IFOAM EU GROUP

FiBL

LIVESEED

www.liveseed.eu

Boosting organic seed and Plant breeding across Europe 2017-2021

Bram Moeskops IFOAM EU, Project Coordinator
Monika Messmer, FiBL-CH, Scientific Coordinator

Monika.Messmer@fibl.org

LIVESEEED-ECOBREED-BRESOV Meeting with policy makers

23rd January 2020 DG AGRI BRUSSELS

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

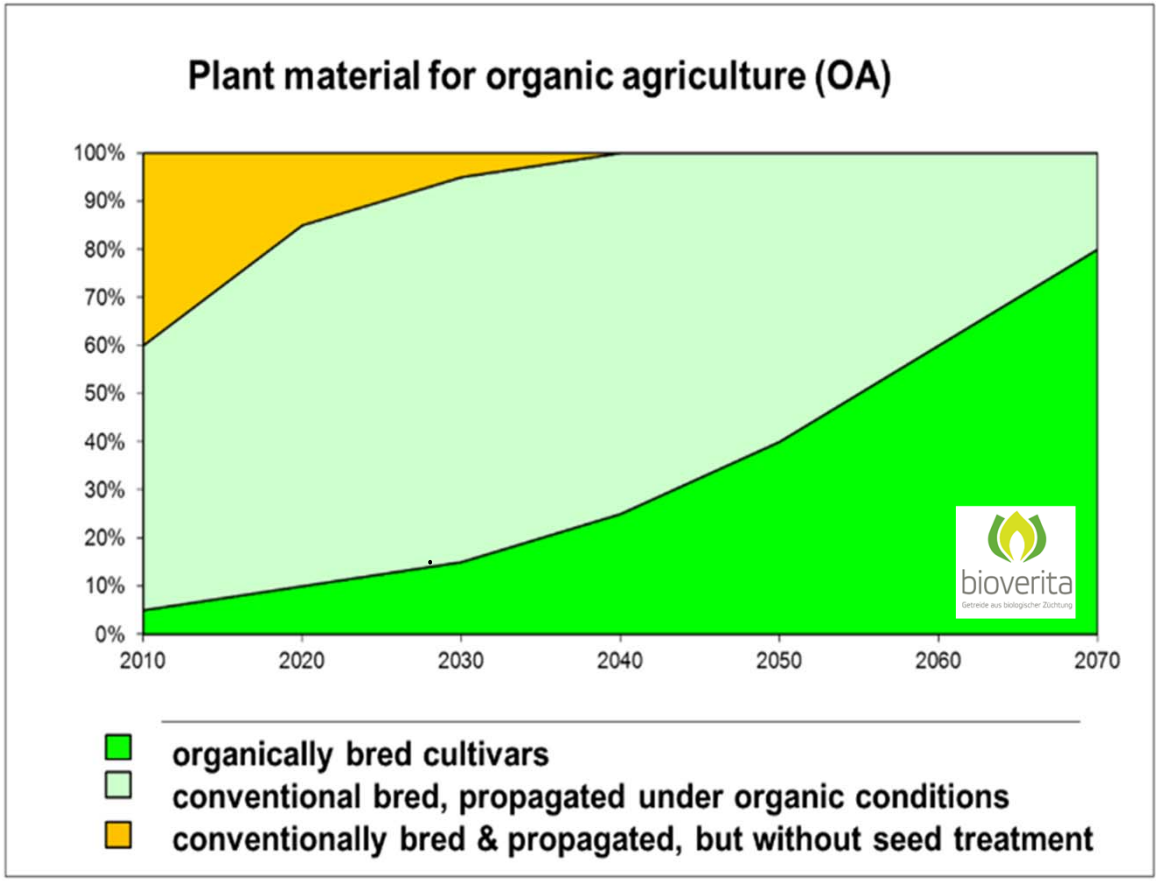


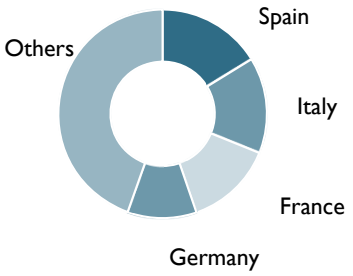
Figure 1 : Schematic time line to reach the goal of 100% organically propagated seed of suitable cultivars (light green) in short term and to foster cultivars specifically bred for organic farming systems (bright green) in the long term

