



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

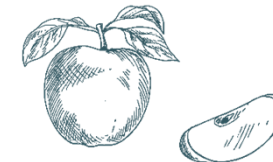
**FiBL**

# LIVESEED



## Boosting organic seed and Plant breeding across Europe 2017-2021

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CPVO MEO

4<sup>th</sup> December 2019 Angers



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: 100% organic seed of adapted cultivars

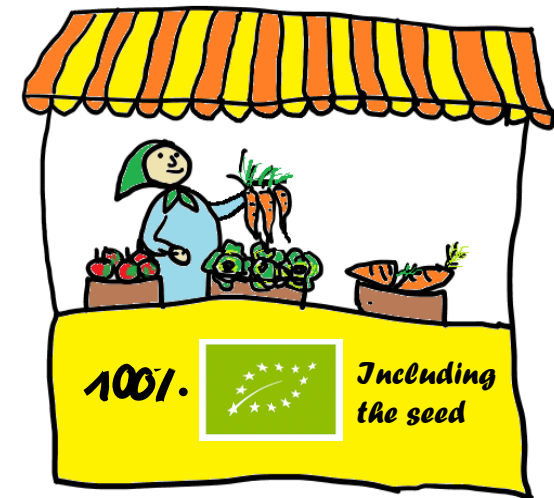
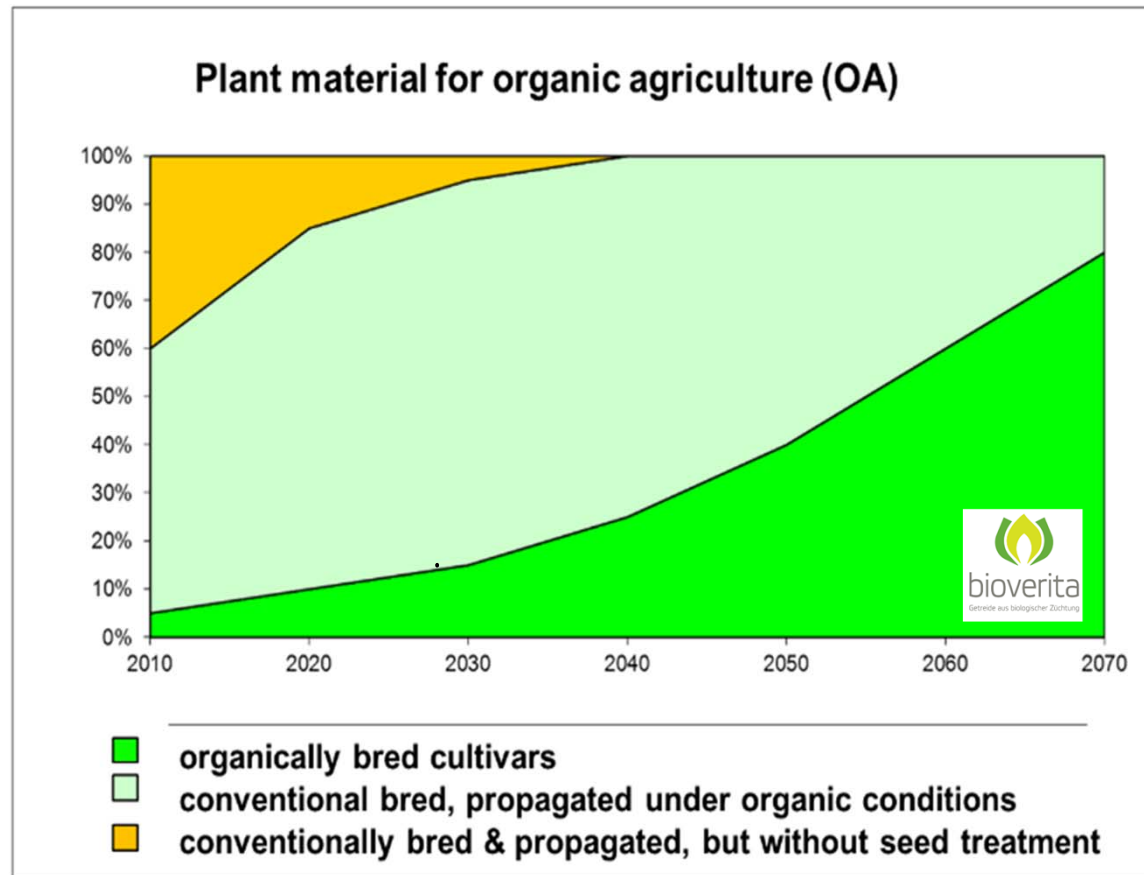
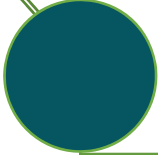
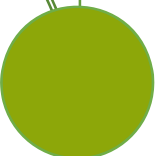
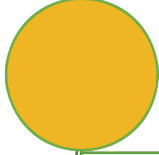
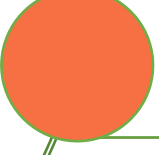
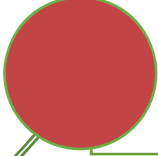


