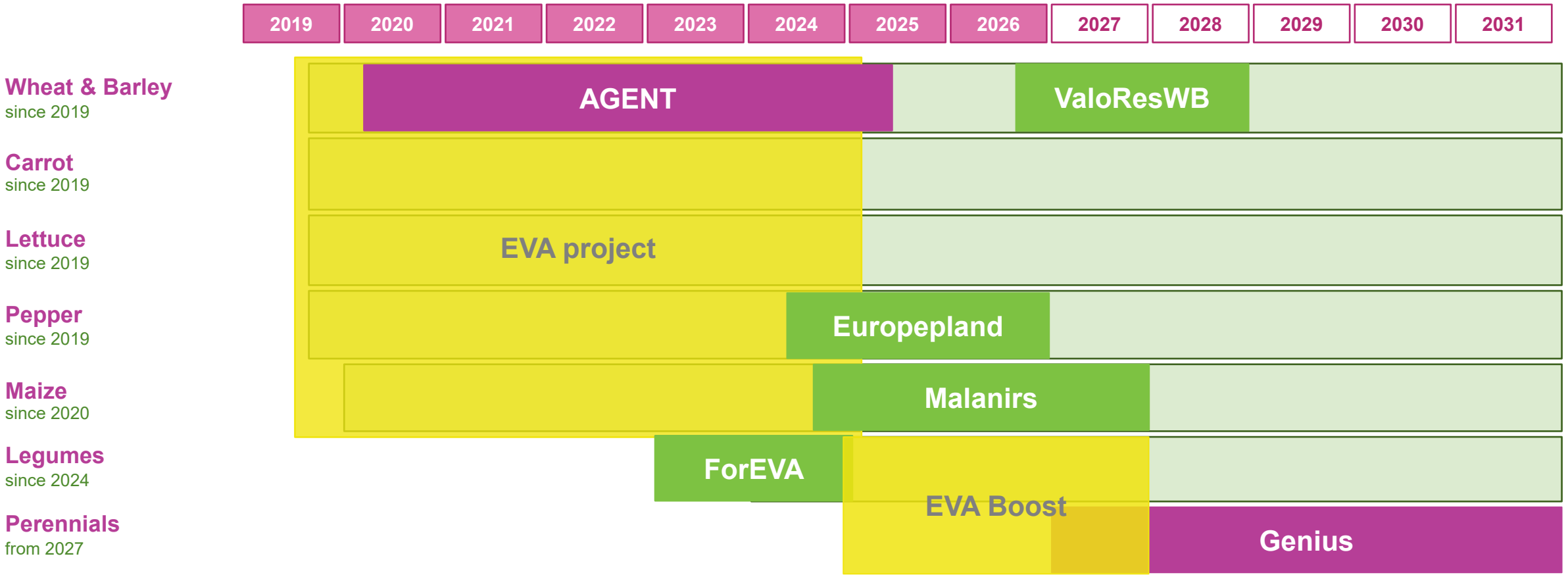
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	All Networks	EVA Carrot	EVA Wheat Barley	EVA Lettuce	EVA Maize	EVA Pepper	EVA Legumes
Partner Institutes	131	18	47	10	24	25	54
Countries	38	9	20	8	13	16	25
Public sector partners	74	9	21	6	16	20	43
Private sector partners	57	9	26	4	8	5	11

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EVA network project funding timeline



German-funded (BMLEH)	~1.5M €
EU-funded projects	~0.5M €
ECPGR grant projects	~135k €
EVA network active	

EVA networks rely on in-kind contributions and co-funding of all partners!

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EVA Projects funded by Germany

Federal Ministry of Agriculture, Food and Regional Identity

EVA

2019–2025 €1,053,275

- Implementation of EVA network on wheat, barley, vegetable crops and maize (EVA) (GenR 2019-2)

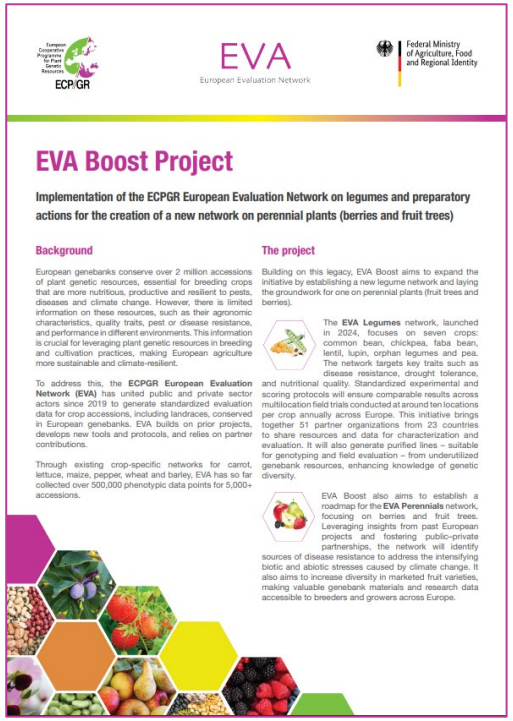


https://www.ecpgr.org/resources/ecpgr-publications/publication/eva-2019-2025-final-report-2026

EVA Boost

2024–2027 €353,740

- Implementation of the ECPGR European Evaluation Network (EVA) on legumes and preparatory actions for the creation of a new network on perennial plants (berries and fruit trees) – EVA Boost (GenR 2024-2)



https://www.ecpgr.org/fileadmin/bioversity/publications/pdfs/EVA_Boost_factsheet.pdf

ECP/GR

Scientific publications

Position paper



Goritschnig, S., Weise, S., Guzzon, F., Maggioni, L., van Hintum, T., Steffensen, L. L., Stein, N. and Giuliano, G. (2025) **Strengthening European research cooperation on plant genetic resources conservation and use**, *Genetic Resources*, (S2), pp. 119–134. doi: https://doi.org/10.46265/genresj.LUZJ7324.