LIVESEED

EUROPE: ORGANIC FARMLAND 2017

Europe
14.6
Million ha

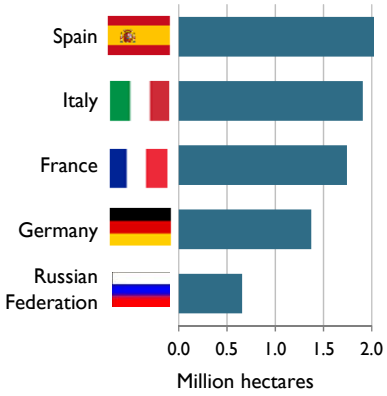
Over half of Europe´s organic farmland is in 4 countries.



Distribution of organic agricultural land by country 2017

Spain
2.1
Million ha

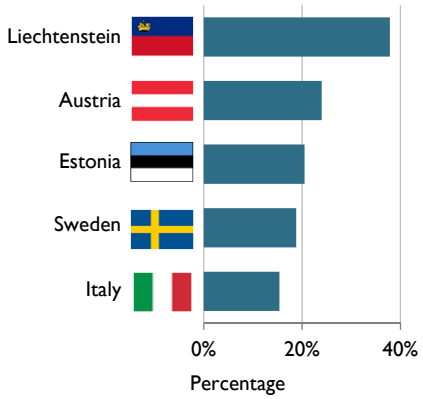
The country with the largest area of organic farmland is in Spain, followed by Italy and France.



Top 5 countries with the largest areas of organic agricultural land 2017

2.9%
of Europe s farmland is organic
(EU 7.2%)

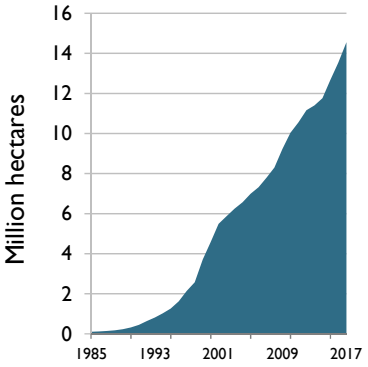
Ten countries have 10% or more of their agricultural land under organic management.



Top 5 countries, where more than 10 percent of the farmland is organic 2017

+75%
in the decade 2008-2017

In 2017 over one million hectares more were reported compared with 2016.



Growth of the organic agricultural land 1985–2017

Source: FiBL survey 2019 www.organic-world.net

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

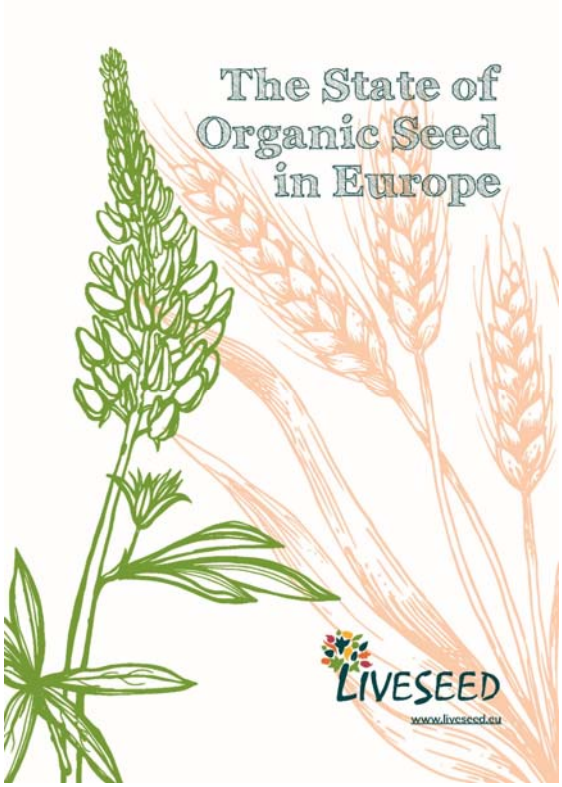
→ LIVESEED assessed present derogation reports, national organic seed database, and estimated use of **organic seed across Europe** and collected best practice for policy implementation from different countries www.liveseed.eu > tools > booklets