Figure 1 : Schematic time line to reach the goal of 100% organically propagated seed of suitable cultivars (light green) in short term and to foster cultivars specifically bred for organic farming systems (bright green) in the long term

# Main objectives

-  **Policy & regulation**  
Provide a level playing field for the use of organic seed and variety registration across Europe
-  **Research & development**  
Innovative approaches in organic plant breeding and improve quality of organic seeds
-  **Socio-economics**  
Increase accesability of organic seed and adoption of new cultivars
-  **Economy & market**  
Improve the competitiveness of the organic seed supply chain
-  **Communication & network**  
Enhance knowledge & rise awareness on the benefits of organic plant breeding and seed

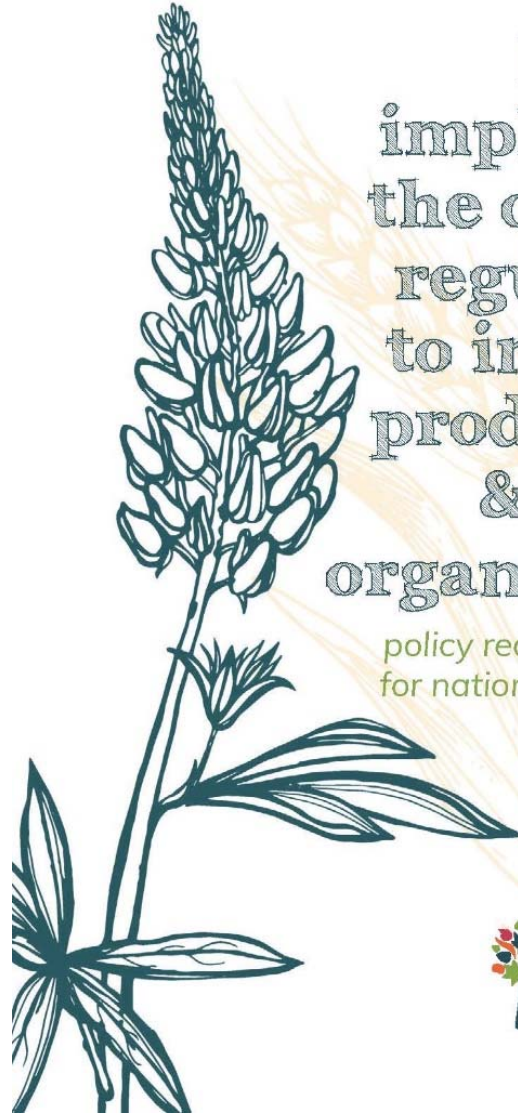
# WP1 Regulation & Policy Framework on organic seed

- National visits of competent authorities for implementing organic regulation with respect to seed followed by national stakeholder workshops in 10 countries
  - Organic seed database
  - Derogations for untreated conventional seed
  - Measures to improve organic seed production and use (expert working groups, national list with crops without derogation, incentives for farmers, seed producers, stricter implementation of organic regulation, phasing out of derogation in new Organic regulation, seed declaration)
- Booklet on implementing organic regulation
- Seed supplier survey to assess status quo of production of organic seed and bottlenecks
- Farmer survey to explore reasons why farmers use or not use organic seed
- Development of an EU router seed database
- Recommendations how to improve reporting to EU