EURISCO-EVA



Kumar, S., Guzzon, F., Goritschnig, S. and Weise, S. (2024) **The EURISCO-EVA Information System, an innovative approach to the data management of multi-site crop evaluation data**, *Genetic Resources*, 5(10), pp. 117–125, doi: https://doi.org/10.46265/genresj.IHXU5248

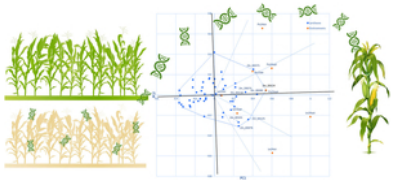
Read the **blog**

EVA Maize



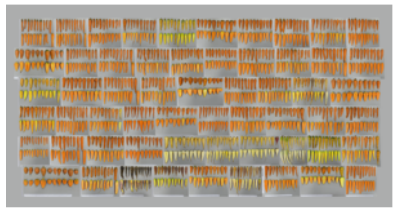
Balconi C, Galaretto A, Malvar RA, Nicolas SD, Redaelli R, Andjelkovic V, Revilla P, Bauland C, Gouesnard B, Butron A, et al. **Genetic and Phenotypic Evaluation of European Maize Landraces as a Tool for Conservation and Valorization of Agrobiodiversity**. *Biology*. 2024; 13(6):454. DOI: https://doi.org/10.3390/biology13060454

Read the **blog**



Santiago R, R.A. Malvar, P. Revilla, A. Butrón (2025) **Maize landraces as useful donors of genetic diversity for resilience to drought**, *Journal of Agriculture and Food Research*, Volume 23, https://doi.org/10.1016/j.jafr.2025.102297

EVA Carrot



Phenotypic diversity of 60 accessions evaluated in EVA Carrot in 2020-2021. Credit: E. Geoffriau

Goritschnig, S., Pagan, P., Mallor, C., Thabuis, A., Chevalier, J., Hägnefelt, A., Bertolin, N., Salgon, S., Groenewegen, M., Ingremeau, A., Santillan Martinez, M., Lehnert, H., Keilwagen, J., Burges, T., Budahn, H., Nothnagel, T., Lopes, V., Allender, C., Huet, S. and Geoffriau, E. (2023). **Exploring European carrot diversity through public-private partnerships in EVA Carrot.** *Acta Hortic.* 1384, 63-70. DOI:https://doi.org/10.17660/ActaHortic.2023.1384.8

Read the **blog**

EVA Lettuce



Photo: C. Aichholz and T. Zollinger

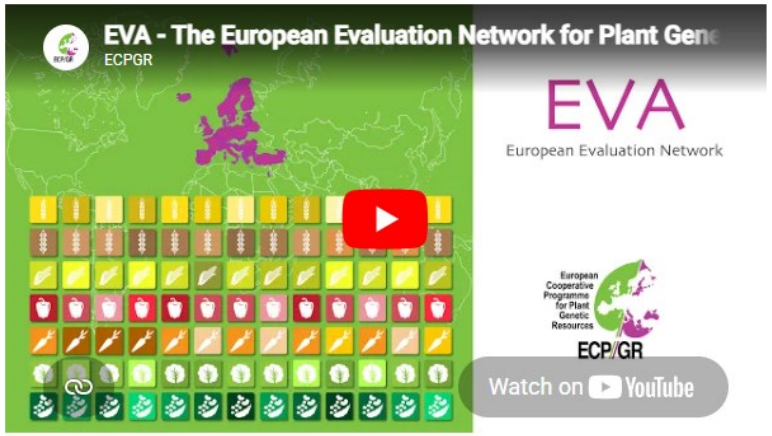
Tripodi P, Beretta M, Peltier D, Kalfas I, Vasilikiotis C, Laidet A, Briand G, Aichholz C, Zollinger T, Treuren Rv, Scaglione D and Goritschnig S (2023) **Development and application of Single Primer Enrichment Technology (SPET) SNP assay for population genomics analysis and candidate gene discovery in lettuce**. *Front. Plant Sci.* 14:1252777. doi: 10.3389/fpls.2023.1252777

Read the **press release**

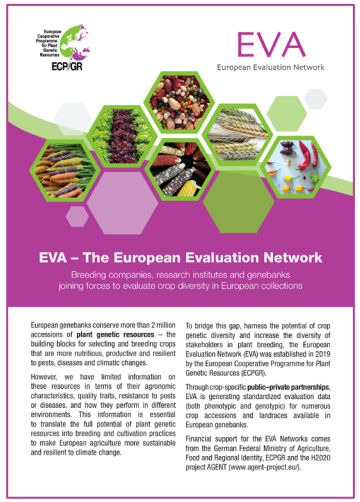
https://www.ecpgr.org/eva/documents-and-links/publications

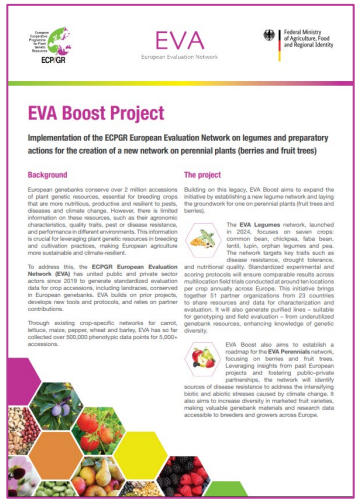
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Communications and outreach



https://bit.ly/EVA-PGR









https://bit.ly/SPET-lettuce



https://encyclopedia.pub/video/1816

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Challenges and priorities

Data curation, management and analysis:

- Variable quality of datasets despite standardization challenge analysis
- Need for centralized data and metadata curation
- Update intranet database and connect with EURISCO
- Create a public data portal (as in AGENT)

Resource mobilization and outreach:

- Base funding for activities is needed (multiplication, specific experiments, meetings)
- Enhance collaboration with relevant EU projects as stakeholders for results exploitation
- New project proposals require an available coordinator, novelty and expected outcomes of the call need to be compatible with the EVA objectives

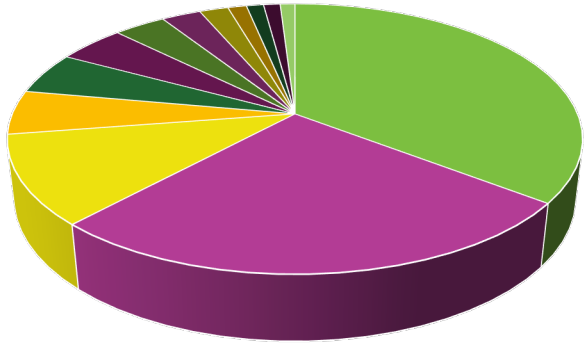
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Data output of EVA networks (2020–2025)