→ Recommendations to improve implementation of organic seed use www.liveseed.eu > Results > WP1 > **D1.9 report on political obstacles**

→Developmet of a **EU wide router-database** with interface to national databases

LIVESEED

Production and Use of Organic Seed Transparency

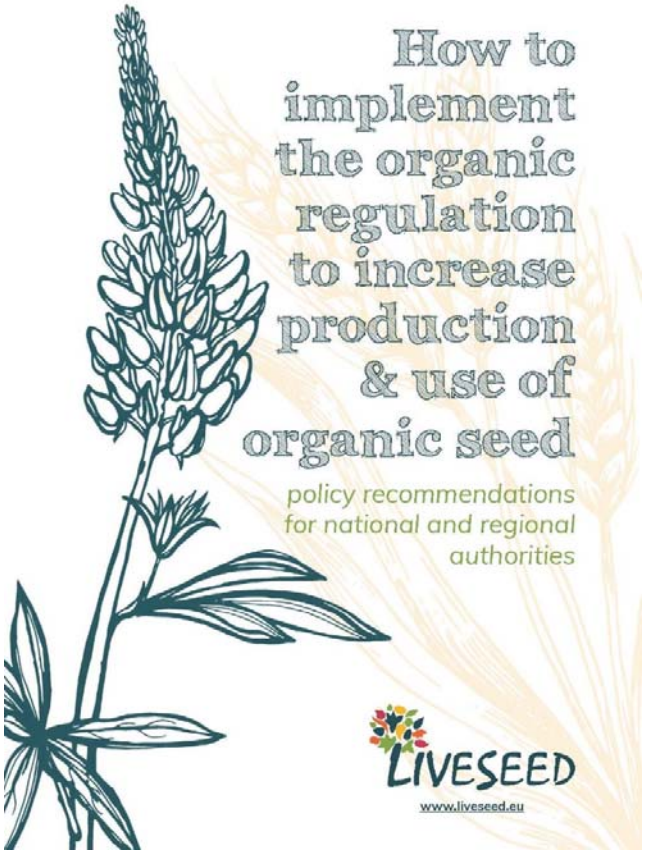


www.LIVESEED.EU > Tools for Practitioners > Booklets

- **National Organic seed databases as basis for derogations**:
  - Implemented as online, Excel or pdf
  - Only few are well developed, informative and user-friendly for farmers and seed companies
  - Most are not frequently updated, incomplete, not easy accessible
  - Not frequently used
  - Only few with interactive request for derogation and reporting
- **Derogation reports on non-organic seed use**
  - Reports are not easily available and not standardized across countries (e.g. different units, formats, often pdf, not interoperable)
  - Reports on crop species with general derogation are missing, data are not always accurate
  - Allow no monitoring of progress

LIVESEED

Implementation of derogation rules



- **Annex on of crop species where no derogation is granted (Category I)** across the EU is empty

→ National Annex of Category I defined in cooperation with expert groups is a successful model in several countries with higher percentage of organic seed

