

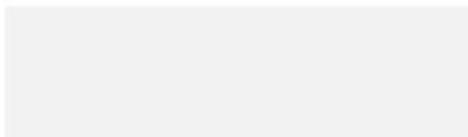
# Boosting organic seed and plant breeding across Europe

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## LIVESEED

Horizon 2020 RIA: 2017 -  
2021



Civil Group Dialog – Organic Farming  
24<sup>th</sup> Oct 2023



## LiveSeeding

Horizon Europe IA: 2022 - 2026

# Great Challenges for Sustainable food production

## European Farm to Fork Strategy

- **Reduce environmental and climate footprint** of food system
- Strengthen resilience and food security in **face of climate change and biodiversity loss**
- Access to **sufficient, nutritious, sustainable and affordable food**
- Facilitation of **global transition of food systems**
- Circular bio-based economy, **reduction of nutrient losses by 50%**
- **Reduced pesticides and antibiotics by 50%**
- **Increase organic farming to 25% of total farmland by 2030**



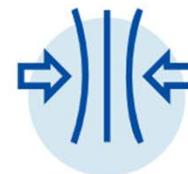
climate  
footprint



global  
transition

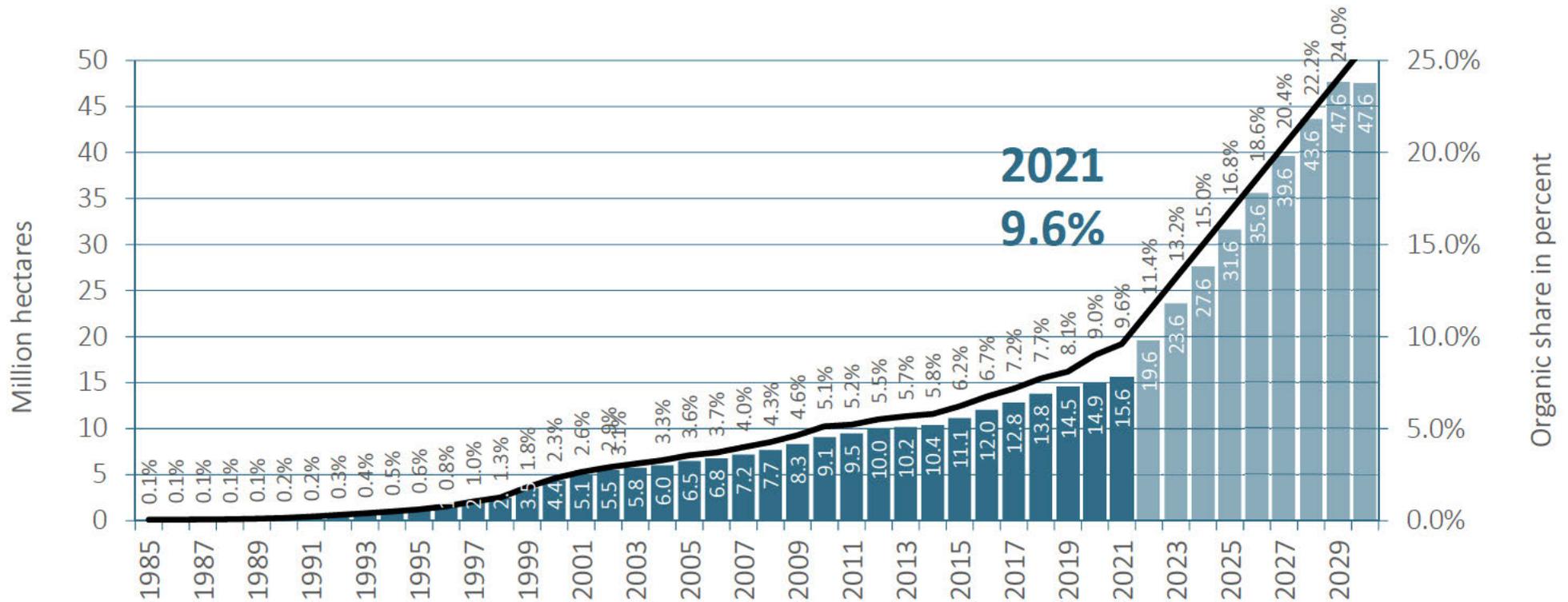


new  
opportunities



resilience

# European Union: Growth of organic area 2000-2021 and projection to reach 25% by 2030



European Union: Growth of the organic agricultural land and organic share 1985-2018, Projection 2030

Source: FiBL-IFOAM-SOEL-Surveys 2001-2020, FiBL projection

<https://www.organic-world.net/yearbook/yearbook-2021>



# Requirement of varieties suited for organic production

- Varieties adapted to organic farms, which deliver sufficiently high and above all stable yields of high quality even under low-input conditions and build up soil fertility.
- Specific variety requirements:
  - Rapid youth development
  - Nutrient efficiency and high N-fixation
  - Weed suppression capacity or weed tolerance
  - Resistance to soil- and seed-borne diseases
  - Good storability, processability, nutritional quality and taste
- Large portfolio of locally adapted varieties for different crop rotations and organic markets
- Option for farm saved seed
- Genetic diversity
- Prohibition of GMOs (including cytoplasm fusion, gene editing, NGT1, NGT2)
- Conservation and free access to GMO-free genetic resources

# Different breeding strategies

- › **Conventional breeding:** **Status quo**
  - › Selection with application of seed treatments, herbicides, optimal nutrient supply
  - › Breeding goals and variety development for conventional / IP farming
  - › Test registered varieties under conventional farming (very few organic variety trials)
  
- › **Breeding for organic farming** **Product oriented**
  - › Considering of the breeding goals of the organic agriculture
  - › No GMO (no cell fusion, no NGT)
  - › Selection or at least variety testing is partly under organic farming conditions
  - › Last multiplication step under organic farming conditions
  
- › **Organic plant breeding:** **Process oriented**
  - › Breeding specifically /exclusively for organic agriculture
  - › Every selection step under organic conditions
  - › Breeding technics in harmony with the organic farming and IFOAM principles
  - › Multiplication steps under organic conditions



# LIVESEED

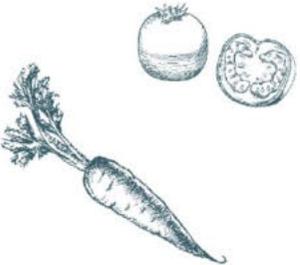


@LIVESEEDeu

[www.liveseed.eu](http://www.liveseed.eu)



## Boosting Organic Seed and Plant Breeding across Europe (2017-2021)

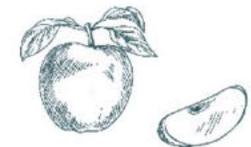


8.9 Mio €  
 52 months  
 50 partner and linked parties  
 18 European countries  
 125 stakeholders

Inter- and transdisciplinary approach of co-development of innovations



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727230 and by the Swiss State Secretariat for Education, Research and Innovation (SERI) under contract number 17.00090. The information contained in this communication only reflects the author's view. Neither the Research Executive Agency nor SERI is responsible for any use that may be made of the information provided.



# Aim: Improve integrity and competitiveness of organic sector by reaching 100% organic seed of cultivars suited for Organic Agriculture

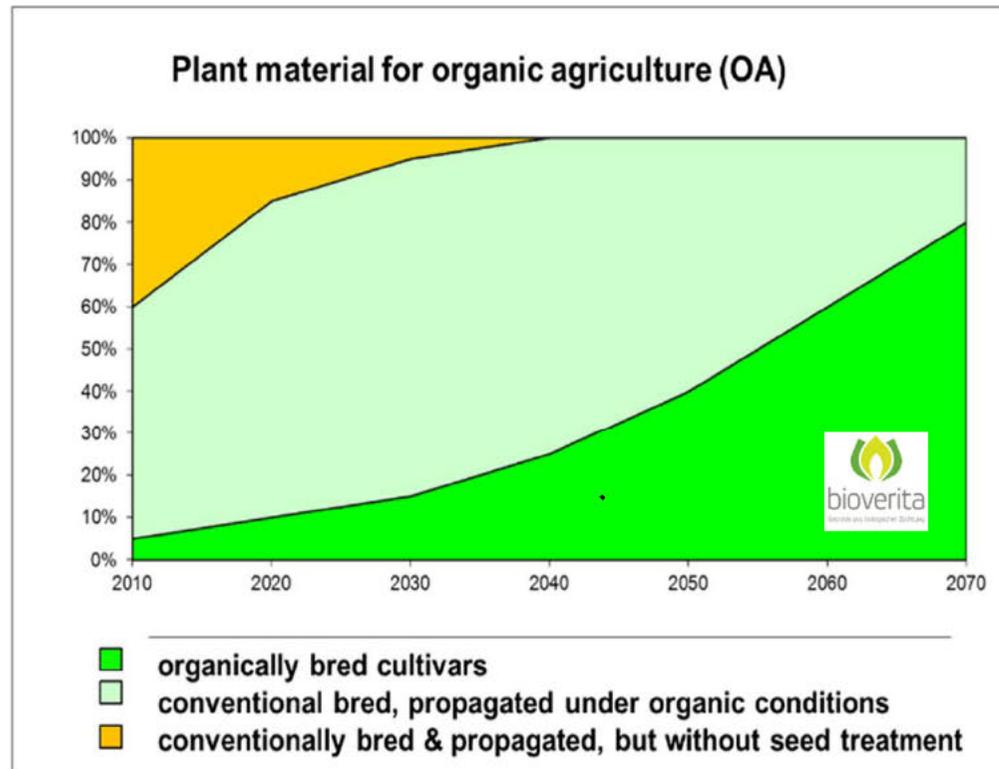
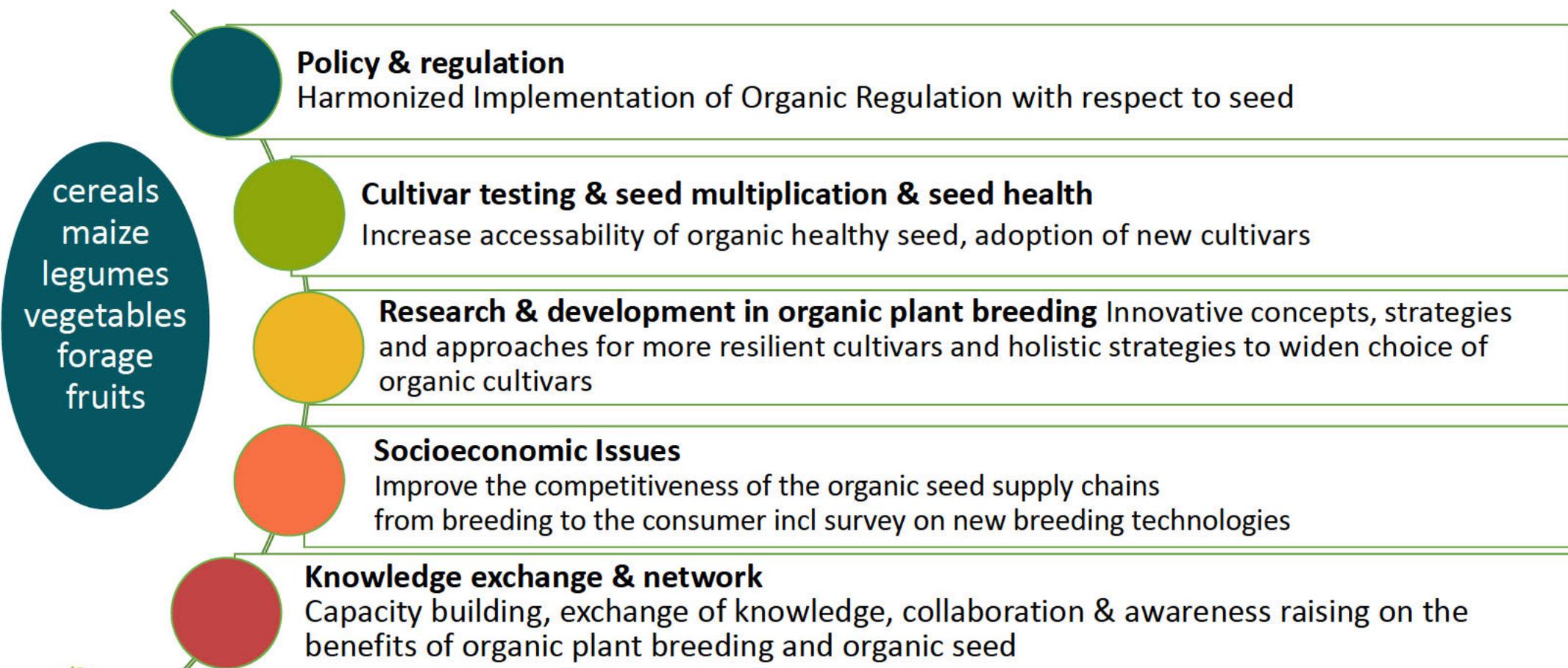