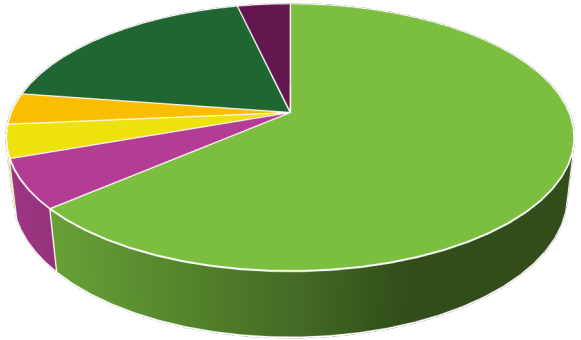
EVA
European Evaluation Network

5,742 accessions



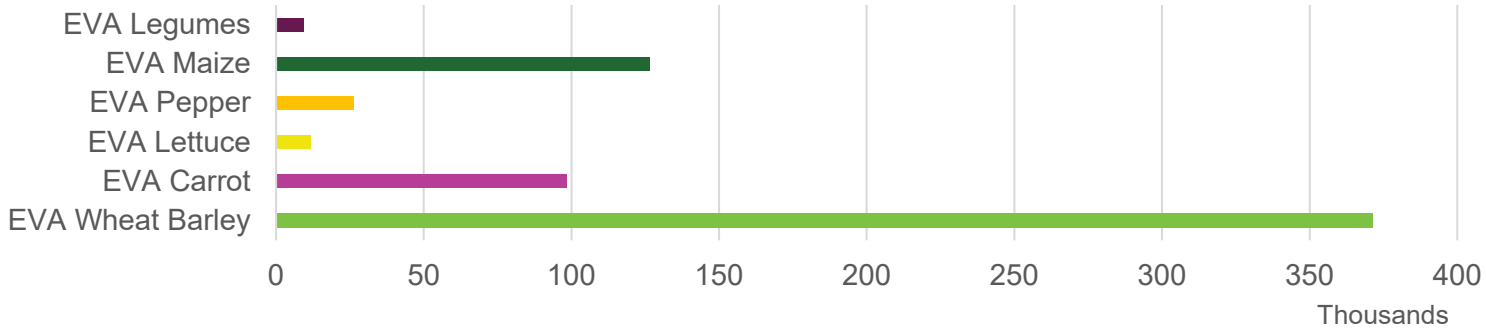
Triticum Hordeum Zea Lactuca Phaseolus
Capsicum Cicer Lens Daucus Lupinus
Pisum Vigna Vicia

473 Trials



EVA Wheat Barley EVA Carrot EVA Lettuce
EVA Pepper EVA Maize EVA Legumes

643,482 datapoints



Data as of 06/05/2026

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EVA Lettuce

Review and update



EVA Lettuce network partners





GAUTIER semences

sativa

AMERICAN FARM SCHOOL
Thessaloniki · Greece

NordGen

crea
Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

Panora

Limagrain
from earth to life

WAGENINGEN
UNIVERSITY & RESEARCH

INRAE

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EVA Lettuce collection

	L. sativa				*L. Serriola*	*AEGIS accessions*
genebank	iceberg	butterhead	others	total		
CGN	2	26	8		9	16
BGR	53	2	19		6	0
INRAE	0	34	32		36	0
NordGen	0	2	0		74	55
total	55	64	59	178	125	71
SSD Multiplied/ genotyped	46	55	54	155	99	
phase 2 SSDs	22	33	6	61		

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EVA – Lettuce network workplan – *L.sativa*

2020 | 2021 | 2022 | 2023 | 2024

Phase 1

- All accessions
- Limited traits and replicates
- 3 sites

Full set:
178 accessions,
different types

SSD Subset

Phase 2

- Larger plots
- Include also quality traits
- More plants and sites

Subset Phase 2:
61 accessions
Iceberg, butterhead and
3 controls


ORIGINAL RESEARCH article

Front. Plant Sci., 18 August 2023
Sec. Plant Bioinformatics
Volume 14 - 2023 | https://doi.org/10.3389/fpls.2023.1252777

This article is part of the Research Topic
Advances on Genomics and Genetics of Horticultural Crops and their Contribution to Breeding Efforts - Volume II
View all 6 Articles

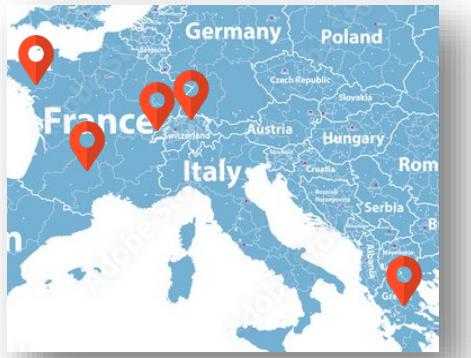
Development and application of Single Primer Enrichment Technology (SPET) SNP assay for population genomics analysis and candidate gene discovery in lettuce

Pasquale Tripodi[1*] Massimiliano Beretta[2] Damien Peltier[3] Ilias Kalfas[4] Christos Vasilikiotis[5] Anthony Laidet[6] Gael Briand[6] Charlotte Aichholz[7] Tizian Zollinger[8] Rob van Treuren[9] Davide Scaglione[10] Sandra Goritschnig[11*]

Data Analysis and publication

Genotyping

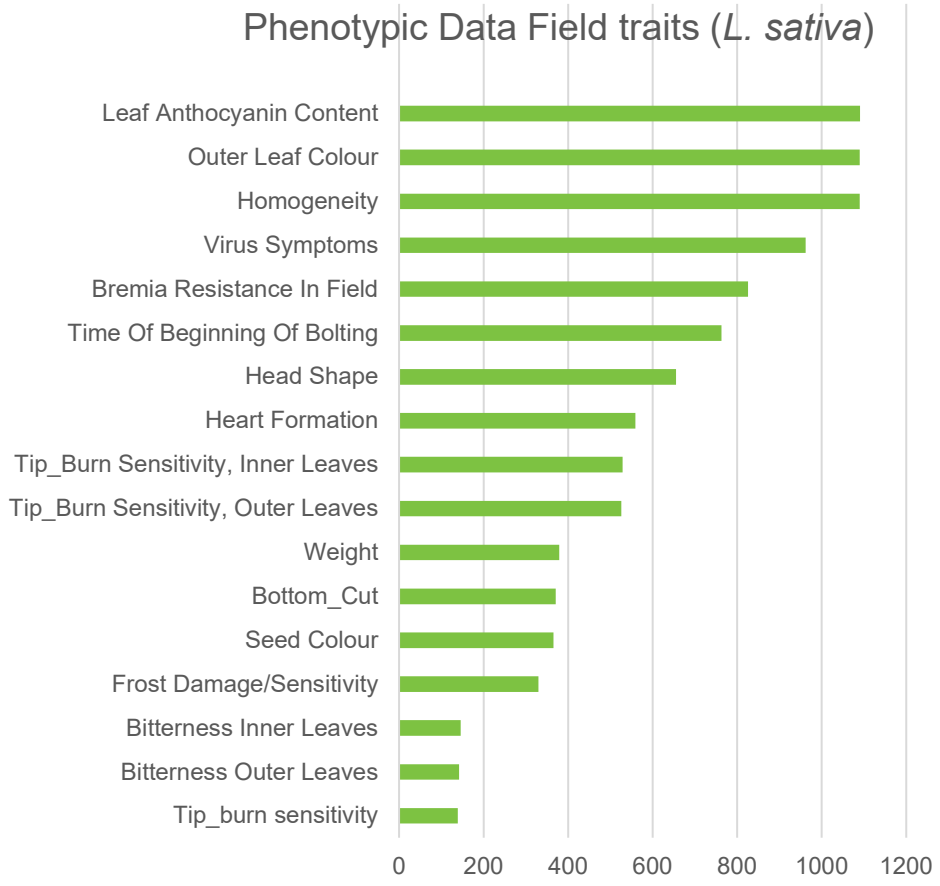
- Development of SPET genotyping assay for lettuce
- 155 *L. sativa* accessions genotyped