# Political Framework

## New organic regulation put into force January 2021

- Phasing out of derogations to the use of non-organic plant reproductive material latest by 2036
- Regular update of national organic seed database
- In 2026 report on the availability of organic seed and reasons of a possible limited access of organic operators
- LIVESEED assessed present derogation reports, national organic seed database, and estimated use of **organic seed across Europe** and collected best practice for policy implementation from different countries [www.liveseed.eu](http://www.liveseed.eu) > tools > booklets
- Recommendations to improve implementation of organic seed use [www.liveseed.eu](http://www.liveseed.eu) > Results > WP1 > **D1.9 report on political obstacles**
- Developmet of a **EU wide router-database** with interface to national databases



# How to implement the organic regulation to increase production & use of organic seed

policy recommendations  
for national and regional  
authorities

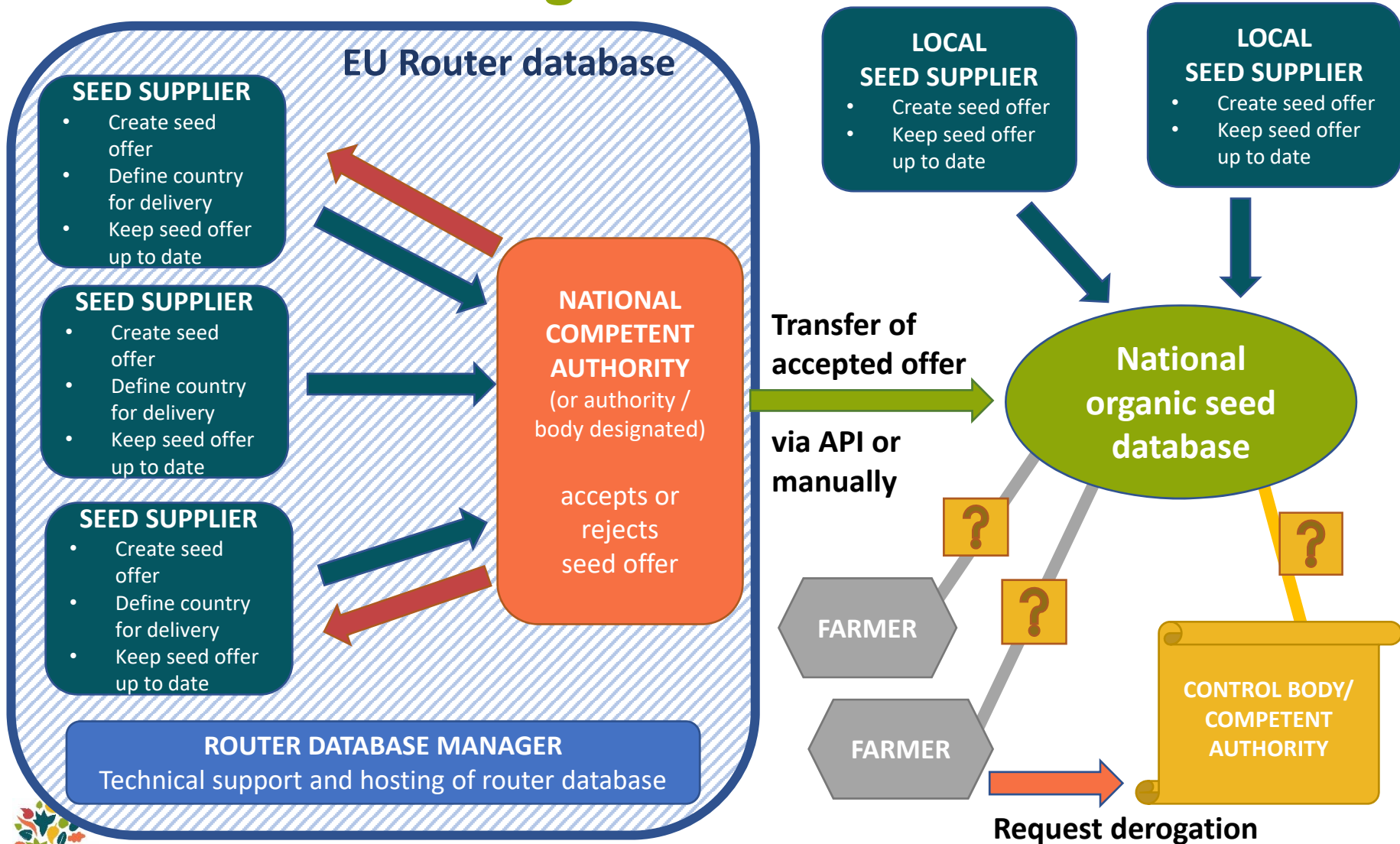


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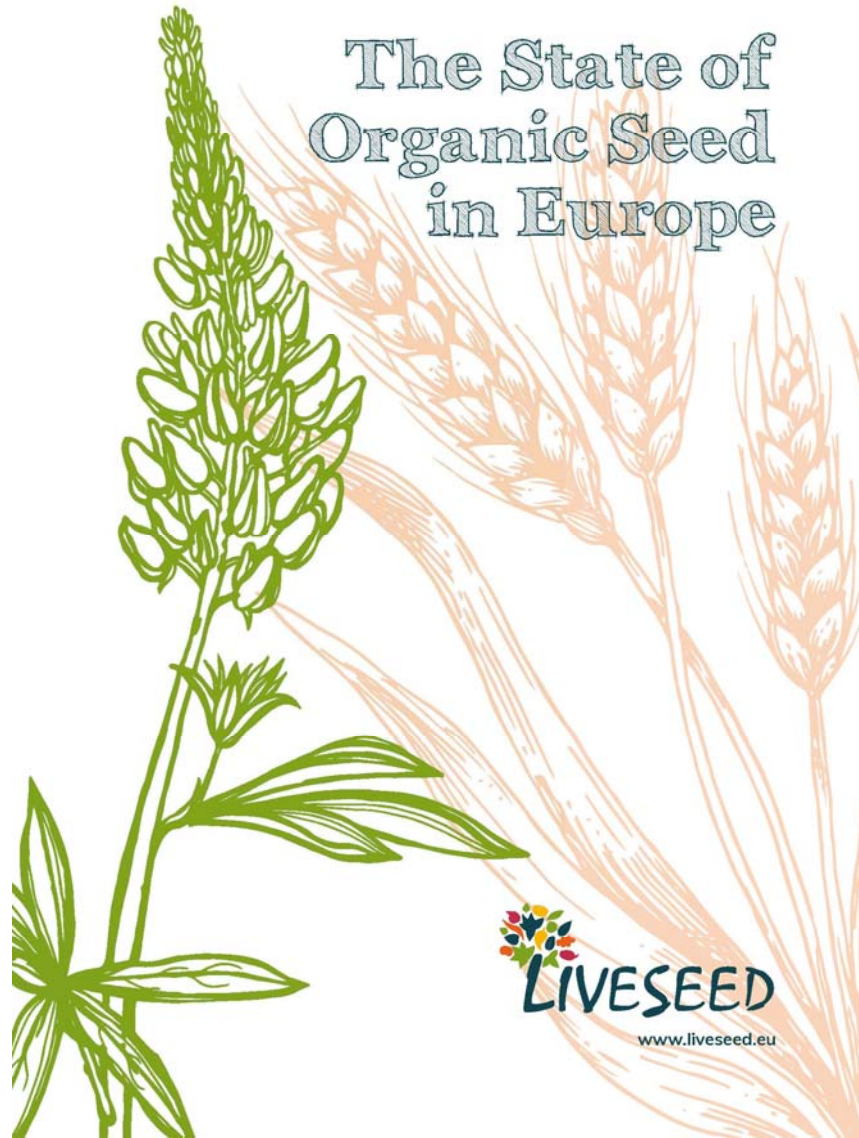
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<https://www.liveseed.eu/wp-content/uploads/2019/07/LIVESEED-FinalV2-WebInteractive-1.pdf>