Figure 1: Schematic time line to reach the goal of 100% organically propagated seed of suitable cultivars (light green) in short term and to foster cultivars specifically bred for organic farming systems (bright green) in the long term

## Scope of activities

to reach 100% organic seed of cultivars suited for Organic Farming by 2036



# Transparency of organic seed supply and demand

## Regulation & policy framework regarding production, use, transparency of organic seed



Regulation & policy framework regarding organic seed

**21 COUNTRIES**

explored for their implementation of the EU Organic Regulation



**71 COMMITMENTS**

on a national level to improve the implementation of the EU Organic Regulations



**21 PRESENTATIONS**

of the EU Router Database for Organic Seed

**450 NATIONAL STAKEHOLDERS**

consulted across Europe

**772 FARMERS**

consulted on factors influencing their organic seed use



**23 VISITS**

and workshops organised across Europe



**350 SEED SUPPLIERS**

consulted on factors hampering organic seed supply



**400 STAKEHOLDERS**

reached via dissemination events



We consulted

**29 DATABASE MANAGERS**

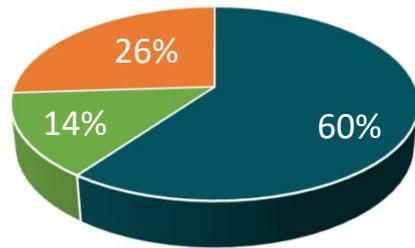
**29 NATIONAL AUTHORITIES**

**60 CERTIFICATION BODIES**

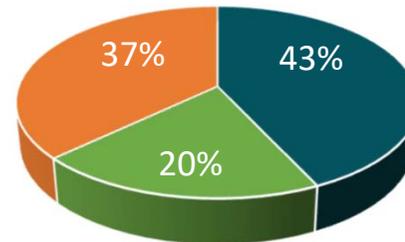


# First status quo analysis on organic seed in EU and Switzerland in 2016

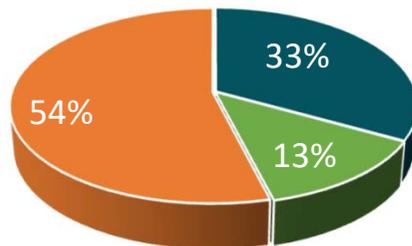
Northern Europe (23'887 t)



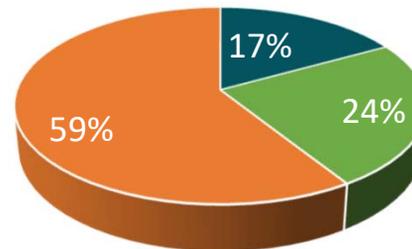
Central Europe (40'622 t)



Southern Europe (55'363 t)



Eastern Europe (24'692 t)



New organic regulation 2018/848 will phase out derogation for non-organic seed latest by 2036

NON-ORGANIC SEED SUPPLY \*

ORGANIC SEED SUPPLY

ORGANIC FARM SAVED SEED

<https://orgprints.org/38616/>

<https://orgprints.org/id/eprint/44726/>

# EU wide router database for availability of organic seed



Interface to:  
**organicXseeds**

en

## Welcome to the European database for organic seeds

✓ Language successfully changed

### Objectives of the European router database

The European database for organic seed has been developed within the EU project LIVESEED. Its objective is to create more transparency for the EU member states and seed suppliers regarding available offers of organic seeds, and to increase the supply of organic seed in the EU member states and Switzerland.

The national databases, however, will continue to be the basis for farmers to check the availability of organic seeds and to apply for derogations when necessary. The European database enables seed suppliers to manage their supply in all EU member states and Switzerland from one account. Registered seed suppliers can upload information about their available organic seed supply and indicate to which countries the individual offers can be delivered. When a seed supplier requests to list a seed offer in a national database, the competent authority receives a notification to verify the information provided by the seed supplier. The competent authority may then include the offer in its national

### Financing through LIVESEED

Contact: FiBL Germany

Tel. +49 69 7137899-855 [seeds4organic@fibl.org](mailto:seeds4organic@fibl.org)

In case you experience any difficulties regarding the use of the website, please contact us

### Login

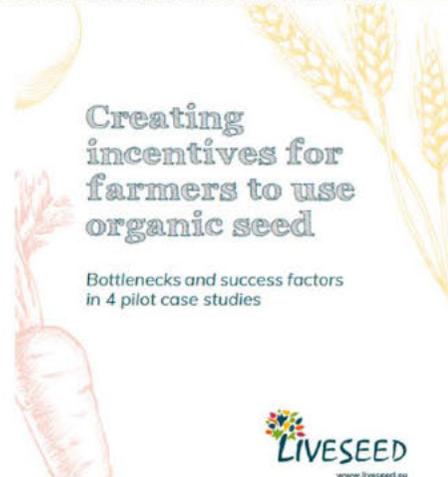
[Forgotten password](#)

[⇒ Home](#)

[⇒ Search for organic seed supplier](#)

[⇒ Register as organic seed supplier](#)

[www.seeds4organic.eu](http://www.seeds4organic.eu)



<https://www.liveseed.eu/tools-for-practitioners/booklets/>

# WP1 Regulation & Policy – Potential Impact

Innovation	Target Groups	Impact
EU router database	Seed companies, national authorities	One entry point for seed offers Larger availability of organic seed standardized reporting / monitoring
<a href="#">A national roadmap towards 100% organic seed by 2036</a>	national authorities, seed companies	Supporting guide for stakeholder and authorities to work on national roadmaps
Infographic on incentives for farmers to use organic seed	all actors along the supply chain	Awareness raising how to stimulate use of organic seed
Declaration on organic seed	all actors along the supply chain	71 voluntary commitments from 10 EU countries



A national roadmap towards 100% organic seed

**Main findings**

- Research survey and an extensive stakeholder consultation process over four years in 20 European countries, the current increase in production and use of organic seed in Europe cannot be alone to reach the goal of 100% organic seed by 2036.
- Seed companies need additional data on the actual demand for organic seed and diversification in strategies for the different crops to invest in scaling up organic seed production.
- Increased availability of organic seed from publicly and locally selected varieties is needed to enable farmers to increase organic seed.
- At the national level, a roadmap with intermediate goals should be developed to operationalize changes by 2036.
- LIVESEED developed a decision tree for national seed support groups to facilitate making a roadmap in a step-by-step.

**Key policy recommendations**

- LIVESEED developed a range of recommendations for policymakers on how to increase the availability and use of organic seed availability. In order to comply with the new Organic Regulation which aims at phasing out the use of non-organic seed in organic farming by 2036 (Article 12, Regulation (EU) 2018/848).
- Member States' national organic action plans should include measures to improve the national seed database, establish or strengthen existing organic seed support groups and elaborate organic plant breeding and on-farm testing.
- Seed support groups are recommended to develop a national roadmap towards 100% organic seed using the LIVESEED framework including the national and international goals for each intermediate 100% organic seed use for a specific crop.



# Improving cultivar testing, seed multiplication & health for high quality seeds for the organic sector



## Organic Cultivar Trials and Seed Health

More than  
**50 COMMON BUNT TREATMENT**  
methods tested



More than  
**40 SEED HEALTH ISSUES COLLECTED**



### 25 FIELD TRIALS

for crop specific protocols for testing



### 13 CHALLENGES

collected from experiences with DUS and VCU trials

### 100 EXPERTS

networked in cross visits



### 46 SMART PRACTICES

shared on Organic Farm Knowledge Platform's Seed Section



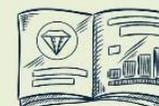
### 50 PRIORITY SPECIES

recommended for the temporary experiment on organic varieties



### TOOLBOX

on Organic Heterogeneous Materials



### INPUTS FOR THE DELEGATED ACTS OF THE NEW EU ORGANIC REGULATIONS



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101019160 and No. 101019161. The information contained in this communication only reflects the author's view. Funding and the EU do not guarantee the accuracy of the information in this communication.