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EVA Lettuce data in EURISCO-EVA

	accessions	# data points	
		min	max
L. sativa phase 1	178	7	31
L sativa-SSD	61	88	109



https://eva.ipk-gatersleben.de/

- SNP viewer based on SPET data implemented



- Photos for 87 accessions included



Trial ID:EVA-Ls-ZLS-2020A, Accession: EVA_lsa_052, Zollinger, Les Evouettes, Switzerland

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Results exploitation from the EVA Lettuce *L. sativa* field trials

ORIGINAL RESEARCH article

Front. Plant Sci., 18 August 2023
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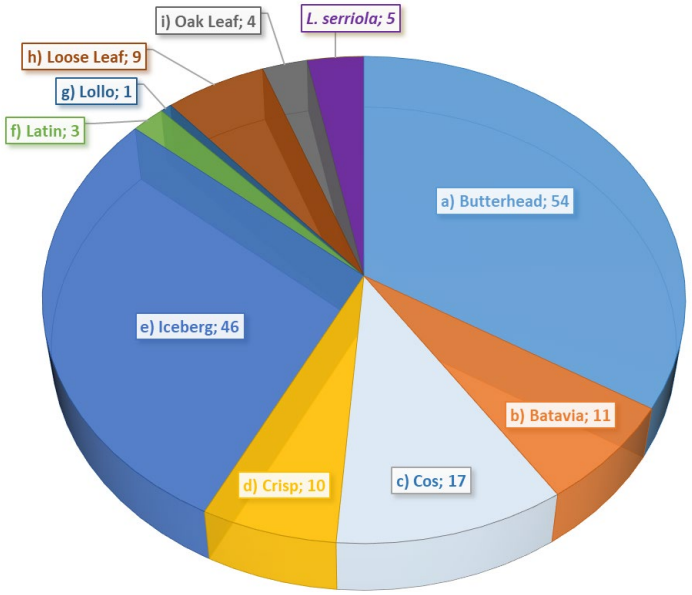
[1] Council for Agricultural Research and Economics (CREA), Research Centre for Vegetable and Ornamental Crops, Pontecagnano Faiano, SA, Italy
[2] ISI Sementi SpA, Fidenza (PR), Italy
[3] Limagrain - Vilmorin-Mikado, La Ménitré, France
[4] American Farm School, Thessaloniki, Greece
[5] Perrotis College, American Farm School, Thessaloniki, Greece
[6] Gautier Semences Route d'Avignon 13630, Eyragues, France
[7] Sativa Rheinau AG, Rheinau, Switzerland
[8] Zollinger Conseilles Sarl, Les Evouettes, Switzerland
[9] Centre for Genetic Resources, the Netherlands (CGN), Wageningen University and Research, Wageningen, Netherlands
[10] IGA Technology Services Srl, Udine, Italy
[11] European Cooperative Programme for Plant Genetic Resources (ECPGR) Secretariat c/o Alliance of Bioversity International and CIAT, Rome, Italy

