



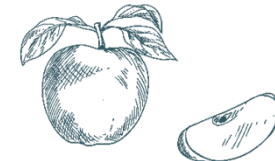
# LIVESEED



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

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

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CPVO AEM

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# Aim: 100% organic seed of adapted cultivars

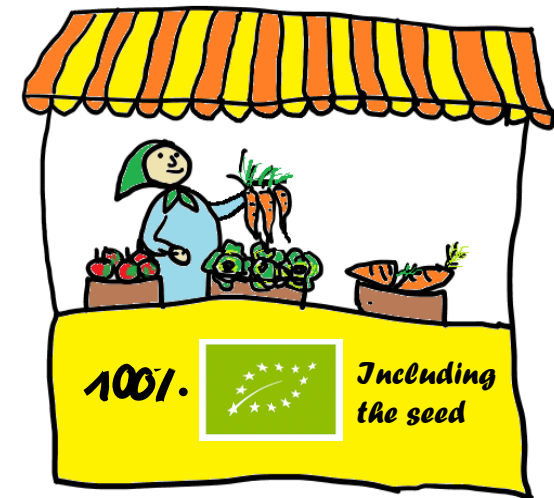
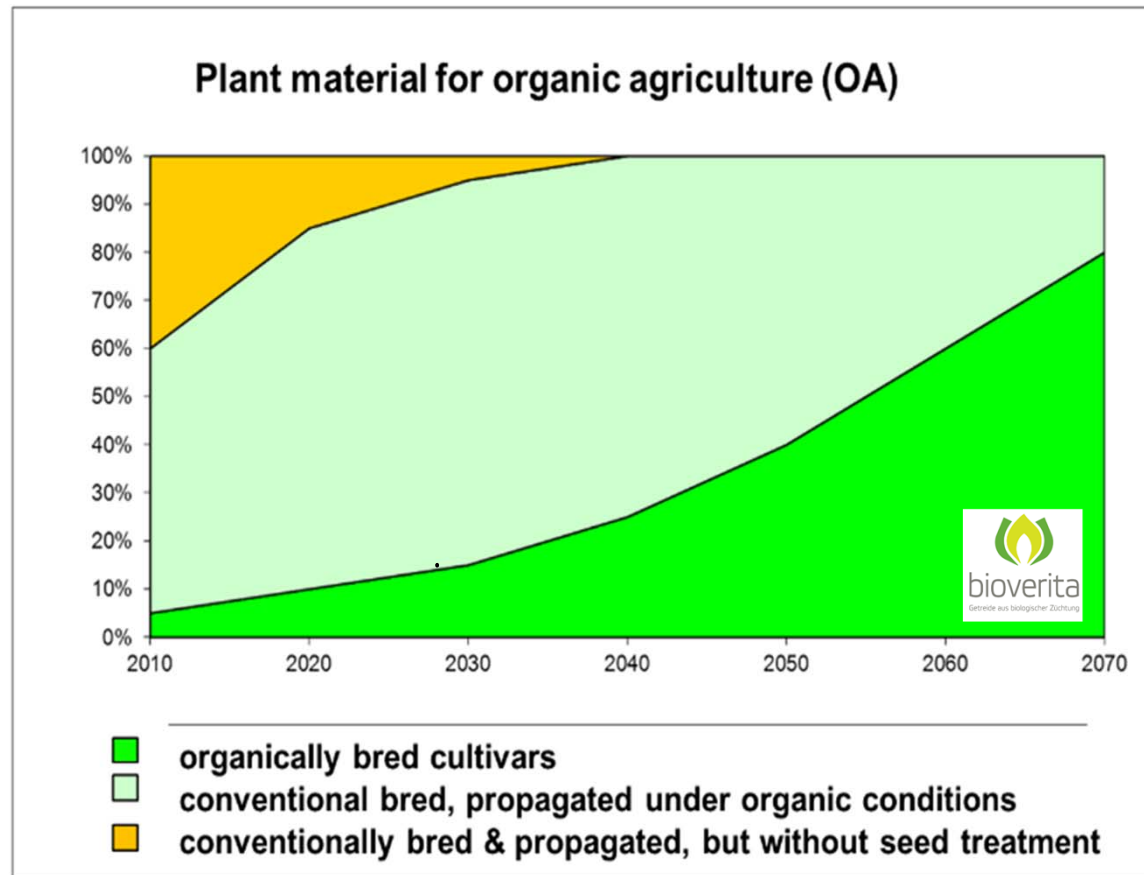
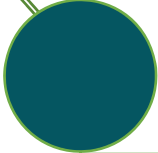
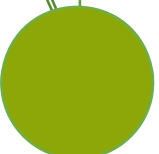
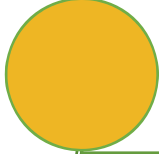
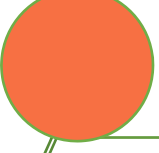
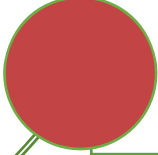