# WP2 – Cultivar testing, seed production & seed health

Improve access to a wider pool of high quality seeds for the organic sector

## Cultivar trials for OA

- Overview of current organisational models in Europe
- **A strategy to set-up and optimise cultivar testing networks for organic**

D2.3, D6.3  
2 booklets

## Organic cultivar registration

- Tools for Organic Heterogeneous Material identification
- **Guidelines for organic varieties**
- **Inputs provided to the legislators**

D2.4  
D6.3

## Organic seed production

- 100 EU experts networked in cross visits
- Videos and a **booklet** for promotion
- **50+ smart practices shared on organic-farmknowledge.org (seed section)**

D2.6  
1 booklet

## Seed quality and health

- **2 comprehensive studies with solutions shared with end-users** (Common bunt management on Wheat + Novel seed ageing method on Carrot)
- **Outline of an organic seed quality & health strategy**

D2.5  
D6.3

*D2.3: Frugal models for on farm cultivar trials*

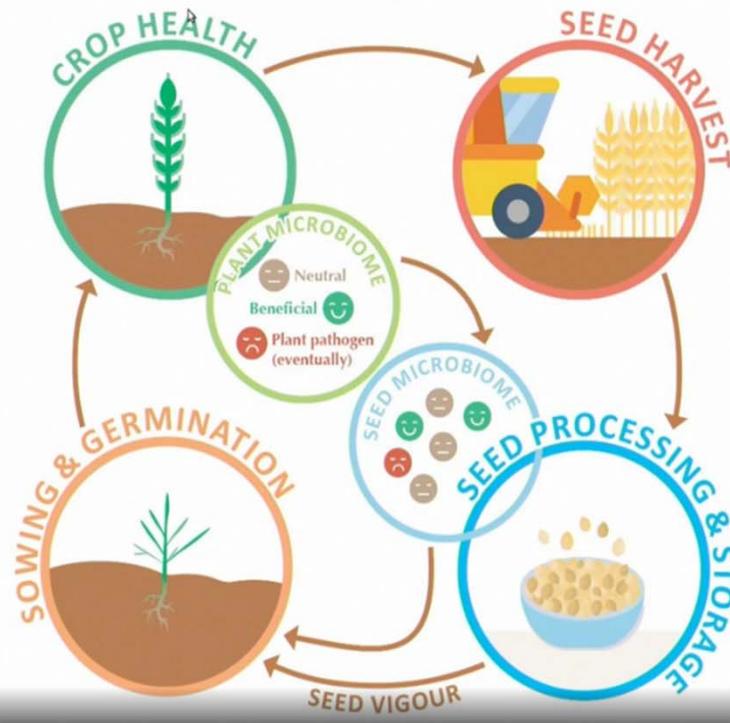
*D2.4: Guidelines for adjusted protocols for release of organic varieties*

*D2.5: Inventory on seed health*

*Contribution on seed health strategy to D6.3 policy recommendation (former D2.7)*

# Holistic Seed Health Strategy

Outcome 1:  
Seed and plant  
health:  
a continuum  
(Infographic & Strategy)

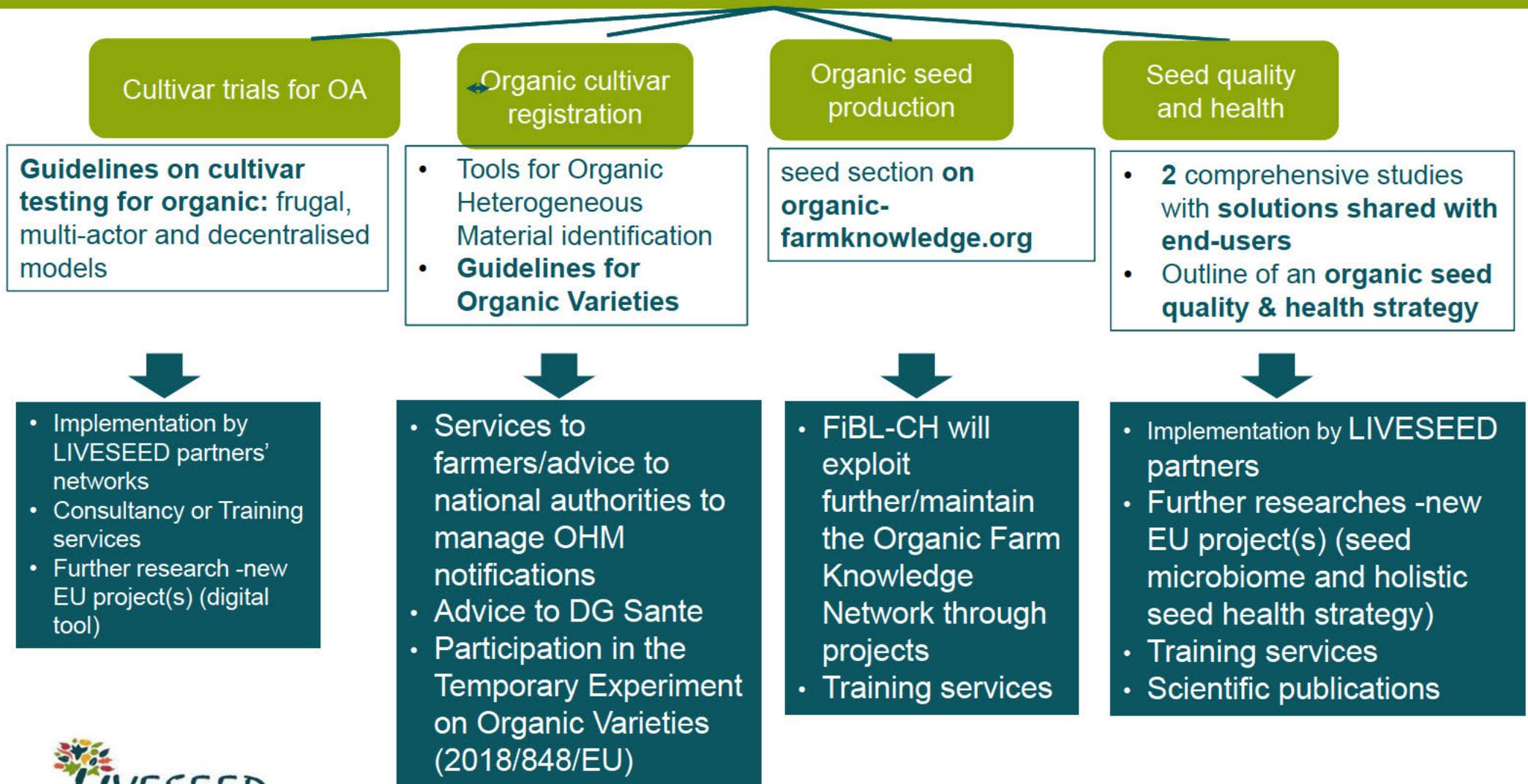


- High seed vigour maintenance is important for resilience
- Organic farming is based on healthy soils and diversified crop rotation
- Management of seed production from sowing till seed harvest
- Impact of seed microbiome
- Seed treatments as last option

## WP2 Cultivar testing, seed production, seed health – Potential Impact

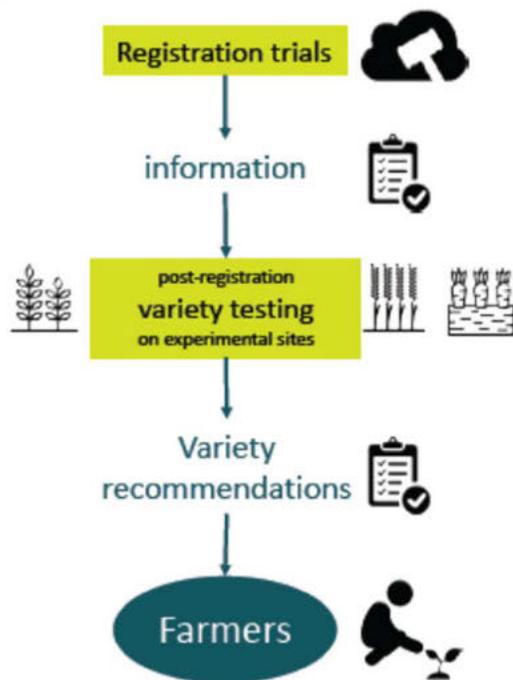
Innovation	Target Groups	Impact
<b>Guidelines</b> for organic on-farm <b>cultivar trials</b> : new models	Farmers, Advisors, Breeders	Informed cultivar choice fit for purpose, organic networks initiated or coordinated (e.g. UK, DK, Hung., Slov., FR, NL, Lv, IT)
<b>Toolbox for OHM</b>	Policy makers National authorities Breeders	Direct contribution to the delegated act (EU Organic Regulation)
<b>Guidelines for Organic Varieties</b>	Policy makers National authorities Breeders	Discussion with stakeholders (incl. DG SANTE and EU national authorities, examination offices), direct contribution to the 7 year experiment (EU Organic Regulation)
<b>Seed section on OFK platform</b> to share smart practices on organic seed and breeding	Farmers, Advisors, Breeders Seed companies	+50 tools uploaded and described, statistics to be monitored on OFK to assess the impact over months
<b>Novel seed ageing method</b> to study the impact of seed vigour on tolerance to <i>Alternaria</i> on carrots or shelf life of applied biological	Seed companies Scientists	Innovation on organic seed: new solutions for organic under development by seed companies (e.g. Bing. Saatgut, FSF, Sativa, Vitalis), like adapted packaging or applied beneficial microorganisms on seed
Solutions to manage <b>common bunt on organic Wheat</b>	Farmers, Advisors, Seed companies, Breeders	Online platform available in English, French and German. More than 4,000 stakeholders reached (workshops, Videos...)