# Aim of LIVESEED: Develop a EU-router database to link national organic seed databases



# The State of Organic Seed in Europe



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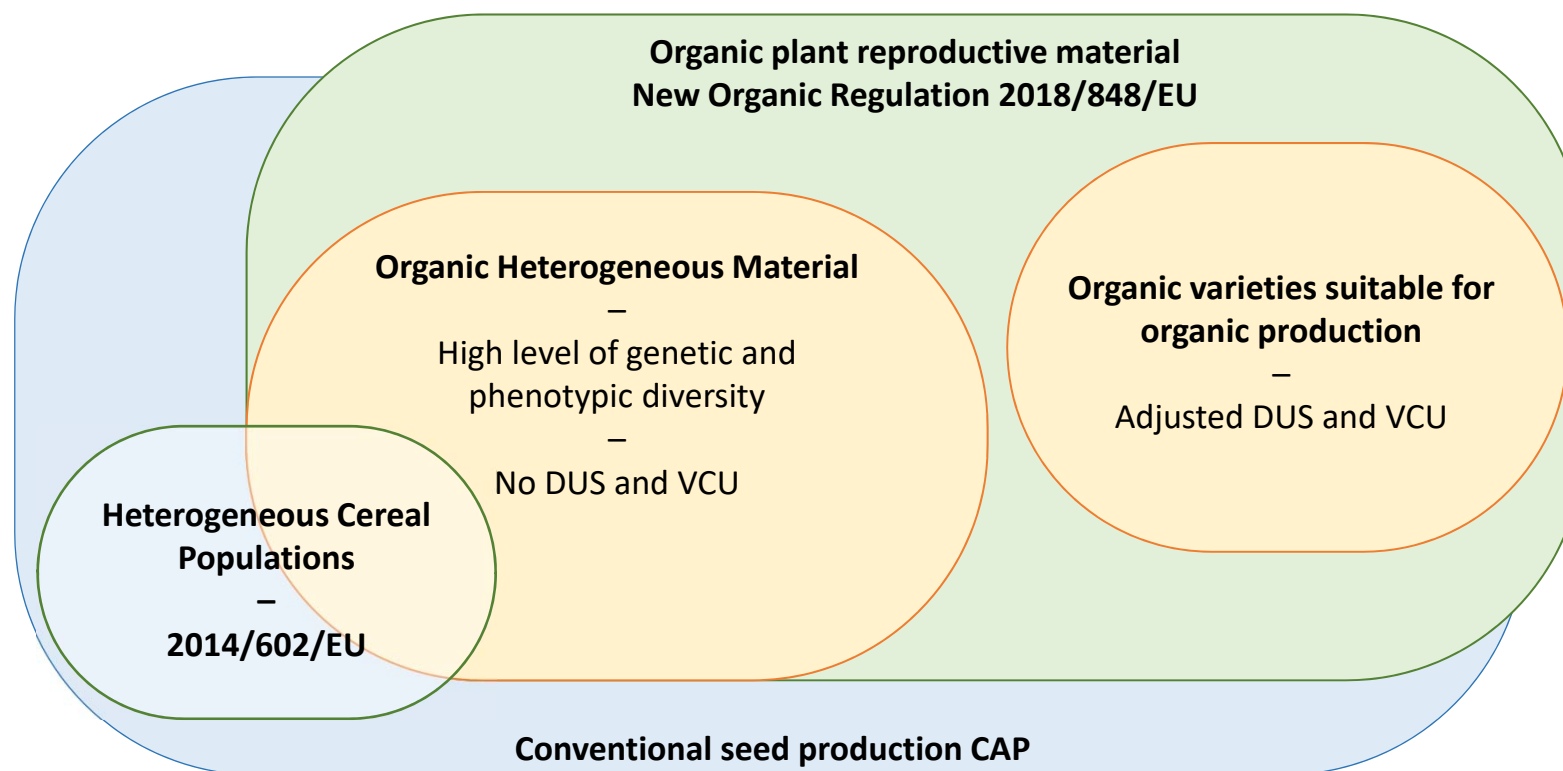


# Political Framework

## New organic regulation put into force January 2021

- Definition of organic heterogeneous material and their use in organic farming for all crops
  - Only notification, no DUS or VCU, no seed certification
  - Broader definition compared to temporary experiment
  - development of delegated acts for organic heterogeneous material presently ongoing
- LIVESEED analysed running experiment on marketing heterogeneous populations of cereals and developed toolbox for characterization and description of organic heterogeneous material
- [www.liveseed.eu](http://www.liveseed.eu) > Results > WP2 > Milestone 2.8 Main outcomes and SWOT of experiences from marketing populations under the Temporary Experiment into the commercialization of heterogeneous populations
- **Deliverable 2.8: Proposal for a toolbox** for identification and description of organic heterogeneous material finalized by December