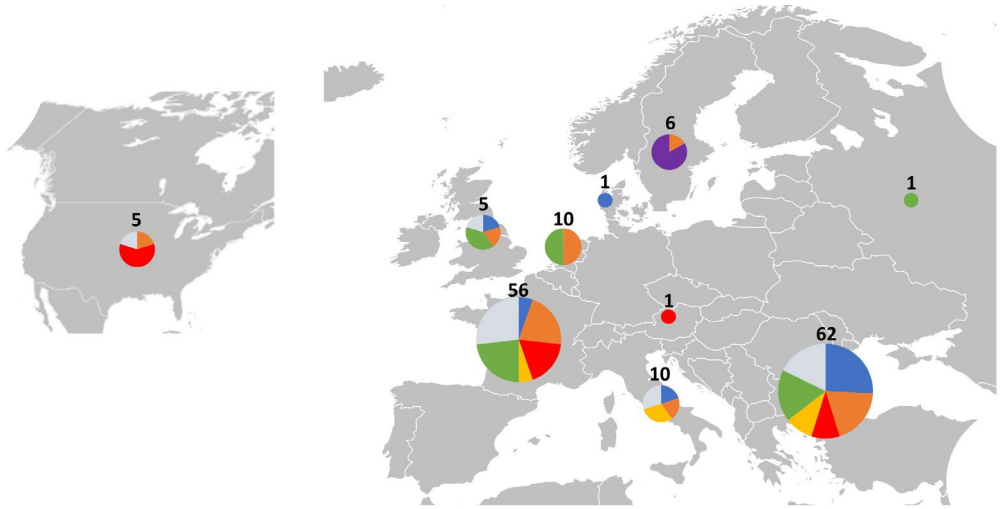


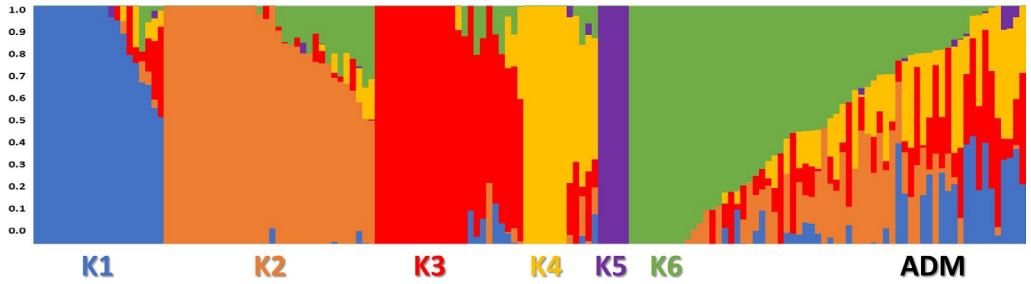
https://bit.ly/SPET-lettuce

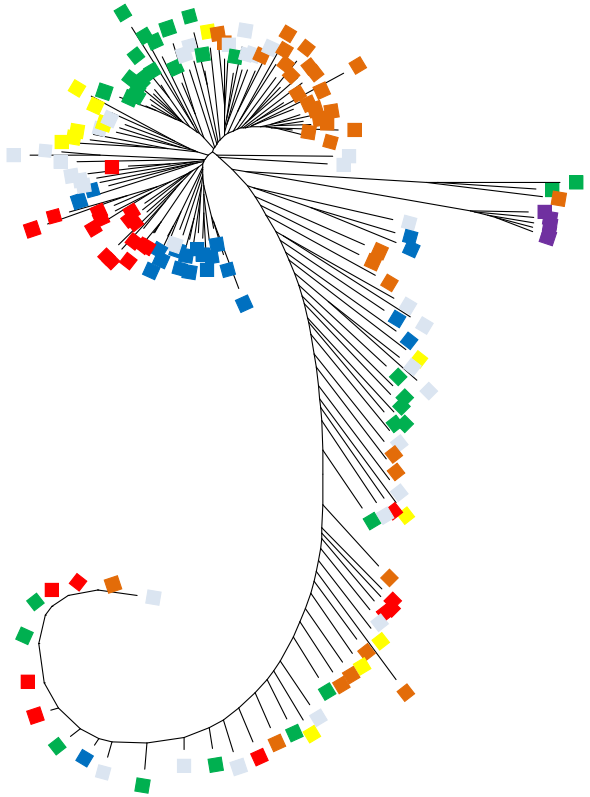
Genetic structure of EVA Lettuce collection

160 genotyped accs. (155 L. sativa, 5 L. serriola)







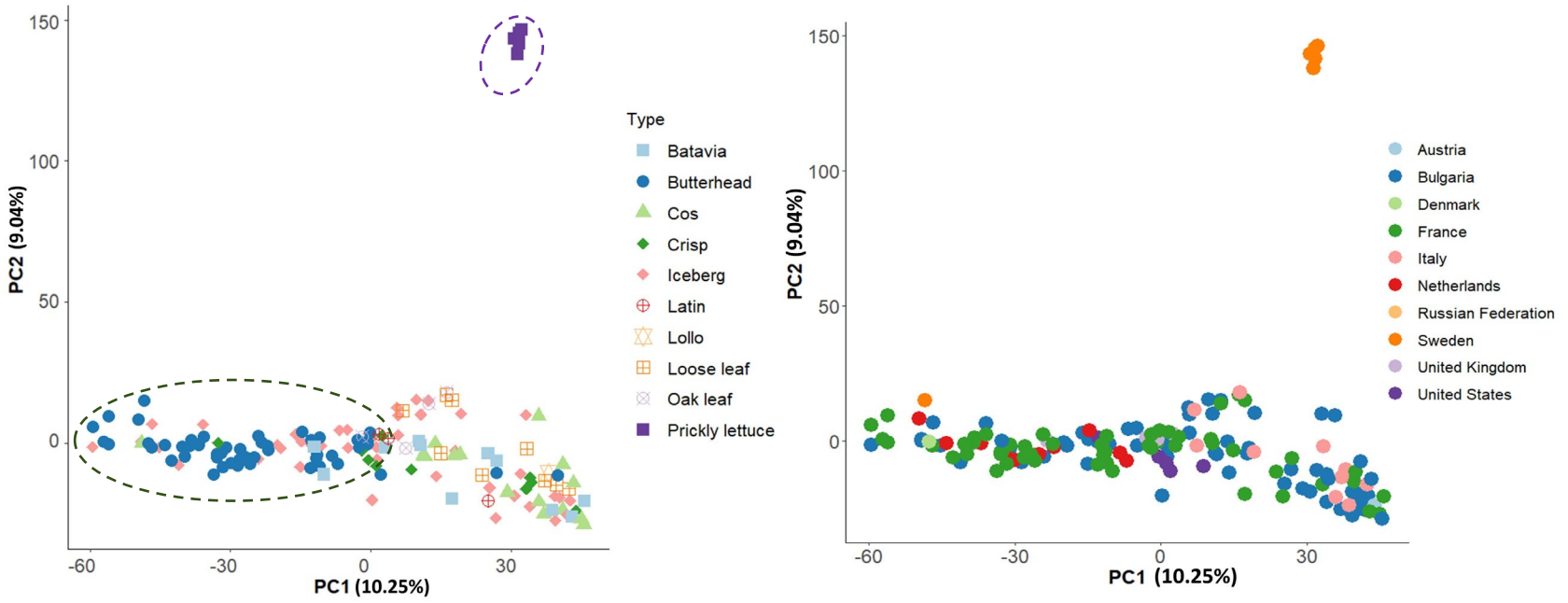


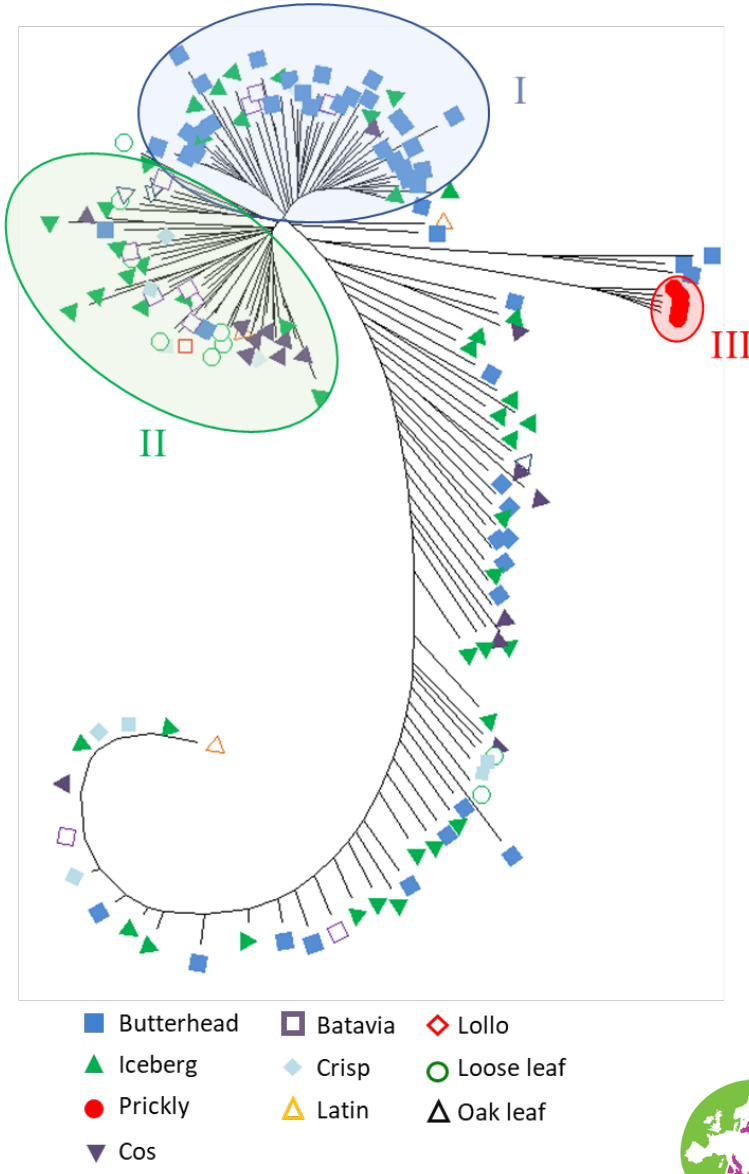
K1 - Iceberg & Landraces
K2 - Most butterhead
K3 - Iceberg & batavia
K4 - Iceberg/oak/loose leaf
K5 - L. serriola
K6 -Most butterhead & some iceberg