# WP2 – Exploitation Plans

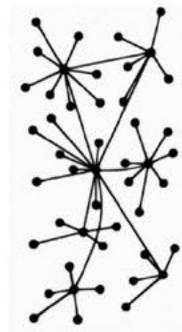


# New models for post-registration on-farm cultivar testing networks

“conventional” variety testing



**Decentralized on-farm cultivar testing networks:**  
multiactor – simple - cost efficient - interactive –  
shared data – digital tools/app

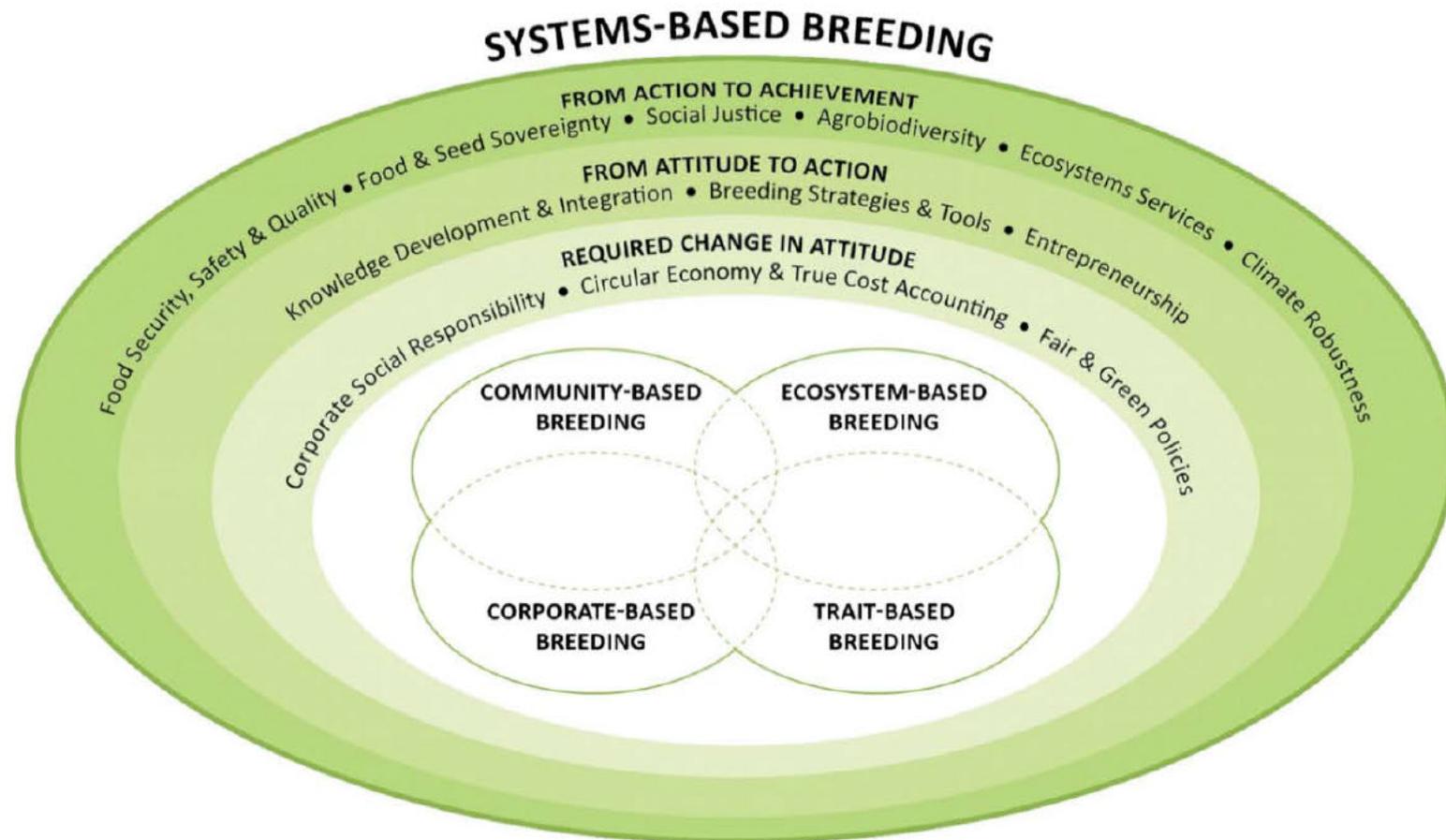


Intuitive platform + crowdsourced data from experts and growers + environmental data + analytics =  
POWERFUL RECOMMENDATION ENGINE

[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP2 > D2.3 Frugal, multi-actor and decentralised cultivar evaluation models for organic agriculture

Horizon 2020  
grant No 727230.

# Systems-based breeding beyond direct benefit of value chain



Lammerts van Bueren et al 2018. Towards resilience through systems-based plant breeding. A review. *Agron. Sustain. Dev.* 38(42).  
<https://doi.org/10.1007/s13593-018-0522-6>



[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP3 > M3.5 Organic plant breeding in a systems-based approach  
[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP3 > D3.5 Novel breeding concepts and strategies for organic and low-input farming systems

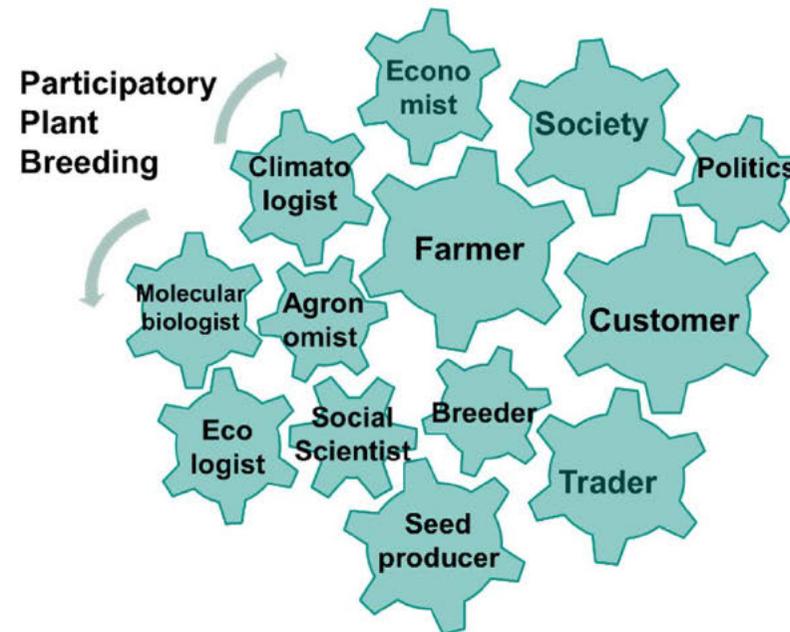
# Breeding for functional biodiversity

Develop concepts, strategies, and tools for the development of cultivars with improved resilience:

- Genetic diversity within cultivars e.g. **composite cross populations and dynamic populations** that can adjust to multiple stresses (cereals, legumes) = organic heterogeneous material OHM
- Develop concepts for optimized **cultivar mixtures** (cereals)
- Breeding cultivars suited for **species mixtures** (legume – cereal mixtures, Lucerne – grass species, agroforestry)



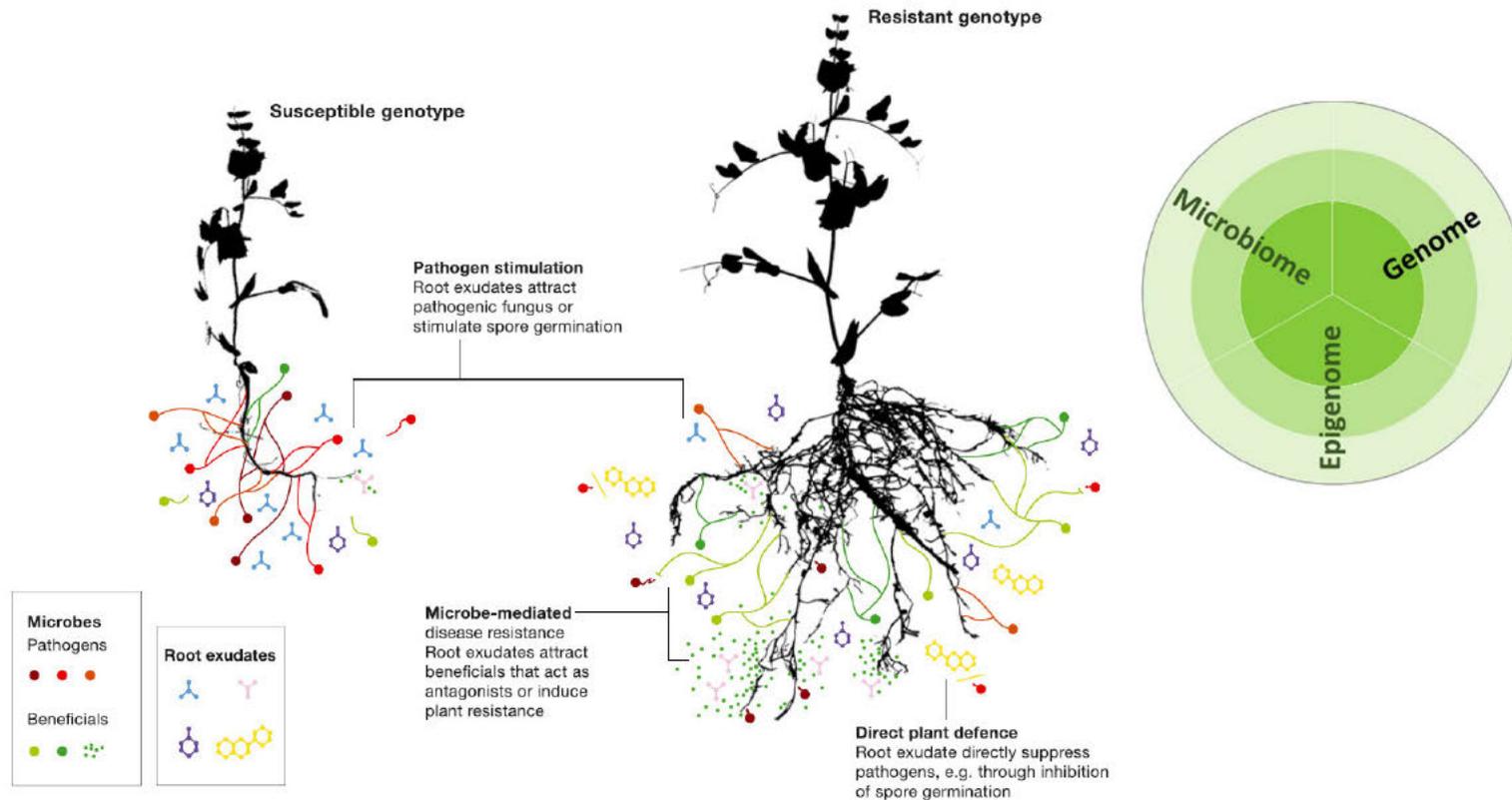
# Decentralized Participatory Plant Breeding in tomato, maize and cereals



- Embedding Cultivated Diversity in Society for Agro-Ecological Transition, *Chable, V.; Nuijten, E.; Costanzo, A.; Goldringer, I.; Bocci, R.; Oehen, B.; Rey, F.; Fasoula, D.; Feher, J.; Keskitalo, M.; Koller, B.; Omirou, M.; Mendes-Moreira, P.; van Frank, G.; Naino Jika, A.K.; Thomas, M.; Rossi, A.. Sustainability 2020, 12, 784.*  
<https://doi.org/10.3390/su12030784>

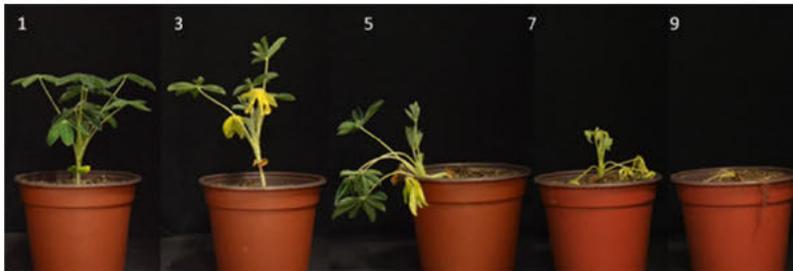
# Breeding on the holobiont: plant with associated microbiome community mediated disease resistance