# New definitions with new organic regulation, put into force January 2021



- Definition of organic plant breeding
- Definition of organic heterogeneous material and their use in organic farming for all crops
- See **Liveseed Milestone Report M2.8** ‘Main outcomes and SWOT of experiences from marketing populations under the Temporary Experiment into the commercialisation of heterogeneous populations in the European Union’ for an **update on 2014/602/EU**

[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP2

# Characterisation of heterogeneous populations

Identification (Art. 5)	Population authorisation (Art. 7)
	Species and denomination
Parent germplasm	Breeding objective(s) Breeding and production methods (selection)
Breeding scheme	
Region of production	
Degree of heterogeneity	Description of how the population was generated e.g. 5 parent CCP
Characteristics (trial results)	Characteristics (trial results)
	Representative sample
	Applicant details and declaration

# Common requirements for OHM

- All crop species can be OHM
- Production of OHM means development (human and/or natural selection) **under certified organic conditions for at least 3 years.** Evidence and traceability is provided via organic certification
- Breeding methods should comply with organic principles (at least respect to natural crossing barriers)
- Simple notification procedure in collaboration with national authorities
- No intellectual property rights
- Production of plant reproductive material (PRM) (seed multiplication) of OHM should also be conducted under certified organic agriculture
- Seed health and quality parameters should be defined (germination, disease etc.)
- No quantity restriction
- Truthful labelling throughout

# Common requirements for OHM

## Tools vary for different types of OHM

- **FARMER SELECTIONS:** selection by a farmer from a population or landrace. They have a lot of genetic and phenotypic diversity so do not comply with DUS.

Open list of elements to consider in order to describe 'farmers selection':

- Origin
- Region of development

- Phenotypic traits
- Traceability
- Breeding conditions and location

- **DYNAMIC POPULATIONS:** developed from a mixture of large numbers of breeding lines and cultivars (understood in a broader sense than officially released varieties, landraces, less homogeneous populations, niche varieties...) cultivated together and seed saved. After a few generations, the mixtures outcross and adapt to local conditions. The process is important for the definition.

Open list of elements to consider in order to describe 'dynamic population':

- Parents
- Breeding process
- Phenotypic traits when

- possible
- Traceability
- Breeding conditions and location
- Breeding objective

- **Composite Cross Populations (CCPs):** the result of targeted crosses that are then left to evolve together under natural conditions. This category is different from synthetic varieties/populations which are reconstructed to be stable.

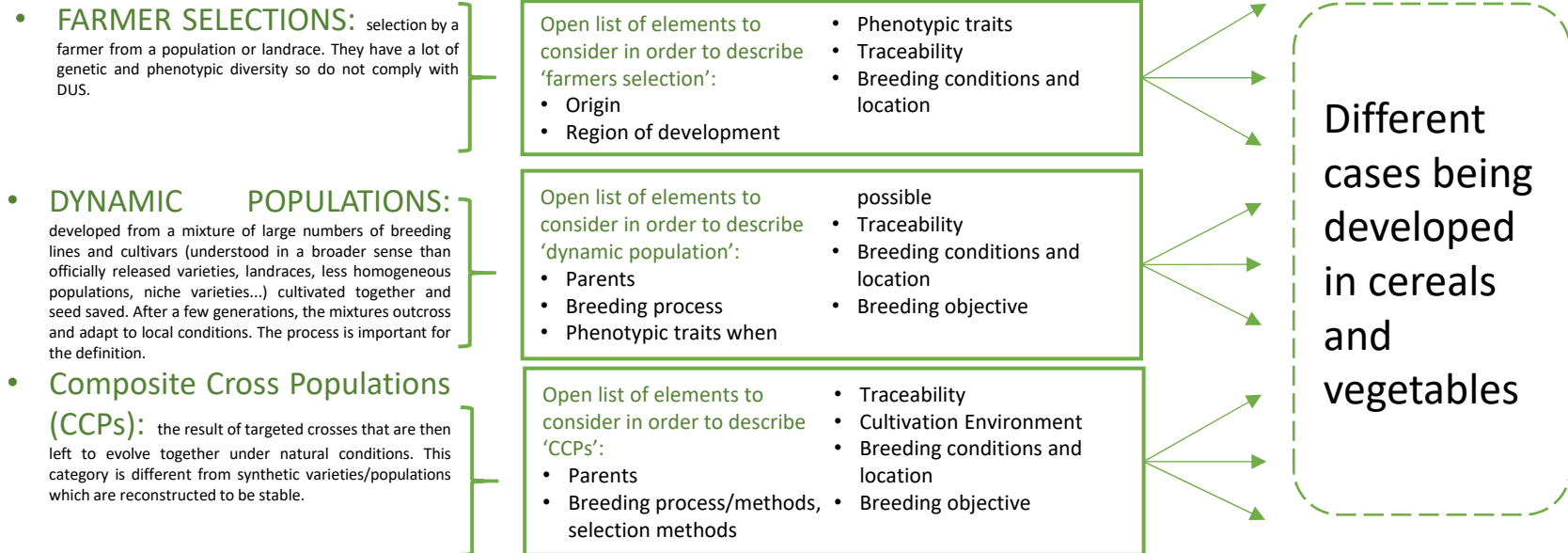
Open list of elements to consider in order to describe 'CCPs':

