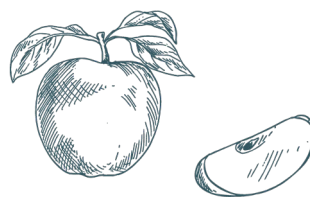
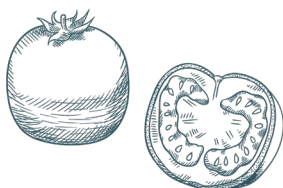




# LIVSEED

Boosting organic seed and plant  
breeding across Europe  
2017 - 2021



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.



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LIVESEED in a nutshell



Aiming for 100% organic  
seed of adapted cultivars



Approach & impact

# LIVESEED in a nutshell

- Budget: 7.4 M EUR EU funding & 1.5 M EUR Swiss funding
- Duration: 4 years
- Coordinator: IFOAM EU
- Scientific coordinator: FiBL (Switzerland)
- Goal: **Boosting organic seed and plant breeding in order to improve the performance, sustainability and competitiveness of the organic sector**
- Approach:
  - Inter- and transdisciplinary
  - Policy – economy – science interface
  - Multi-actor & stakeholder involvement
  - Wide geographic representation



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# Working together



**49 partners**  
**18 countries**

23 breeding & research  
institutes

7 breeding companies

8 seed companies

11 organic associations



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# Aim: 100% organic seed of adapted cultivars by 2037

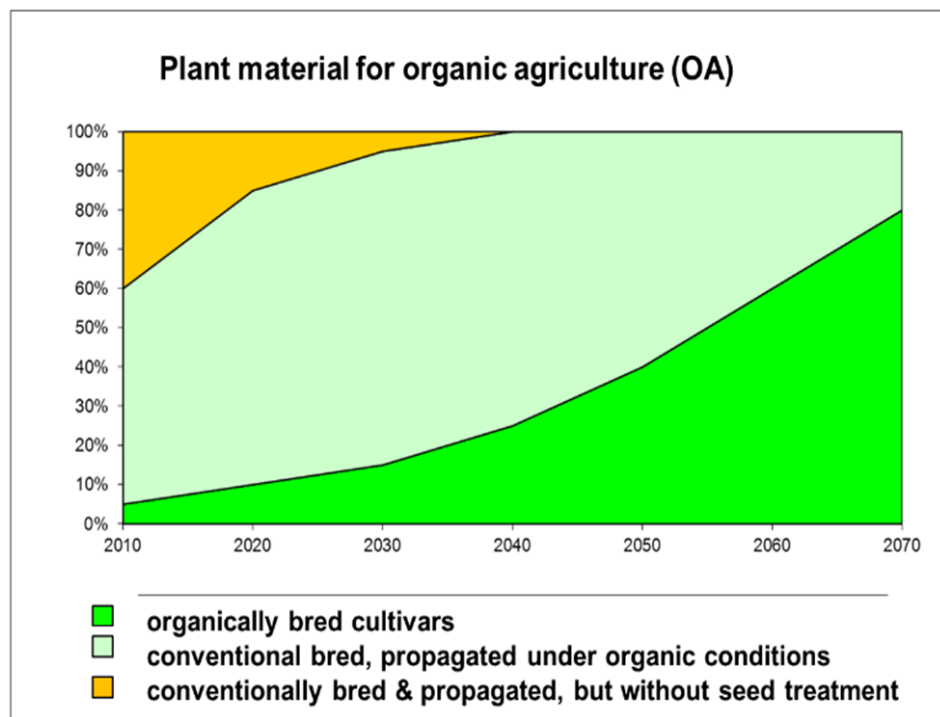


Figure 1 : Schematic time line to reach the goal of 100% organically propagated seed of suitable cultivars (light green) in short term and to foster cultivars specifically bred for organic farming systems (bright green) in the long term

# Main objectives



## **Policy & regulation**

Provide a level playing field for the use of organic seed and variety registration across Europe

## **Research & development**

Develop innovative approaches in organic plant breeding and improve quality of organic seeds

## **Socio-economics**

Increase access to organic seed and promote use of adapted cultivars

## **Economy & market**

Improve the competitiveness of the organic seed supply chain

## **Communication & network**

Enhance knowledge exchange & rise awareness on the benefits of organic seed and plant breeding



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# LIVESEED ambitions

- 1. Co-development of knowledge by transdisciplinary multi-actor approach
- 2. Holistic approaches for breeding and seed production
  - Plant – Plant interaction
  - Plant – Soil microbiome interaction
  - Plant – Seed microbiome interaction
- 3. Enabling more sustainable food production systems
  - Mitigate risks of crop failure through breeding for diversity
  - Safeguard genetic resources for future generations

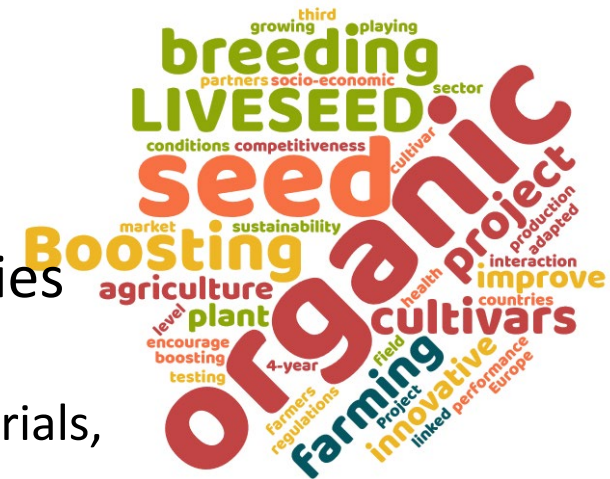


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# LIVESEED ambitions

- 1. Co-development of knowledge by transdisciplinary multi-actor approach (farmers, breeders, scientists, seed registration staff, retailers, ministry staff, consumers/society)
  - Breeding activities themselves
  - Development of new breeding methodologies and approaches
    - Conventional materials and... Heterogeneous materials, mixed populations, composite cross populations, ....
  - Events and workshops (e.g. gen. public, **national visits**)