A high-throughput screening system that successfully differentiates pea genotypes with resistance against soil fatigue caused by a complex of different root pathogens and related microbiome community

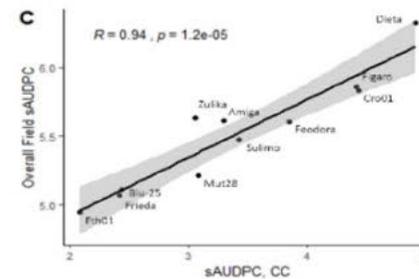
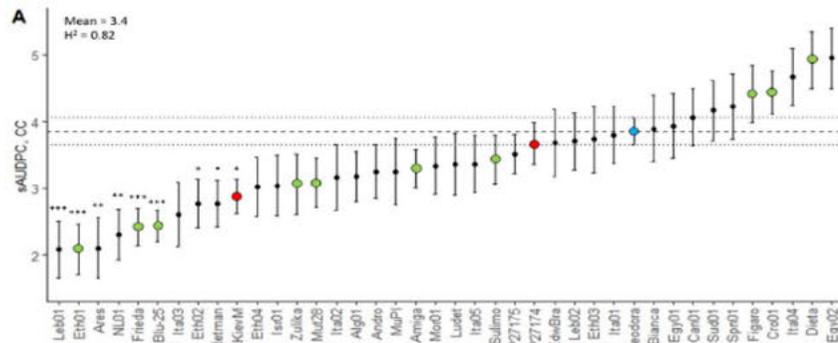


Wille et al. *Plant Cell Environ* 2019; 42:1–21. ; Wille et al. *Front. Plant Sci.*, 2020 <https://doi.org/10.3389/fpls.2020.542153>  
; Ares et al. *Front. Microbiol.*, 2021 <https://doi.org/10.3389/fmicb.2021.636009>

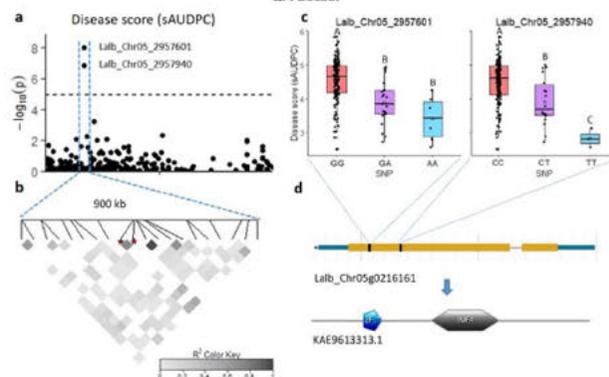
# White lupin breeding for anthracnose tolerance, low alkaloid content, calcereous soil and drought tolerance



Development of screening test for anthracnose tolerance in white lupin under controlled conditions



Validation with observed tolerance in the field *Alkemade et al. 2020 Plant Disease*



Genom wide assocation study  
 → 1 QTL encodes for protein with a RING zinc-finger and VWFA domain potential resistance gene *Alkemade et al. 2021 TAG submitted*

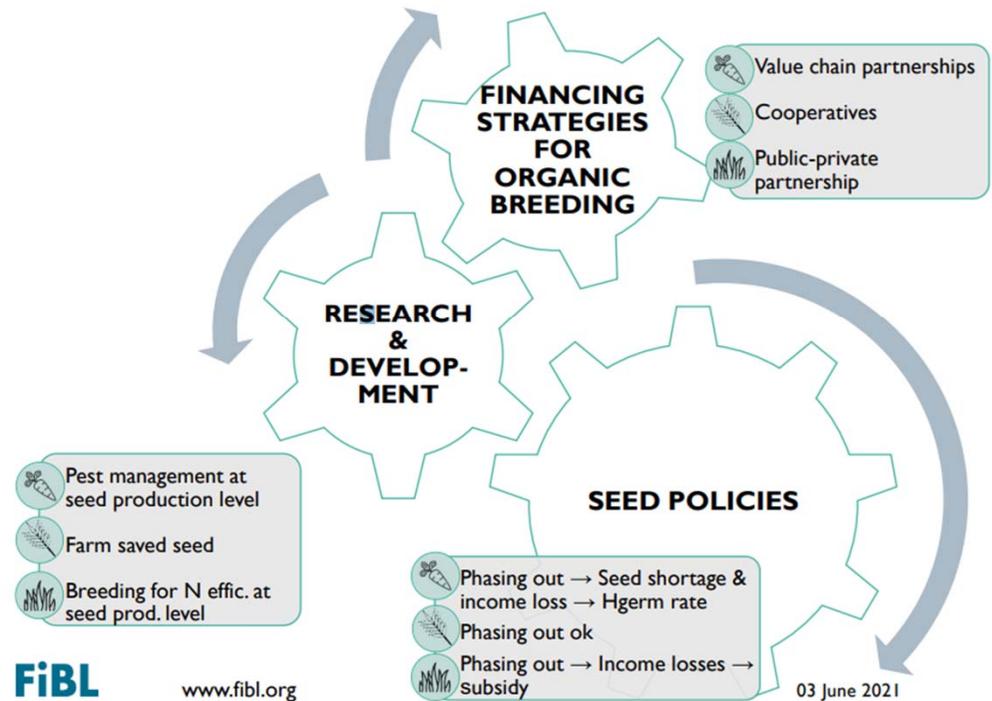
# WP3 Organic Breeding – Potential Impact

Innovation	Target Groups	Impact
New multi-actor, on-farm population breeding models	Farmers, advisors, breeders	Better methods for developing well adapted populations Increase in agro-biodiversity
New CCPs, advanced lines, cultivars, base material	Farmers, advisors, breeders	better adapted seeds for a large range of crops
New breeding methodologies and methods	Breeders, researchers, farmers	More effective breeding for organic farming
Development of breeding networks for various crops	breeders, researchers, farmers	Closing knowledge gaps at various levels: breeding methods, breeding material, new approaches
Holistic concepts on organic breeding and plant-microbiome interactions	breeders, researchers, farmers	Improved basis for the further development of organic breeding and all relevant related knowledge fields

# WP4 Socioeconomic Aspects – Potential Impact

- The first overall statistics of Organic Seed supply and demand in EU+CH(+UK)
  - +500% Organic Wheat seed supply needed by 2030
  - +1500% Organic Carrot seed by 2030!
  - Challenge of organic forage breeding (underdeveloped, at times perceived as not needed)
- How to get there? an Integrated roadmap

## Results from different case studies



# WP 5: Communication, dissemination and exploitation

RSR, Italy



## Dissemination

**12,000 VISITORS**  
*of the LIVESEED website*



**20 VIDEOS PRODUCED**



**196 EVENTS**  
*attended to present the project*

**65 PRACTICE ABSTRACTS**  
*for farmers*



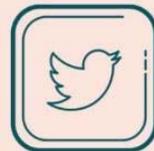
**120 EVENTS ORGANISED**

**145 STAKEHOLDER**  
*platform members representing the value chain*

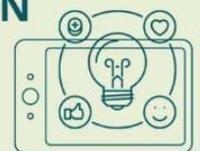
**73 POPULARIZED PUBLICATIONS**  
*over the project*

**7 BOOKLETS**  
*produced*

**446,000 REACH OF TWITTER POSTS**



**3,500 POSTS ON SOCIAL MEDIA**



**46 PRACTICAL TOOLS**

*added from LIVESEED to Organic Farm Knowledge Platform's Seed Section*



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101019750 and by the Swiss State for research, innovation and education under contract number 17.00000. The information contained in this communication only reflects the author's view. Neither RSR nor LIVESEED is responsible for any use that may be made of the information it contains.



# Dissemination

**Creating incentives for farmers to use organic seed**

Bottlenecks and success factors in 4 pilot case studies



**Success stories on organic seed production & breeding**

Experiences from LIVESEED Cross Visits



**Guidelines for organic on-farm cultivar trials**

A practical guide for researchers and facilitators



**Boosting organic seed and breeding across Europe: recommendations for stakeholders and policy makers**

A roadmap towards achieving 100% organic seed from adapted cultivars in the organic sector



**LIVESEED BOOKLETS**

**LIVESEED Final Congress & European Workshop on organic seed**

THE **DATE**

**Organic Innovation Days**  
24-25 November 2020 / Brussels

**Innovation for organic seed and cultivars**

**Join us to:**

- discover the innovations in organic seed production and plant breeding
- discuss the results of the LIVESEED project
- expand your network & get updates on the expected Horizon Europe calls

**ONLINE International Conference on BREEDING AND SEED SECTOR INNOVATIONS FOR ORGANIC FOOD SYSTEMS**

by EUCARPIA  
Section Organic and Low Input Agriculture  
Jointly with LIVESEED, BRESOV, ECOBREED, FLPP projects and ECO-PB