- Parents
- Breeding process/methods, selection methods

- Traceability
- Cultivation Environment
- Breeding conditions and location
- Breeding objective

# Toolbox for description of different types of OHM

## Tools vary for different types of OHM



**Common characteristics - requirements**

- Production of OHM means a minimum of 3 and 5 years, for annual and biennial/perennial crops respectively, of development (human and/or natural selection) under certified organic conditions (it is a minimum to have material adapted to OA and to have tools for traceability)
- Production of plant reproductive material (PRM) (seed multiplication) of OHM should also be conducted under certified organic agriculture.
- Simple notification procedure
- No intellectual property rights
- No quantity restriction
- All crops species can be OHM
- Seed quality requirement should be defined (germination...)
- Truthful labelling
- Breeding methods should comply with organic principles (at least containment within natural crossing barriers)
- Parents should also have been obtained with breeding methods in line with organic principles
- The name of the breeder should be included in the name of the OHM (ex. OHM Rouge de Bordeaux from X)

# Examples of OHM in vegetables

- Germany
  - Lettuce (self pollinating species) started 6-7 years ago to develop populations with higher tolerance to fungal diseases
  - Tomato (self pollinating species) started 2 years ago against main disease caused by Cladosporium
- Netherlands
  - Spinach (outcrossing species) started crosses in 2018 to develop OHM to achieve longer lasting mildew tolerance and general higher level of resistance
- UK
  - Sweet pepper: broad selection in sweet pepper landrace for improved adaptability in UK
- Other cases to start up

# Political Framework

## New organic regulation put into force January 2021

- Definition of organic plant breeding included
- Temporary experiment 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 (2021 up to 2027)
  - The experiment should start in Mid 2021
  - Implementing act for the upcoming temporary experiment will be developed in 2020

→ 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



# Organic variety trials

Parameters	Survey among 15 European Countries
Complexity of trials	From simple trials with few repetitions to randomised block designs with several repetitions
Locations	On-station or on-farm trials, 1-40 locations in extensive networks
Trial protocols	Different levels of assessments for organic traits
Assessments	Done by farmers, researchers, advisors, trial technicians
Plant material	Pre-release, post-registration and under registration in supplementary VCU-trials
Choice of varieties	Expert groups with several actors, or combinations of researchers, breeders, seed companies, farmers, advisors
Dissemination	From dissemination in closed groups to public available online results
Funding	Public funding, projects, applicant fee, membership fee, voluntary work

# New organic regulation 2018/848 (from 01.01.2021)

## Preface

(39) In order to meet the needs of organic producers, to foster research and to **develop organic varieties suitable for organic production**, taking into account the specific needs and objectives of organic agriculture such as enhanced genetic diversity, disease resistance or tolerance and adaptation to diverse local soil and climate conditions, **a temporary experiment** should be organised .... for a term of seven years,... It should help to establish the criteria for the description of the characteristics of that material and to determine the production and marketing conditions for that material  
[Start Mid 2021]