Figure 1 : Schematic time line to reach the goal of 100% organically propagated seed of suitable cultivars (light green) in short term and to foster cultivars specifically bred for organic farming systems (bright green) in the long term

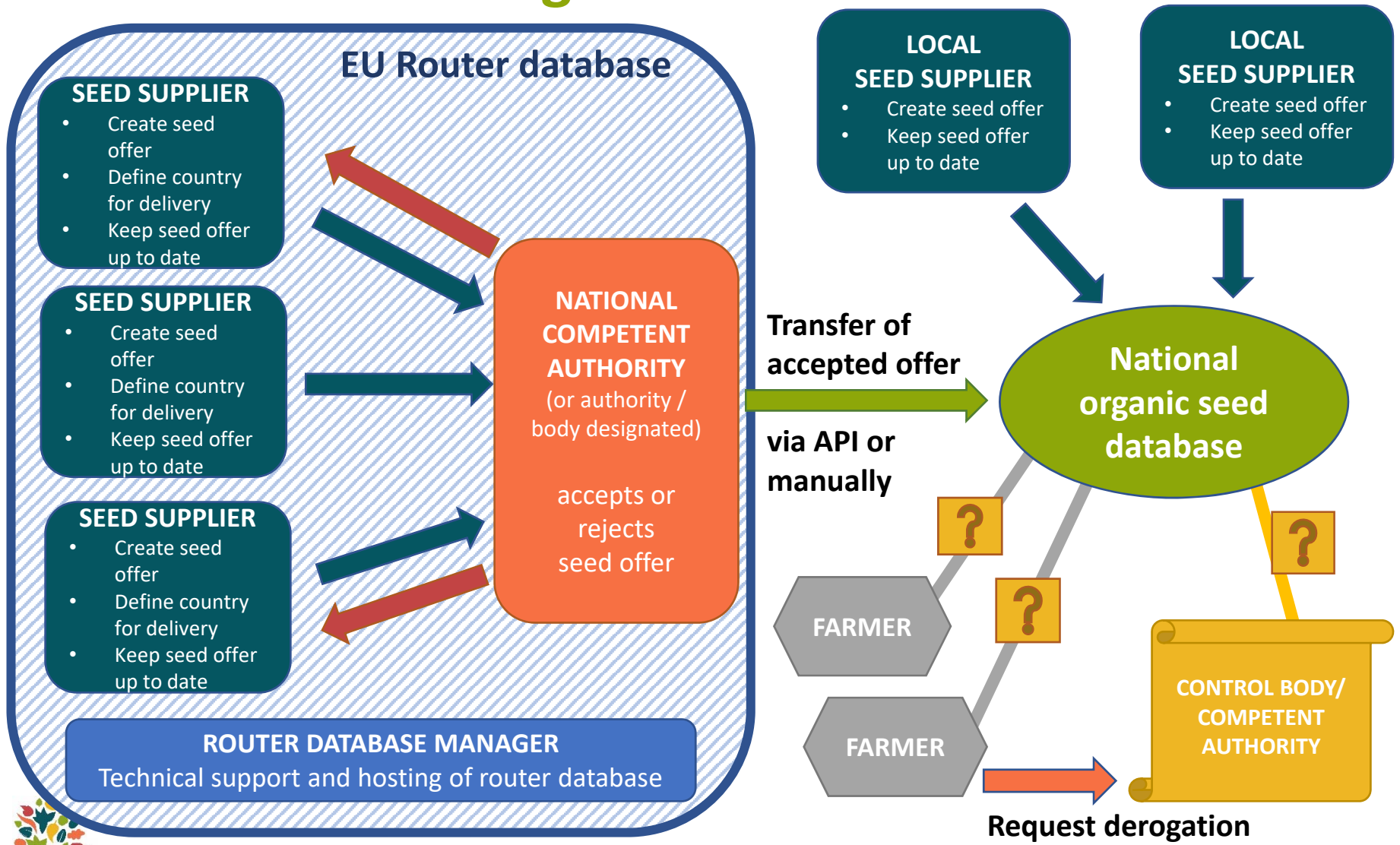
# Main objectives

-  **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

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



# 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
- Definition of organic plant breeding
- Definition of organic heterogeneous material and their use in organic farming for all crops
  - Only notification, no DUS or VCU, no seed certification
  - engage in temporary experiment (prolonged till Feb. 2021)
  - recommendations for the notification of heterogeneous material, description, definition of process, traceability, packaging till end of 2020
- 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

# Political Framework

## New organic regulation put into force January 2021

- 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
  - suggestions to define alternative DUS and VCU testing till end of 2020

# WP2: Improving cultivar testing, seed multiplication & health for high quality seeds

## T2.1: Improve cultivar testing of varieties and populations

- Collection of information on **release (DUS, VCU) and post release variety testing** in different countries including governance and financing models → booklet [www.LIVESEED.eu](http://www.LIVESEED.eu) > Results > WP2
- **On farm cultivar trials** on wheat, barley, faba bean, pulses, potato, carrot, broccoli, tomato, apple in collaboration with WP3 → recommendation for cultivar trials
- **Characterization of heterogenous populations** → exchange with DG Sante working group, CPVO & Examination offices, participation in public workshops → toolbox → proposal for delegated acts of new organic regulation (EU 848/2018) [www.LIVESEED.eu](http://www.LIVESEED.eu) > Results > WP2
- **Adjusted protocols for the release of organically bred cultivars** exchange with DG Sante working group, CPVO & Examination offices case study on kohlrabi, carrots → implementing acts for temporary experiments on varieties suited for organic agriculture (2021 – 2028)