**International Conference on Breeding and Seed Sector Innovations for Organic Food Systems**

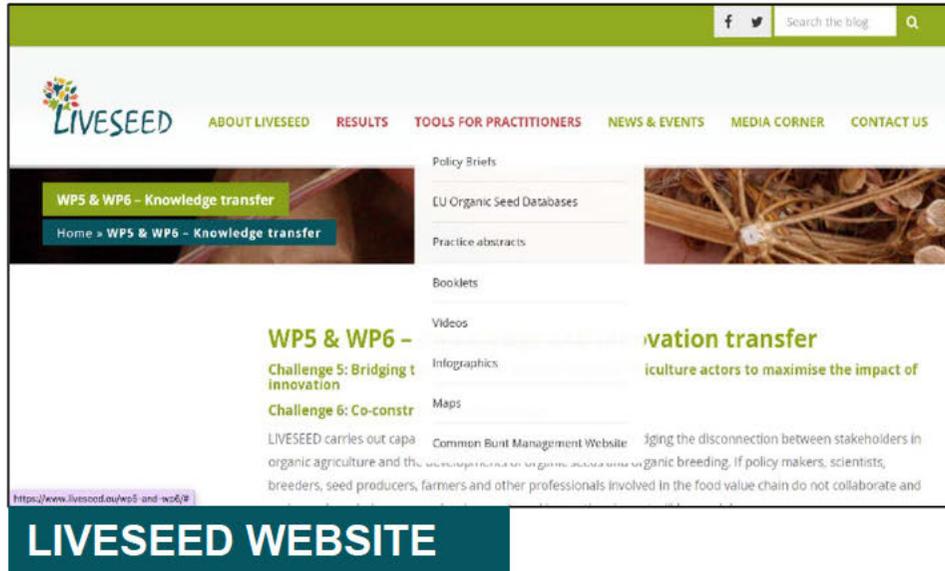
**OWC Seed Ambassadors Pre-conference**

**Organic World Congress 2021** Pre-conference

**Seed Ambassadors**  
Building an International Network to Advance Organic Seed Systems

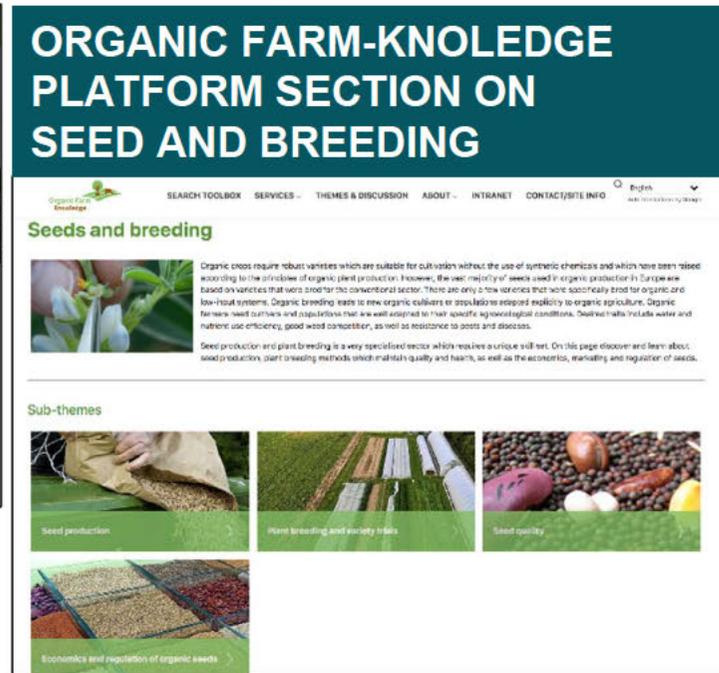



# Dissemination



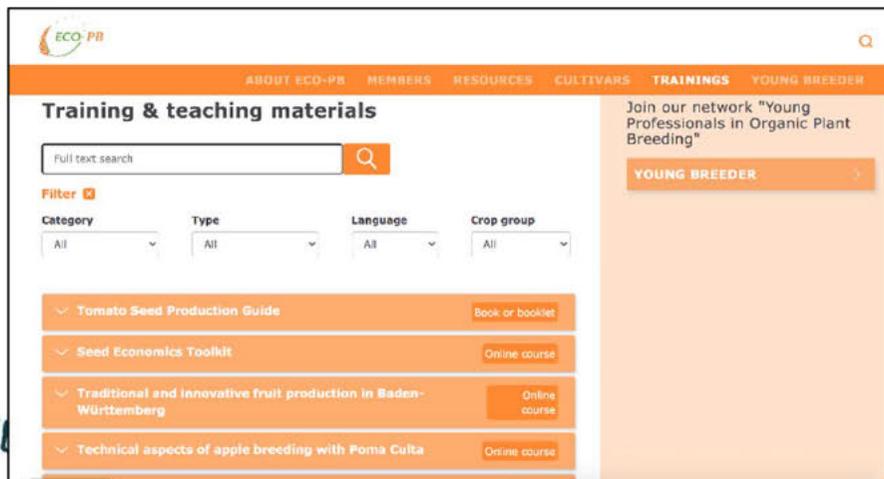
The screenshot shows the LIVESEED website with a navigation menu including 'ABOUT LIVESEED', 'RESULTS', 'TOOLS FOR PRACTITIONERS', 'NEWS & EVENTS', 'MEDIA CORNER', and 'CONTACT US'. A search bar is located in the top right. The main content area features a header 'WP5 & WP6 - Knowledge transfer' and a breadcrumb trail 'Home > WP5 & WP6 - Knowledge transfer'. A sidebar on the right lists various content types: Policy Briefs, EU Organic Seed Databases, Practice abstracts, Booklets, Videos, Infographics, and Maps. The main text discusses 'WP5 & WP6 - Knowledge transfer' and 'Challenge 5: Bridging innovation' and 'Challenge 6: Co-construction'. It mentions 'LIVESEED carries out capacity building activities to improve organic breeding, if policy makers, scientists, breeders, seed producers, farmers and other professionals involved in the food value chain do not collaborate and...'. A URL is provided at the bottom: 'https://www.liveseed.eu/wp5-and-wp6/#'.

## LIVESEED WEBSITE



The screenshot shows the 'Seeds and breeding' section of the Organic Farm Knowledge Platform. The navigation menu includes 'SEARCH TOOLBOX', 'SERVICES', 'THEMES & DISCUSSION', 'ABOUT', 'INTRANET', and 'CONTACT/SITE INFO'. The main heading is 'Seeds and breeding'. Below it, there is a sub-heading 'Organic cross require robust varieties which are suitable for cultivation without the use of synthetic chemicals and which have been raised according to the principles of organic plant production. However, the seed quality of seeds used in organic production in Europe are based on varieties that were bred for the conventional sector. There are only a few varieties that were specifically bred for organic and low-input systems. Organic breeding leads to new organic cultivars or populations adapted explicitly to organic agriculture. Organic farmers need cultivars and populations that are well adapted to their specific agroecological conditions. Desired traits include water and nutrient use efficiency, good weed competitiveness, as well as resistance to pests and diseases.' Below this text, there are four sub-themes: 'Seed production', 'Plant breeding and variety trials', 'Seed quality', and 'Economics and regulation of organic seeds'. Each sub-theme has a corresponding image.

## ORGANIC FARM-KNOWLEDGE PLATFORM SECTION ON SEED AND BREEDING



The screenshot shows the ECO-PB website with a navigation menu including 'ABOUT ECO-PB', 'MEMBERS', 'RESOURCES', 'CULTIVARS', 'TRAININGS', and 'YOUNG BREEDER'. The main heading is 'Training & teaching materials'. Below it, there is a search bar 'Full text search' and a filter section with dropdown menus for 'Category', 'Type', 'Language', and 'Crop group'. The main content area lists several training materials: 'Tomato Seed Production Guide' (Book or booklet), 'Seed Economics Toolkit' (Online course), 'Traditional and innovative fruit production in Baden-Württemberg' (Online course), and 'Technical aspects of apple breeding with Poma Culta' (Online course). A sidebar on the right contains the text 'Join our network "Young Professionals in Organic Plant Breeding"' and a button 'YOUNG BREEDER'.

## ECO-PB WEBSITE ORGANIC BREEDING TRAINING SECTION



# Strategies for Organic Plant Breeding

- Systems-based breeding
- Increase efficiency and diversity of breeding by networking and decentralized participatory breeding programs for local conditions
- Improving impact of breeding by involving all stakeholders in the breeding process (farmer, value chain and community driven breeding)
- Developing new concepts for the ownership of cultivars and their financing
- Participating in political discussions on regulatory framework to foster greater agrobiodiversity (official variety testing, seed regulation)
- Valorization of organic plant breeding along the value chain

[www.bioverita.org](http://www.bioverita.org), [www.engagement.biobreeding.org](http://www.engagement.biobreeding.org)

# Policy recommendations for organic seed use

- Harmonized and **stricter implementation of derogation rules** for non-organic seed (national annex 1, expert groups, roadmap)
- Improved **interactive national databases** of available organic seed as basis for unbureaucratic derogations and monitoring
- **Eu-wide router database** linked to national databases of available organic seed promoted and financially supported by EU authorities
- **Improved data collection and monitoring** on production and use of organic seed → more transparency for seed producers
- **Wider choice of cultivars** adapted to organic production (Breeding and cultivar testing)
- Availability for **novel types of cultivars** like organic heterogeneous materials, organic bred varieties and populations, farmers' selections
- Improve **quality and health of seed** at similar price → seed health strategies, trainings, support in local infrastructure

[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP1 > D1.9 Report on Political Obstacles and Bottlenecks on the Implementation of the Rules for Organic Seed in the Organic Regulation



This project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727230.

# Political Framework Organic Varieties

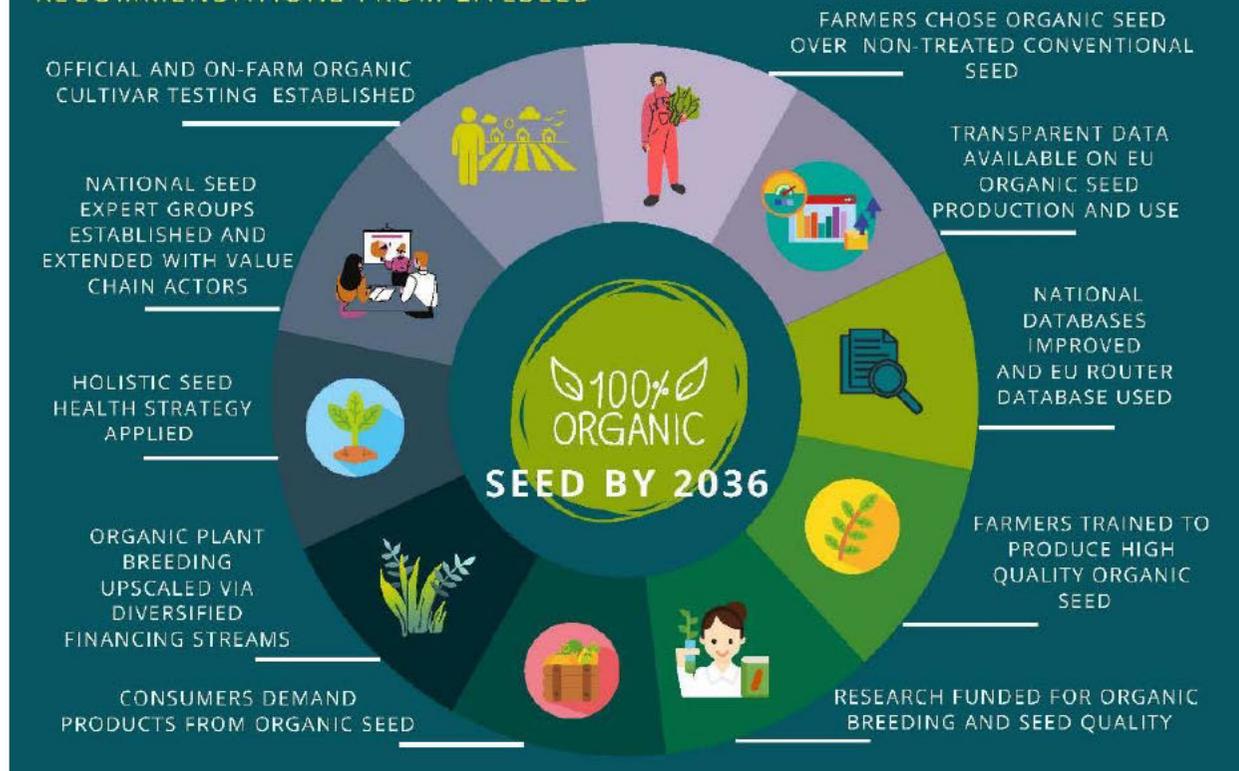
## New EU organic regulation (2018/848) put into force January 2022