Tripodi et al, https://doi.org/10.3389/fpls.2023.1252777

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Principal component analysis



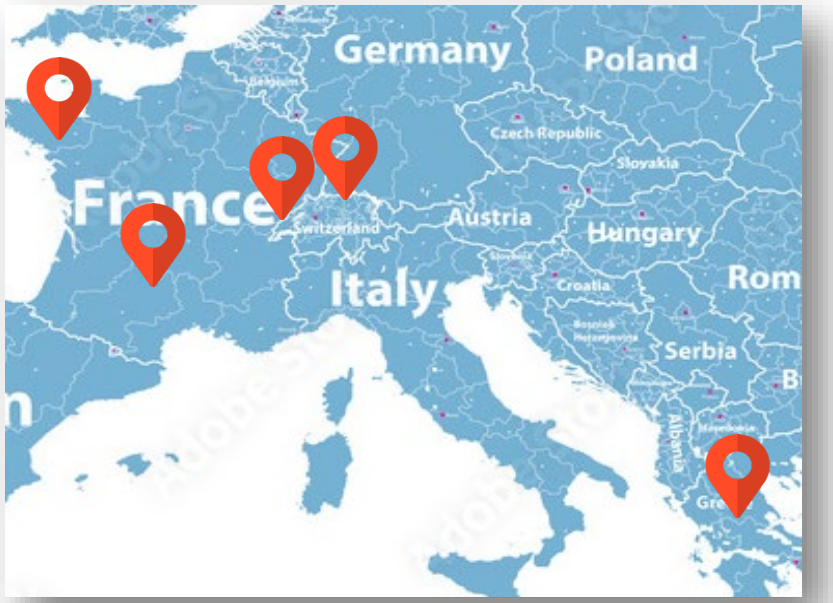


Clustering of Lettuce according to typology rather than geographic origin

Tripodi et al, https://doi.org/10.3389/fpls.2023.1252777

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Field trials



- 155 *L. sativa* accessions
- 5 Trial locations
- 2 years (2021-2022)

Seed colour



Leaf colour traits



Bolting time









Genome wide association analysis

6 Models:

GLM

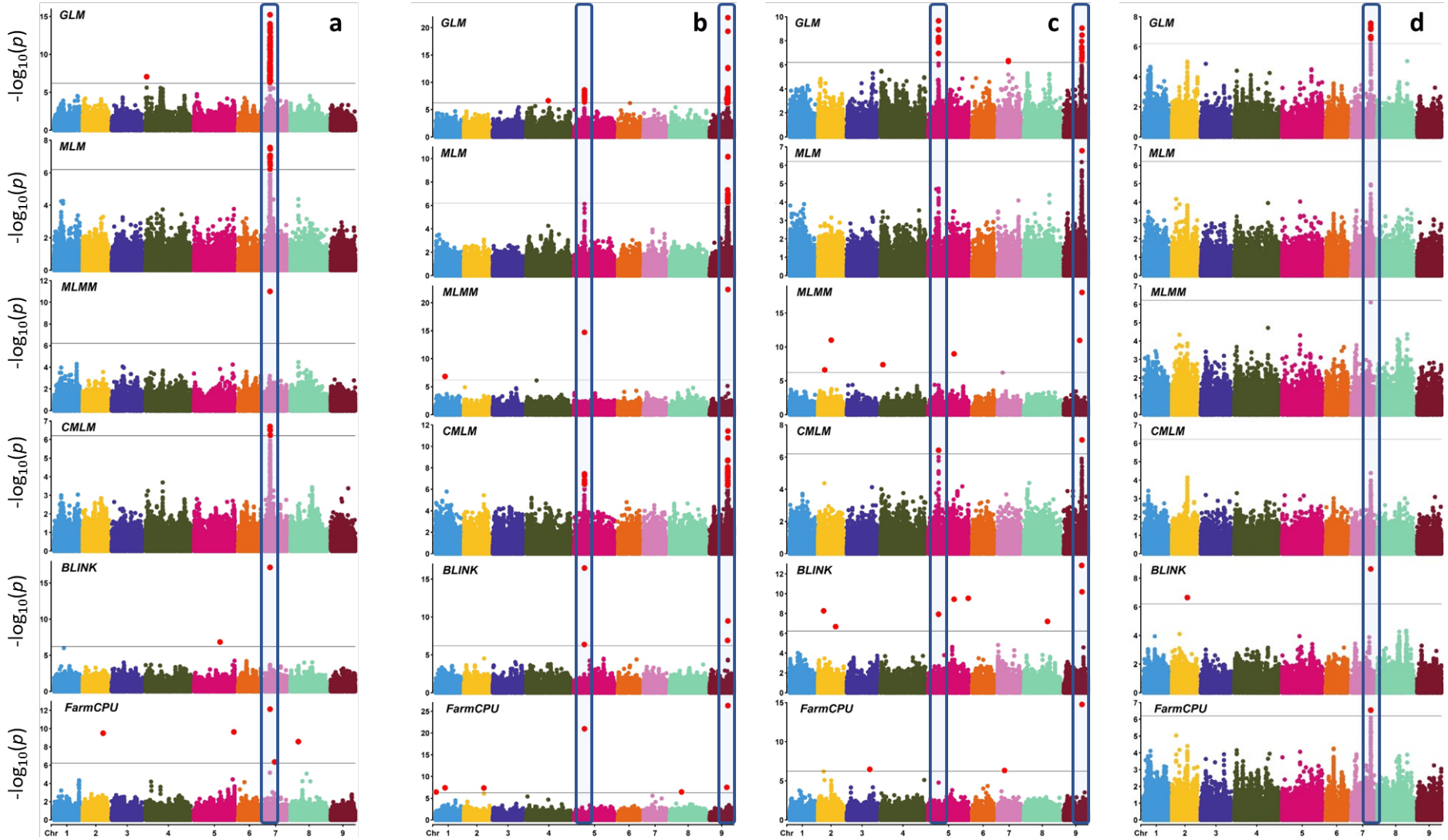
MLM

MLMM

CMLM

BLINK

FarmCPU



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Candidate genes identification