# 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

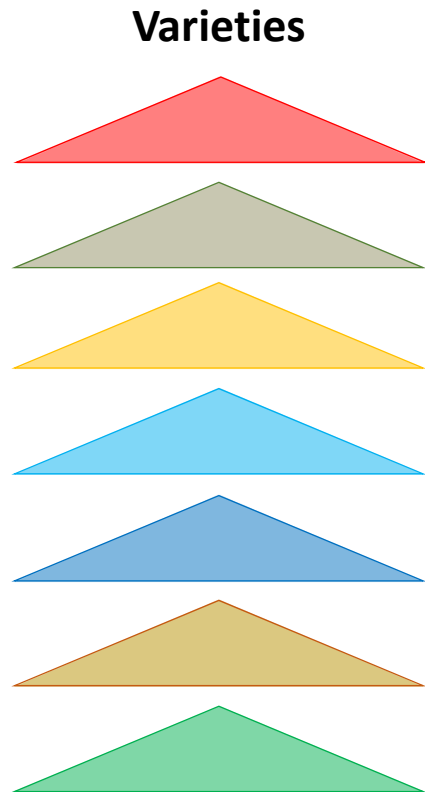
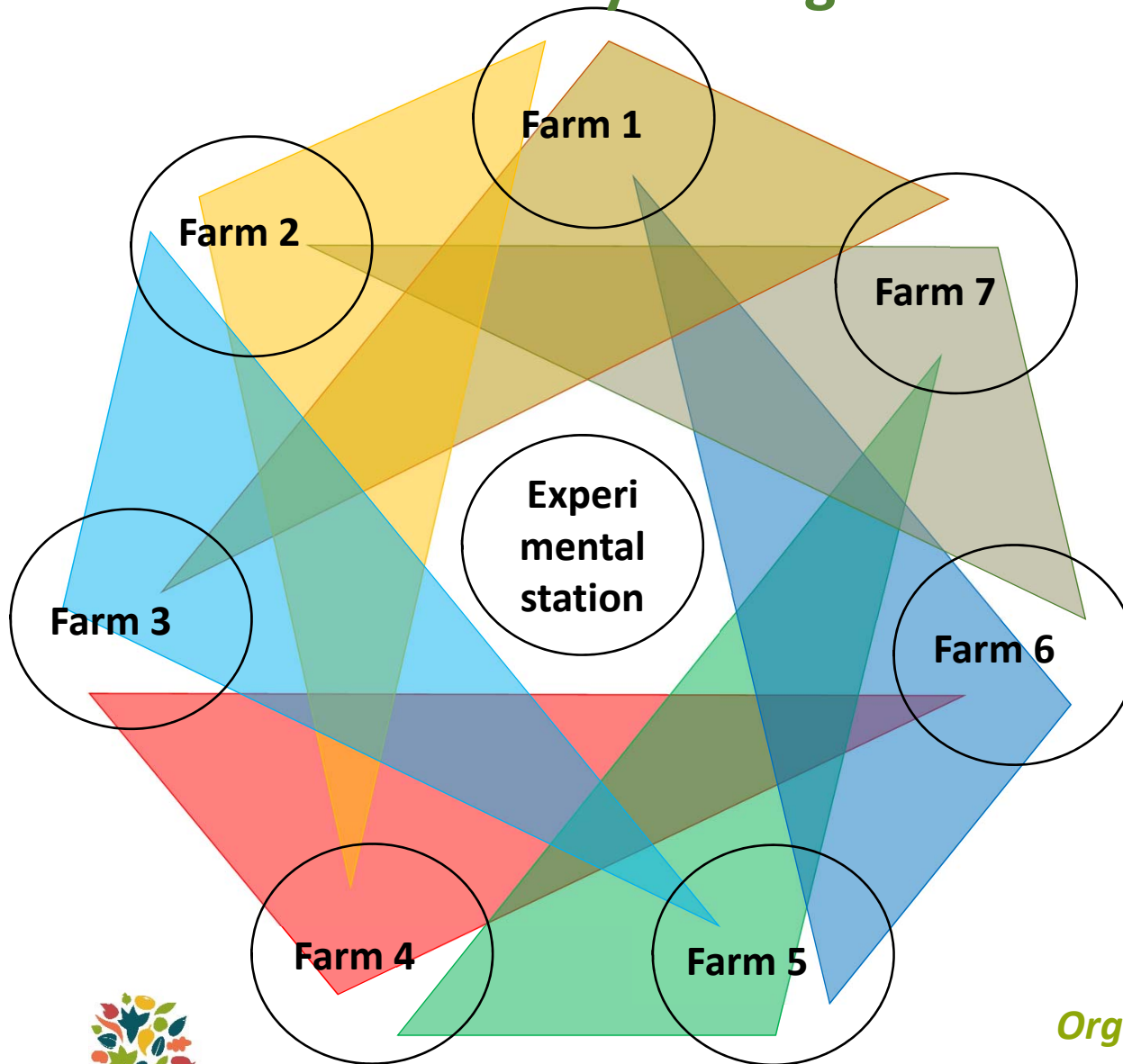
[www.LIVESEED.EU](http://www.LIVESEED.EU) > Results > WP5 and WP6 > Conferences and Workshop Material