- Definition of organic plant breeding included
- Temporary derogation to foster research and **to develop organic varieties suitable for organic production** shall be establish adapted DUS and VCU, as well as the definition of the production and marketing conditions for that material (2023 up to 2030)
  - The implementing should start in July 2023
  - LIVESEED developed **overview on current organizational modes on variety testing for organic agriculture** including post-release VCU testing  
[www.liveseed.eu](http://www.liveseed.eu) > Results > WP2 > Deliverable 2.1

# Synthesis & Recommendations

## A VISION TOWARDS 100% ORGANIC SEED IN THE EU

### RECOMMENDATIONS FROM LIVESEED



## Boosting organic seed and breeding across Europe: recommendations for stakeholders and policy makers

A roadmap towards achieving 100% organic seed from adapted cultivars in the organic sector



[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > D6.3 Synthesis of LIVESEED results and stakeholder and policy recommendation  
[www.LIVESEED.EU](http://www.LIVESEED.EU) > Tools for Practitioners > booklet > Boosting organic seed and breeding across Europe (July 2021)



[www.liveseed.eu](http://www.liveseed.eu)



[Liveseed](https://www.facebook.com/Liveseed)



[@LIVESEEDeu](https://twitter.com/LIVESEEDeu)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727230 and by the Swiss State Secretariat for Education, Research and Innovation (SERI) under contract number 17.00090. The information contained in this communication only reflects the author's view. Neither the Research Executive Agency nor SERI is responsible for any use that may be made of the information provided.



# LiveSeeding in a nutshell



Organic seed and plant breeding to accelerate sustainable and diverse food systems in Europe



Civil Group Dialog – Organic Farming  
24<sup>th</sup> Oct 2023



Co-funded by  
the European Union

Funded by the European Union, the Swiss State Secretariat for Education, Research and Innovation (SERI) and UK Research and Innovation (UKRI). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or REA, nor SERI or UKRI.



UK Research  
and Innovation

# LiveSeeding in a nutshell

## Organic seed and plant breeding to accelerate sustainable and diverse food systems in Europe

- 37 partners from 16 European countries
  - 32 from EU: BE, FR, DE, NL, SW, IT, ES, PT, HU, HR, SI, EL, RO, PL
  - 2 from Switzerland, 2 from UK, 1 affiliated partner in Italy
- several SME as subcontractors
- Innovation Action of Horizon Europe, GA ID: 101059872
- Total 6.6 Mio € (EU, SERI, UKRI)
- 4 years (**Oct 2022 – Sept 2026**)
- Sister project: InnOBreed on organic fruit breeding



# Project's general objective

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Foster the growth of the organic sector and transition towards more sustainable local food systems by delivering high-quality organic seeds of diverse cultivars adjusted to organic farming for a wide range of crops

# Objectives

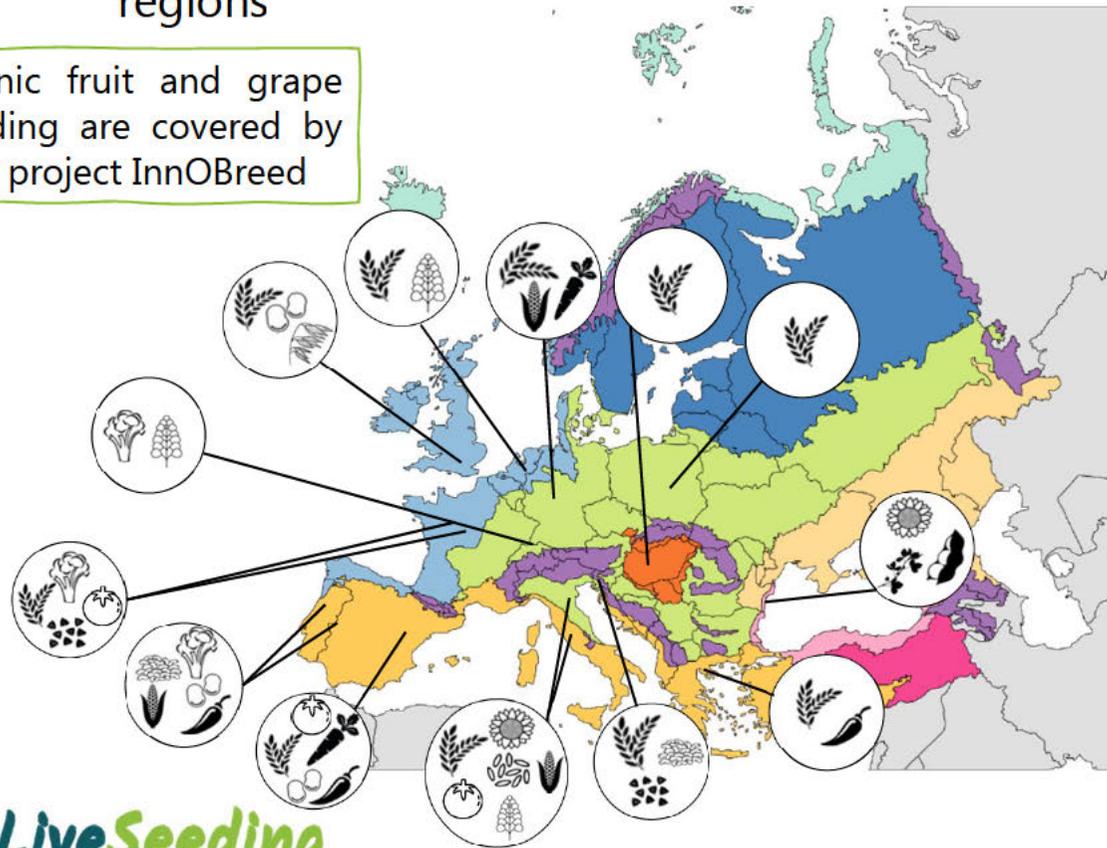
- ✦ Increase and optimize **crop diversity** to be used in organic farming systems
- ✦ advance pre- and post-registration **cultivar testing** dedicated to organic farming
- ✦ Increase **supply of organic seed**
- ✦ Increase **transparency** of the organic seed market
- ✦ Ensure efficient **scaling out and scaling up** of organic seed and breeding initiatives
- ✦ Promote **organic breeding** supported by value chain partners and society
- ✦ **Capacity building and participatory knowledge creation** from seed to plate
- ✦ Promote the **competitiveness of the organic seed and breeding sector**



# Target crops and climatic regions

- 15 different crops of special relevance for the organic sector in different pedoclimatic regions

Organic fruit and grape breeding are covered by sister project InnOBreed



Biogeographical regions of Europe

- Arctic
- Boreal
- Atlantic
- Continental
- Alpine
- Pannonian
- Mediterranean
- Macaronesian
- Steppic
- Black Sea
- Anatolian

After a map by the European Environmental Agency: [www.eea.eu.int](http://www.eea.eu.int)

## ARABLE Cereals



Wheat



Rice



Oat



Maize

## Pseudocereals



Buck-wheat



## Oil seed

Sunflower

## Grain legumes



Broad bean



Lupin



Beans



Soybean

## FODDER



Alfalfa

## HORTICULTURAL



Pepper



Carrot

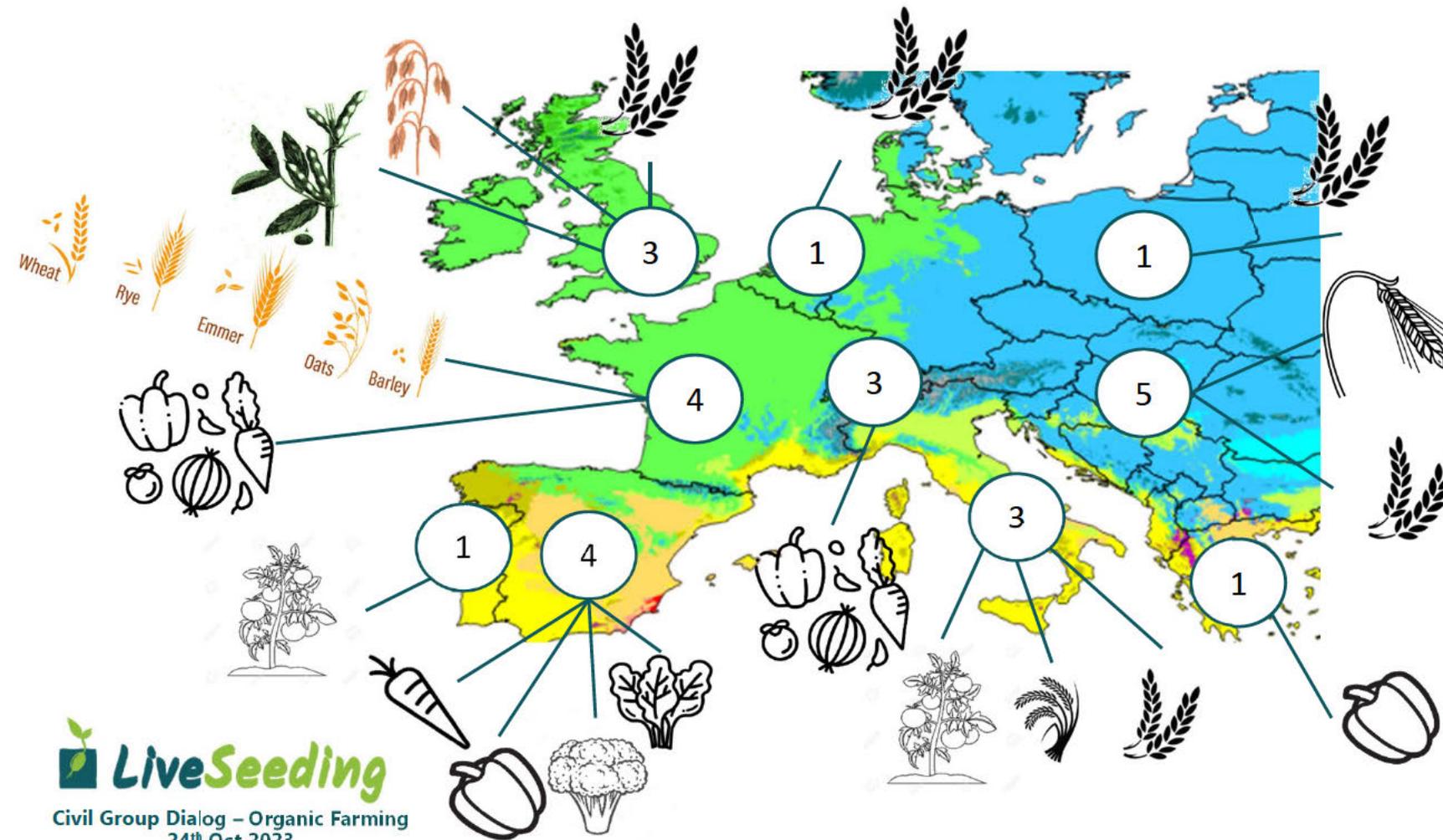


Tomato



Brassica

# Advancing on-farm cultivar evaluation: activities carried out in year 1



**26 case studies identified and diagnosed**

Covering broad range of crops

Varying from national programs to be decentralized and optimized to local community-led cultivar evaluation