Trait	Chromosome	Model*	Position^	Major/Minor Allele	MAF+	Minor Allele Effect	PVE#	Nearest candidate gene	Candidate gene annotation
Seed colour	7	a,b,c,e, f	50,400,650	C/T	0.25	0.48 - 0.80	0.03 - 45.26	+19.55 kb	*Atp-dependent rna helicase DEAH5*
	7	d	50,547,653	G/T	0.28	3.33 e-08	0.73	0.0 kb	*Cytokinin dehydrogenase 3*
Leaf Anthocyanin Content	5	a,c,d,e,f	86,123,750	T/A	0.27	0.30 - 0.55	4.55 - 15.26	0.0 kb	*Phototropin-2*
	9	a,b,c,d,e,f	152,909,707	G/A	0.22	-1.12 - -0.5	3.99 - 23.70	0.0 kb	*MLO like protein 11*
Outer Leaf Colour	5	a,d,f	86,150,826	T/A	0.21	0.10 - 0.30	2.78 - 20.32	0.0 kb	*Signal peptidase complex subunit 3B*
	9	a,b,c,d,e,f	152,883,490	A/G	0.26	0.45 - 0.70	10.46 -47.65	0.0 kb	*General transcription factor 3C polypeptide 6*
Bolting time	7	a,e,f	164,434,052	A/G	0.49	-1.67 - -1.47	18.71 - 48.65	-1.77 kb	*FAR1-related sequence 10*

Confirmed previous findings

Detected novel candidates

- The 40K SPET lettuce panel enriches genotyping tools available in lettuce
- By covering almost the entire gene space it is highly recommended for genome wide association studies

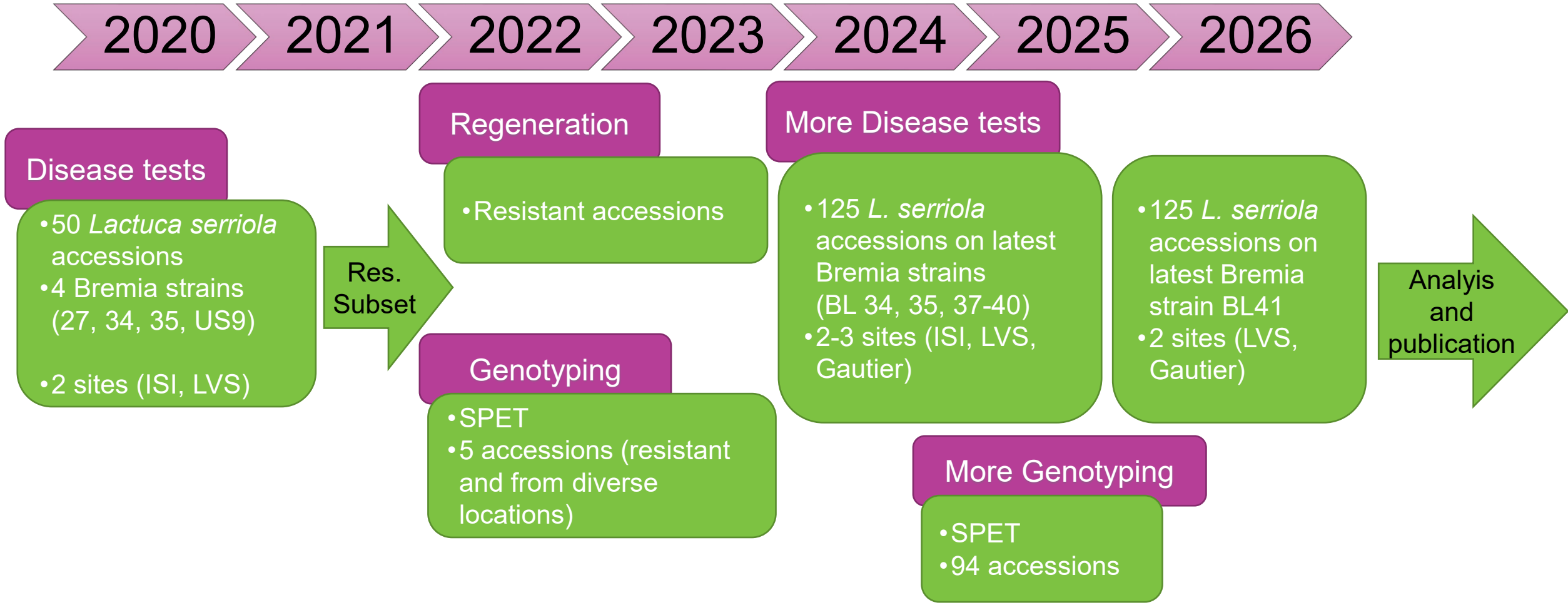
➢ Further investigations in larger crop collection and accessions from the different genepools

➢ Investigation of candidate genes for additional traits of interest (e.g. resistances)

Tripodi et al, https://doi.org/10.3389/fpls.2023.1252777

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EVA – Lettuce network workplan – *L. serriola*



Pasquale Tripodi will update on analysis progress

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EVA Lettuce future projects and collaboration with WG