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# LIVESEED ambitions

- 2. Holistic approaches for breeding and seed production
  - Plant – Plant interaction
    - e.g. Intercropping Agroforestry (trials and studies)
  - Plant – Soil microbiome interaction
    - e.g. Microorganisms populations depending on the species, intercrops, etc. e.g. Peas, maize
  - Plant – Seed microbiome interaction
    - e.g. Effect of the microbiome in seed germination and vigour, differences in microbiome depending on the origin of seeds, etc.



# LIVESEED ambitions

- 3. Enabling more sustainable food production systems
  - Mitigate risks of crop failure through breeding for diversity
    - i) a range of species,
    - ii) intraspecific variation,
    - iii) heterogeneous materials and populations,
    - iv) intercropping, agroforestry, crop rotation, etc.
    - v) including small organic initiatives/farmers and breeders
  - Safeguard genetic resources for future generations

As a consequence of the latter...



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# Crop categories

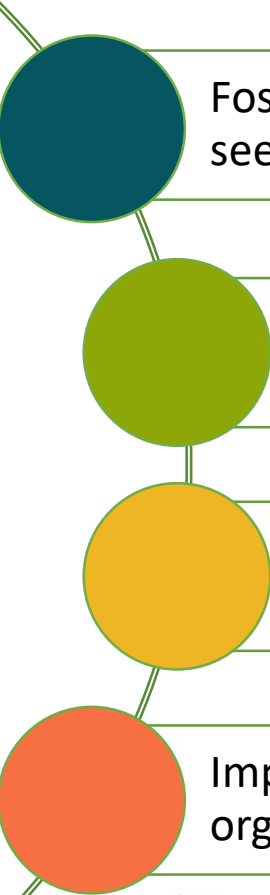
Research activities of LIVESEED will cover five main crop categories:

- Legumes (lupin)
  - Vegetables (carrot, tomato, broccoli)
  - Fruit trees (apple)
  - Cereals (winter wheat)
  - Fodder crops (grasses)
- considering different farming systems (mixed cropping, agroforestry) pedoclimatic zones across Europe



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# What LIVESEED will do:



Foster harmonised implementation of the EU organic regulation on organic seed. Strengthen organic seed databases in the whole EU.

Widen the choice of organic cultivars meeting the demand of farmers, processors, retailers and consumers

Investigate socio-economic aspects related to production and use of organic seed

Improve availability and quality of organic seed. Develop guidelines for organic cultivar testing and registration



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# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- White lupin (legume)
- Brassica (vegetable)
- Apple (fruit trees)
- Winter wheat (cereals)
- Tomato (vegetable)



Specific “GAPS-TO-BE-FILLED”

# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- White lupin (legume)



Great potential as super-food (high protein) and feed crop

But... Anthracnose and abiotic stress (calcium soils)

And... narrow genetic base limited to sweet (low alkaloid) genotypes

ONGOING: collaborative breeding with European and other breeding companies. CCPs, phenotyping for resistances and quality + GBS



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# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- Brassica: broccoli, cauliflower, cabbages, kolhrabi



High concern from organic consumers (and retailers) about cell fusion-based CMS (and sometimes extended to any CMS...)

Most F1 cell fusion based could be replaced by: F1 SI-based, OP populations or CCPs

ONGOING: collaborative breeding with several european breeding companies. Adaptation and quality trials in Southern EU countries (e.g. Portugal, Spain, France, Italy).



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# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- Appel



Difficulties under organic. E.g. too much needing of copper  
Not efficient collaborative network of farmers and breeders

ONGOING:

Development of an active EU network for Apple organic breeding  
Trials for selecting more resilient, not Cu-depending varieties and rootstocks



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# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- Winter wheat



Bottleneck in a seedborne disease in wheat: *Tilletia caries*

ONGOING:

Supporting organic wheat breeders by providing modern breeding tools to improve resistance to several races

Lines derived from CCPs screened on the field + GBS



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# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- Tomato



Breeding for organic in tomato very weak and low diversity

ONGOING:

Spain and Italy breeding activities from different approaches

Network: scientists + small farmers + retailers + consumers

Different locations/agroclimatic conditions (5 Spain, 6 Italy)

Wide collections of landraces + CCPs + MAGIC evaluated in PPB



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# WP3 -Task 3.4 (as a case study)

*“Supporting small existing breeding initiatives&initiating new collaborations to close gaps in various crops”*

- Tomato





# Your involvement

## Follow our activities on



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



## Participate in:

- Surveys
- Interviews
- Workshops
- Events



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# LIVESEED

**IFOAM**  
EU GROUP  
MAKING EUROPE  
MORE ORGANIC

**FiBL**  
Switzerland

**AEGILOPS**  
Genetic Networks for Biodiversity  
and Ecology in Agriculture

**AGES**

 Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra  
  
Swiss Confederation

Federal Department of Economic Affairs,  
Education and Research EAER  
**Agroscope**

 **Agrologica**  
Plant breeding  
and research

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Agricultural Resources  
and Economics

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VIVAS**

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 **Vitalis**  
Organic Seeds

 **UNIVERSITAT  
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DE VALÈNCIA**



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