# 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

# Decentralised variety testing – Winter Wheat 2017/18



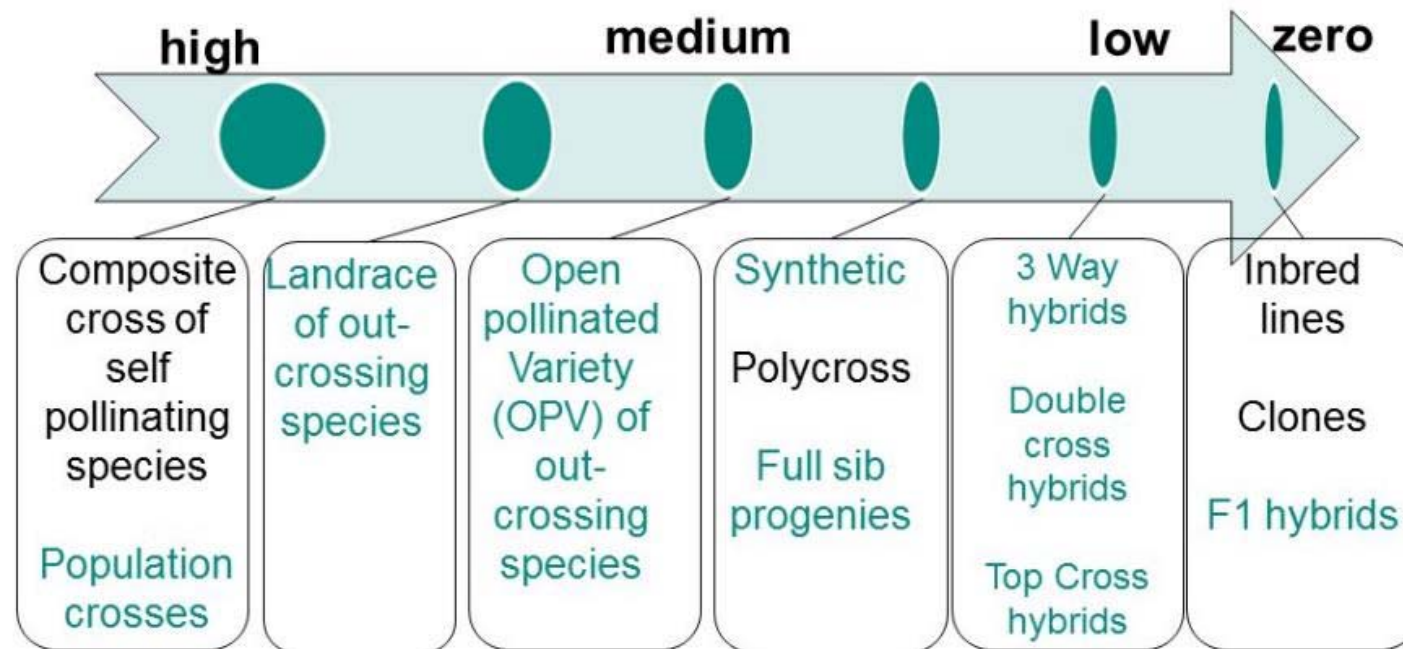
*Organic Research Center, UK*



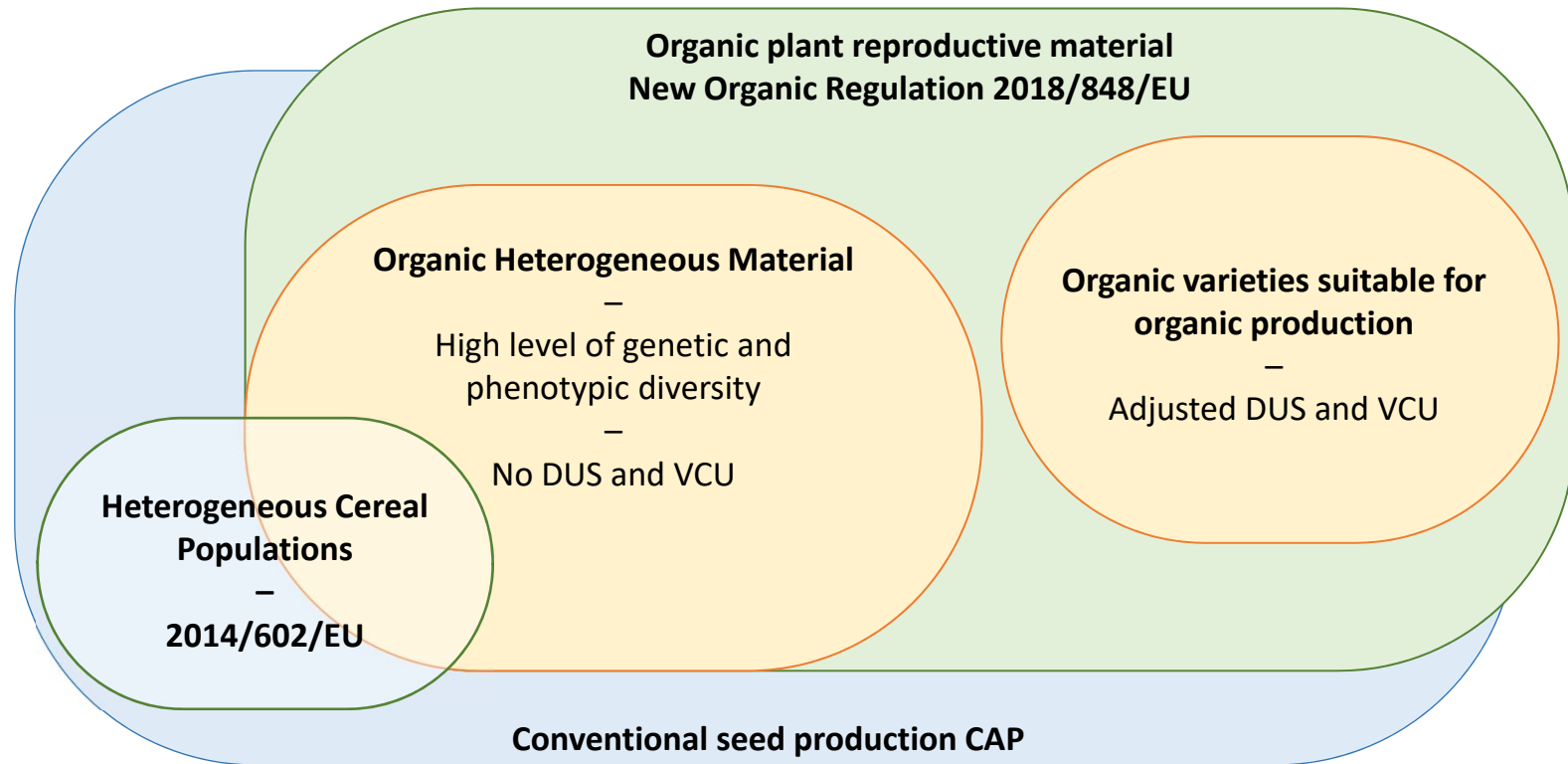
This project received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727230.

# Harnessing diversity

## Genetic diversity within cultivar for different cultivar types



Important to have a wide range of species & cultivar types that are adapted to variable growing conditions and the demands of different value chains



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



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# 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



# Framework under development for **OHM description and identification**

## Tools vary for different types of OHM

- **FARMER SELECTIONS:** single or multiline selection by a farmer from a population or landrace. For a certain period of time and certain region. They have a lot of genetic diversity so do not comply with DUS. This category can cover amateur variety (vegetables), or conservation varieties (cereals) where past records are missing.

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

- Origin
- Region of cultivation

- Phenotypic traits
- Traceability
- Breeding conditions and location

- **DYNAMIC POPULATIONS:** developed from a mixture of landraces or cultivars (understood in a broader sense than officially released varieties, land races, 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 populations which are reconstructed to be stable.