EVA Lettuce proposals and priorities

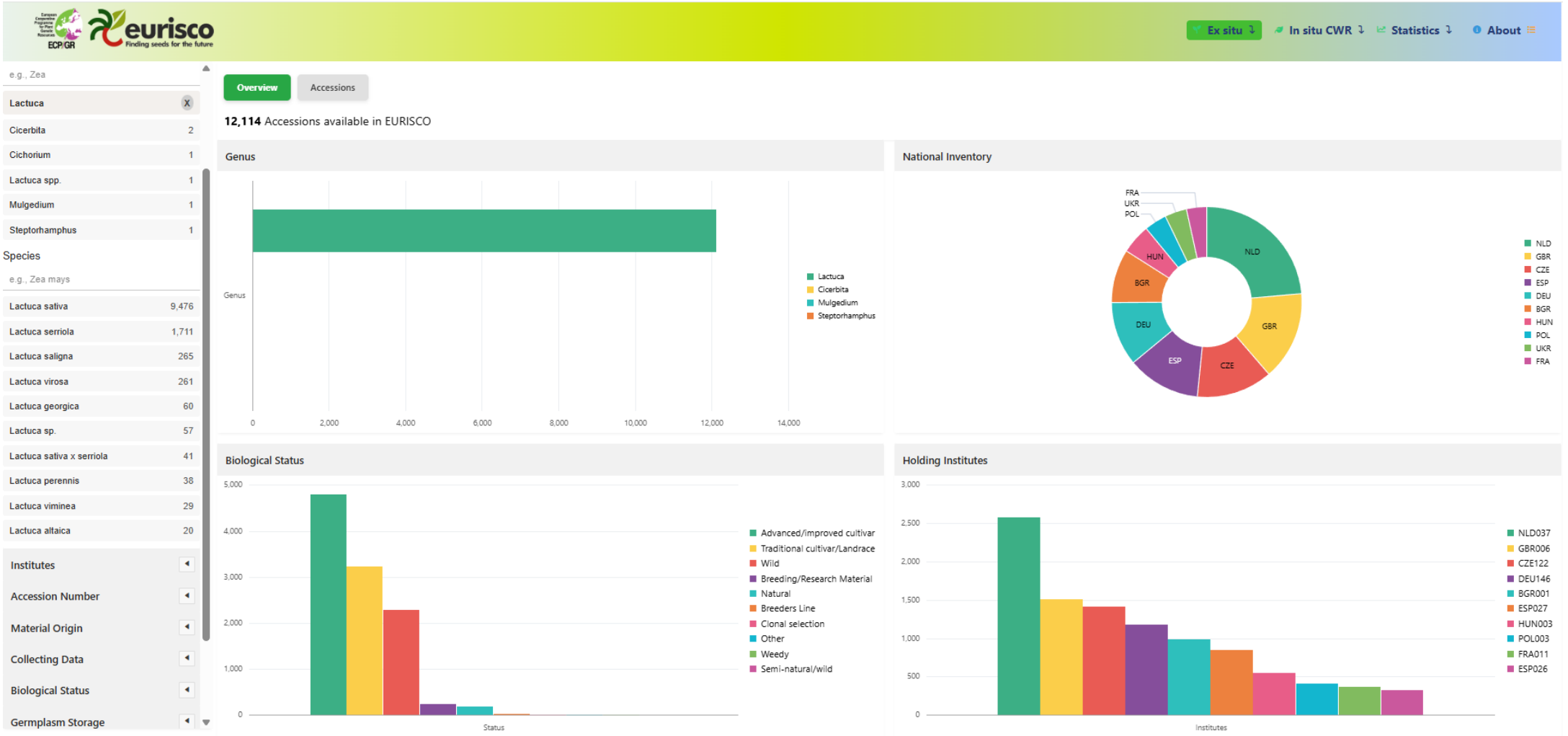
EVA
European Evaluation Network

- Expand the existing EVA collection and add genotyping and phenotyping data
- Collect new phenotyping data on the existing collection to explore in future candidate gene studies
- Add new traits with potential interest for producers:
  - Shape and diameter of bottom
  - Number and area of useful leaves
- Performance trials in multiple (production) environments
- Expand to pre-breeding activities (e.g. RIL populations)
- Leverage expertise and capacity of new partners
- Explore funding opportunities

ECP/GR

Outlook: EVA Lettuce 2.0

In EURISCO, there are ~12.000 Lactuca accessions listed



ECP/GR

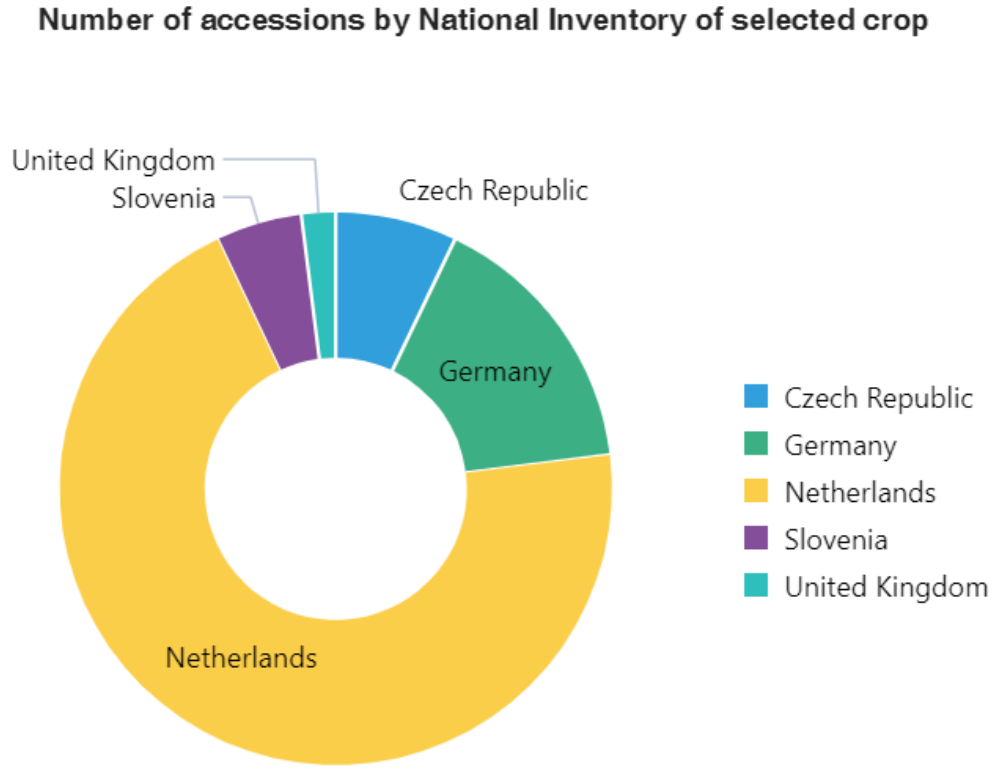
Lettuce accessions with C&E data in Eurisco*

National Inventory report

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Netherlands	1508
Germany	344
Czech Republic	153
Slovenia	109
United Kingdom	43



* C&E module currently not available due to system upgrade. Information status 2025

ECP/GR

Next Call for ECPGR Grant Scheme opens in November

- **Deadline:** likely February 2027, submitted by WG chair
- **Scope:** support priority activities of ECPGR for Phase XI
- **Eligibility:** WG members of eligible ECPGR member countries can receive funding for staff costs, equipment, supplies, travel and meeting costs
- **Available budget:** max 30.000 Euros per funded project, including 10% coordination budget for activity coordinator

https://www.ecpgr.org/grant-scheme/faq

ECP/GR

Acknowledgements





EVA Lettuce Network partners:

WAGENINGEN UNIVERSITY & RESEARCH

crea Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

Limagrain de la terre à la vie

ISI

Zollinger bio

GFPi

INRAE

NordGen

sativa

GAUTIER semences

AMERICAN FARM SCHOOL Thessaloniki · Greece

Genotyping:

IGATech

Funding:

Federal Ministry of Food and Agriculture

EVA
European Evaluation Network

ECP/GR


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THANK YOU
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