# New organic regulation 2018/848 (from 01.01.2021)

## Article 3 – Definitions

(19) ‘**organic variety suitable for organic production**’ means a **variety** as defined in Article 5(2) of Regulation (EC) No 2100/94 which:

(a) is characterised by a high level of genetic and phenotypical diversity between individual reproductive units; and

(b) **results from organic breeding activities** referred to in point 1.8.4 of Part I of Annex II to this Regulation

Annex II: 1.8.4. For the production of organic varieties suitable for organic production, the **organic breeding activities shall be conducted under organic conditions** and shall focus on **enhancement of genetic diversity, reliance on natural reproductive ability, as well as agronomic performance, disease resistance and adaptation to diverse local soil and climate conditions.**

All multiplication practices except meristem culture shall be carried out under certified organic management

## WP2.1.2 Adjusted protocols for the release of organic varieties

- LIVESEED wants to develop guidelines for adjusted protocols for organic DUS and VCU testing for variety release and governance models for post-release testing
  - Start in 2020 with case studies in cooperation with interested Examination offices for adjusted DUS and VCU to test feasibility
  - Prepare in collaboration with CPVO and the INVITE Project Workshop in February 2020 in Brussels
- provide input for implementing acts for temporary experiments on varieties suited for organic agriculture (2021 – 2028)

# Adapted methods to assess DUS

- Proper implementation of DUS for OPV, correct references, own category for testing
- Take more emphasis in D and S instead of Uniformity
- **Restrict the uniformity levels to a minimum required for product quality and use** to allow higher adaptation and yield stability
- Use less parameters for assessment of US
  - restrict to only morphological traits with no effect on yield stability
  - Restrict homogeneity to only xx % of the defined traits
- Accept higher tolerance levels for U
  - Defined standard deviation or frequencies of traits for OPV that allows for certain variability
- Allow more parameters including marker analysis for D

# Proposal for adapted use of characteristics (example *carrots for bundling*)

		relevance of utility for			importance for selection	ECO-PB proposal for adapted protocol	
UPOV Nr.	asterix characteristics	farmers / producers	trade / processors	consumers	organic carrot breeders	Characteristics to be considered mandatory	characteristics to be considered optionally on request (or recommendation) of the applicant
		(0=none, 1=medium, 2=great)				(0=none, 1=medium, 2= great)	
2	Leaf: attitude	2	1	0	1	1	0
4 (*)	Leaf: division	0	1	0	1	0	1
6 (*)	Leaf: anthocyanin coloration of petiole	0	1	0	1	0	1
14 (*)	Root: external colour	1	2	2	2	1	0
17	Root: extent of green colour of skin of shoulder	2	2	2	2	1	0
18	Root: ridging of surface	2	2	1	2	1	0
19 (*)	Root: diameter of core relative to total	0	1	1	2	0	1
22 (*)	Root: colour of cortex	1	2	1	2	1	0
25 (*)	Root: extent of green coloration of interdigital	2	2	2	2	1	0
		<i>characteristics in total:</i>				20	11

31

20 + 11



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

# Adjusted VCU Testing

- Option to test organic bred cultivars under organic farming systems (=target environment)
- Also allow for testing under mixed cropping systems e.g. pea – cereal which is very common in organic agriculture
- Adjusted parameter assessed under organic VCU that reflect specific traits needed in organic farming (e.g. weed competition, seed born diseases, early vigor)
- Seed of all cultivars should be organically propagated to avoid bias due to different seed source (e.g. untreated conventional seed versus organic seed)
- Optional VCU for arable crops for speciality markets (e.g. triticale for breadmaking)

# LIVESEED – ECO-PB – CPVO Workshop

attached to MEA 6th December 2018 in Angers

- Presentation of rational why to work with heterogeneous populations
- Experience for describing heterogeneous populations from CREA
- Overview of survey among 15 countries on set up of organic variety trials
- Adjustment of official release for organic bread varieties for new temporary experiment

[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP5 and WP6 > Conferences and Workshop Material



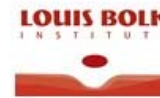
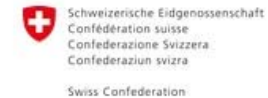




# LIVESEED



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