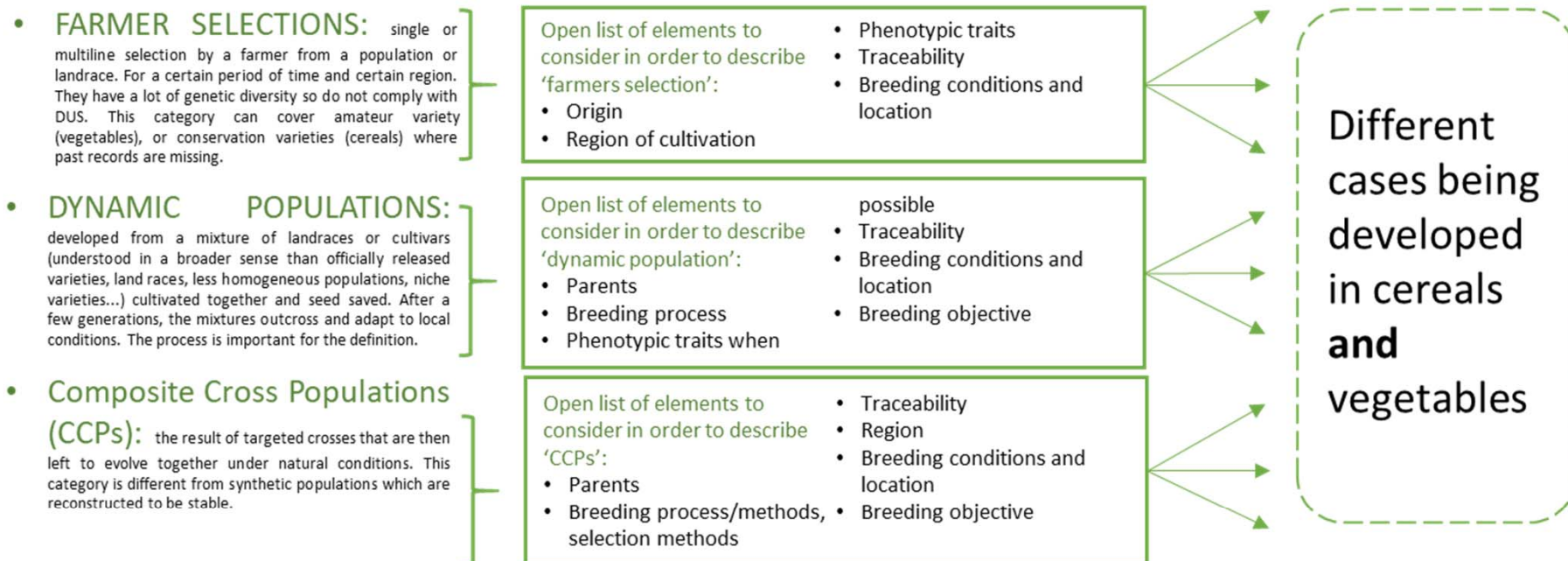
Open list of elements to consider in order to describe 'CCPs':

- Parents
- Breeding process/methods, selection methods

- Traceability
- Region
- Breeding conditions and location
- Breeding objective

# Framework under development for OHM description and identification

## Tools vary for different types of OHM



### Common characteristics - requirements

- Production of OHM means 3 and 5 years, for annual and biennial/perennial crops respectively, of development (human 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 include in the name of the OHM (ex. OHM Rouge de Bordeaux from X)



# Common requirements for OHM

- All crop species can be OHM
- Production of OHM means 3 and 5 years, for annual and biennial/perennial crops respectively, of development (human or natural selection) under certified organic conditions. Evidence is provided via organic certification
- 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
- Simple notification procedure in collaboration with national authorities
- The name of the breeder should be include in the name of the OHM (ex. OHM Rouge de Bordeaux from X)
- 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

# Case 1: Wheat CCP 'ORC Wakelyns Pop.'



**35 populations of wheat, barley or maize have been registered as part of now extended 2014/602/EU...**



# Case 2: Tomato CCP

Starting material: CCP obtained by crossing four local varieties selected for suitability under organic management



		CdB8-Allongée d'Alicante	CdB1-Muchamiel	CdB4-Cuor di bue	CdB3-Cœur de Bœuf
Plant	Country	Spain	Spain	Italy	France
	Cycle	Long	Medium	Short	Medium
	Strength	3	4	1	3
	Fruit Load	5	4	3	2
	Growth	Indeterminatrd	Determinated	Indeterminatrd	Indeterminatrd
Fruit	Other	Regular truss			
	Shape	Rectangular	CdBP c4	CdBP c1	CdBC
	Average Weight	150-190	190-250	190-250	190-250
	Green shoulder	Yes	Yes	Yes	Yes
	Coloration	Red	Light red	Light red	Light red
	Other	Homogeneity	Firmness	Shape	Shape





## Case 2: Tomato CCP

Ongoing research to assess adaptation of same Tomato CCP to different environments and agricultural systems



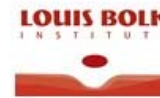
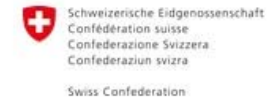




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