# Multi-actor approach

## Inter- and transdisciplinary partners

- 9 research institutions fully dedicated to organic
- 5 organic breeders and seed producers and representatives of the European consortium for organic plant breeding (ECO-PB)
- 2 organic farmers associations
- 7 universities and experts on genetics, participatory and molecular breeding, microbiome, plant pathology, citizen science, socio economy, policy
- 3 examination offices
- 15 SME and 2 large seed and breeding companies
- NGO (European Coordination Let's Liberate Diversity (ECLLD), Red de Ciudades por la Agroecología (RCxAE)
- 4 IT experts

## Additional supported by

- Broad Stakeholder group with over 200 participants
- International Advisory Board
- IPR Board



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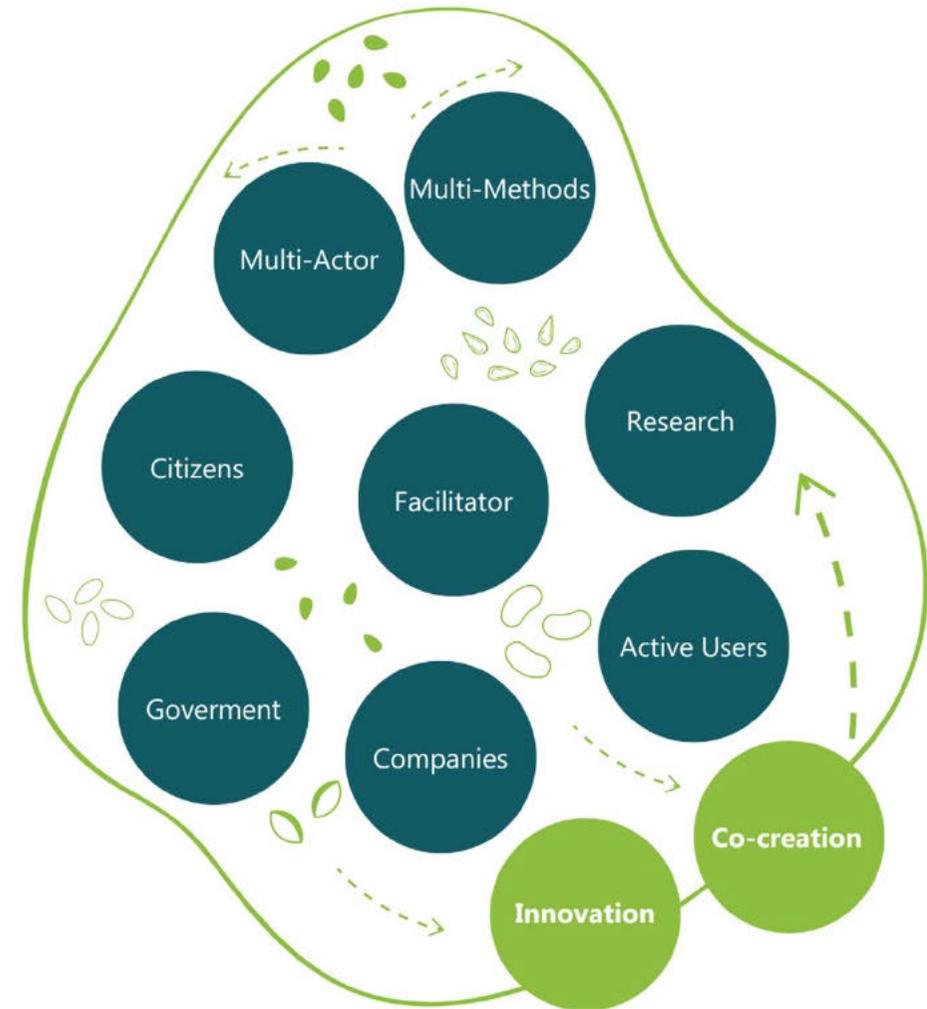
Become a stakeholder of LiveSeeding  
Click on  on website [www.liveseeding.eu](http://www.liveseeding.eu)



# Multi-actor approach & 17 Living Labs

## Characteristics of Living Labs

- open innovation ecosystems in **real-life environments** using **iterative feedback processes** throughout a **lifecycle approach** of an innovation to create **sustainable impact**
- focus on **co-creation, rapid prototyping & testing** and **scaling-up** innovations & businesses, providing (different types of) **joint-value** to the involved stakeholders
- **operate as intermediaries/orchestrators** among **citizens, research organisations, companies and government agencies/levels**



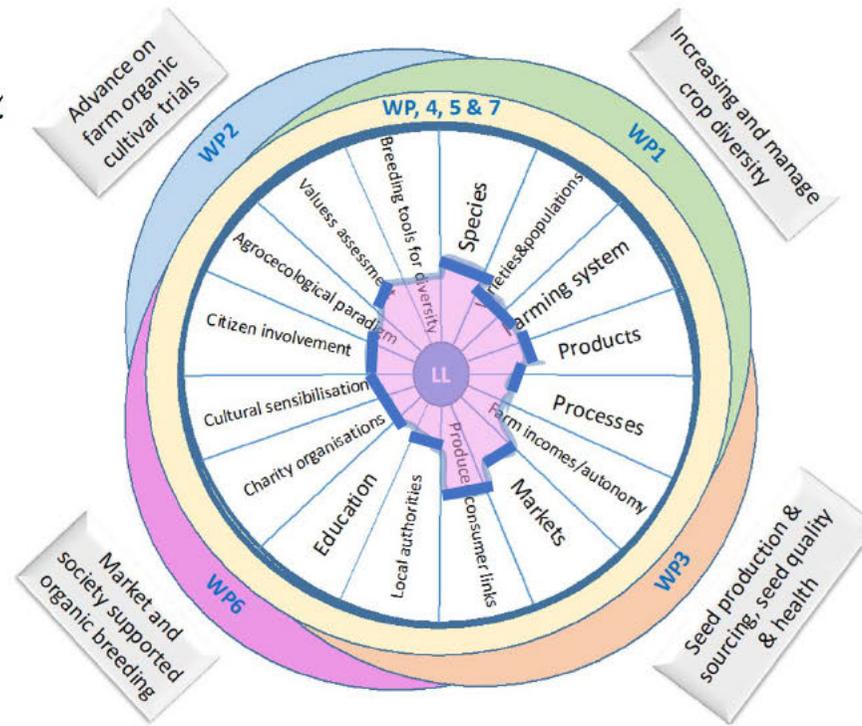
# 17 Living Labs (from farm to fork)



Innovations are co-created and validated in real world scenarios in different climatic and socio-economic and cultural context in Europe

# Cross fertilisation among Living Labs for developing market & society supported organic breeding

- **17 Living Labs** representing a diversity of European agroecosystems, breeding approaches, and value chains.
- They offer the forum where actors involved in organic breeding at different stages of the innovation process will be mobilised by partners and engaged through appropriate methods in participatory co-creation processes in the organic seed sector.
- **Each LL will integrate different segments of the project's activities** into real-world settings that will be specific to their uni



# Pathway to impact

## PUSH – PULL – ENABLE



### Goal

high quality organic seed  
of sufficient quantity  
adjusted to organic  
agriculture for  
diverse diets and  
sustainable food systems



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**ECO-PB**

**CPVO**  
Community Plant Variety Office

**Seed regulation,  
NGT regulation**

**EU Strategies**

**City food  
policy**

**UN Sustainable  
Development  
Goals**

# PUSH – PULL – ENABLE approach

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- the entire **market** is observed with the aim of generating long-term solutions for increasing the amount of organic seeds in the EU
- **PUSH** increases the availability of organic seeds of cultivars suitable for organic production
- **PULL** increases and stabilizes the market demand for organic seeds of cultivars suitable for organic production
- **ENABLE** accelerates and encourages the legislative and regulatory environment to adapt to supply and demand

# Involving citizens and cities for increasing organic seed use

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## Local (Valencia ES, Rennes FR, Sandicci IT, Geneva CH) and global Level:

- *Cultivated biodiversity in urban food systems: **collecting proposals** from the community for the MUFPP and local governments.* October 2022, LLD Forum Budapest
- ***Enhance cultivated biodiversity in local food policies.*** October 2023, LLD Forum Dublin
- *Proposal EUROPEAN SYMPOSIUM "**CULTIVATED BIODIVERSITY AND CITIES. Local tools to accelerate food systems committed to agroecology**".* València EU Green Capital, spring 2024. VLC, FAO, ITPGRFA, MUFPP
- Agreement **Milano Urban Food Policy Pact (MUFPP)** to use outcomes to feed the update of MUFPP recommendations that will be published in 2025
  - Manual about integrating organic seeds and breeding in local sustainable and healthy food policies (M34)

# Increase awareness of organic breeding benefits for the society and environment: activities carried out Y1

- Selection of two focus cases:
  - **Organic heterogeneous material (OHM)** by **Rete Semi Rurali**; Crop: **Wheat**; Product: Bread; Value chain region: **Tuscany (Italy)**.
  - **Organic variety (OV)** by **Bingenheimer Saatgut**; Crop: **Beetroot**; Product: Beetroot juice; Value chain region: **Baden-Württemberg (Germany)**.
- **OHM wheat**, Rete Semi Rurali:
  - Semi-structured interviews with supply chain actors at “coltiviamo la diversità – Floriddia farm\*” to identify the economic, social, and environmental benefits of organic heterogeneous material.
  - Next step: Analysis of interviews.
- **OV red beet**, Bingenheimer Saatgut:
  - Supply chain actors identified together with Bingenheimer Saatgut and Bioverita.
  - Next step: Semi-structured interviews with supply chain actors – online.

\* <https://rsr.bio/coltiviamo-la-diversita/>



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# Contact information

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## Follow LiveSeeding on:



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