www.LIVESEED.EU > Tools for Practitioners > Booklets

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

LIVESEED

Analysis of derogation reports

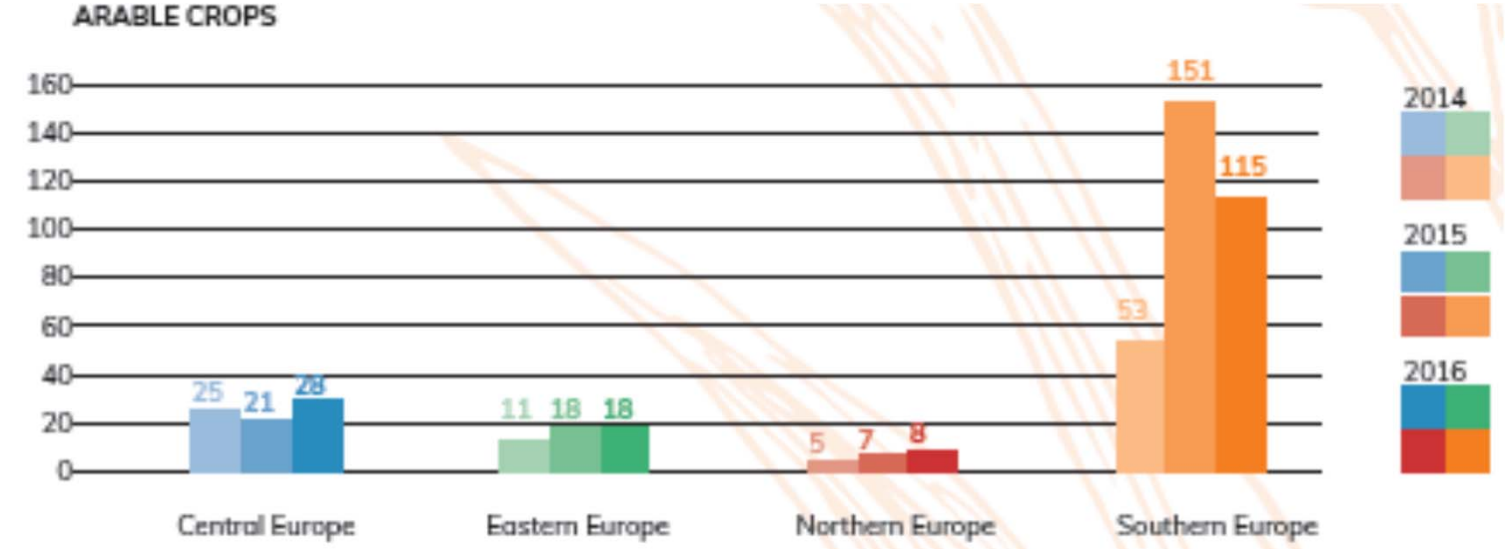


FIGURE 2.2 Number of derogations per 1.000 hectares of organic arable land by EU geographical region over the 2014-2016 period.

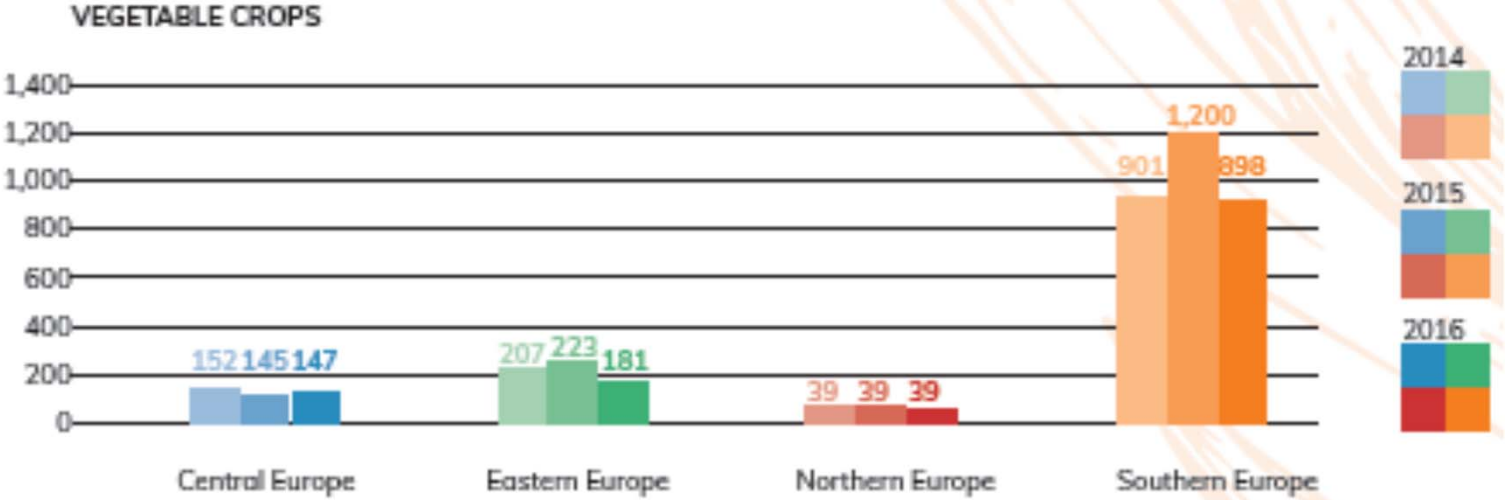
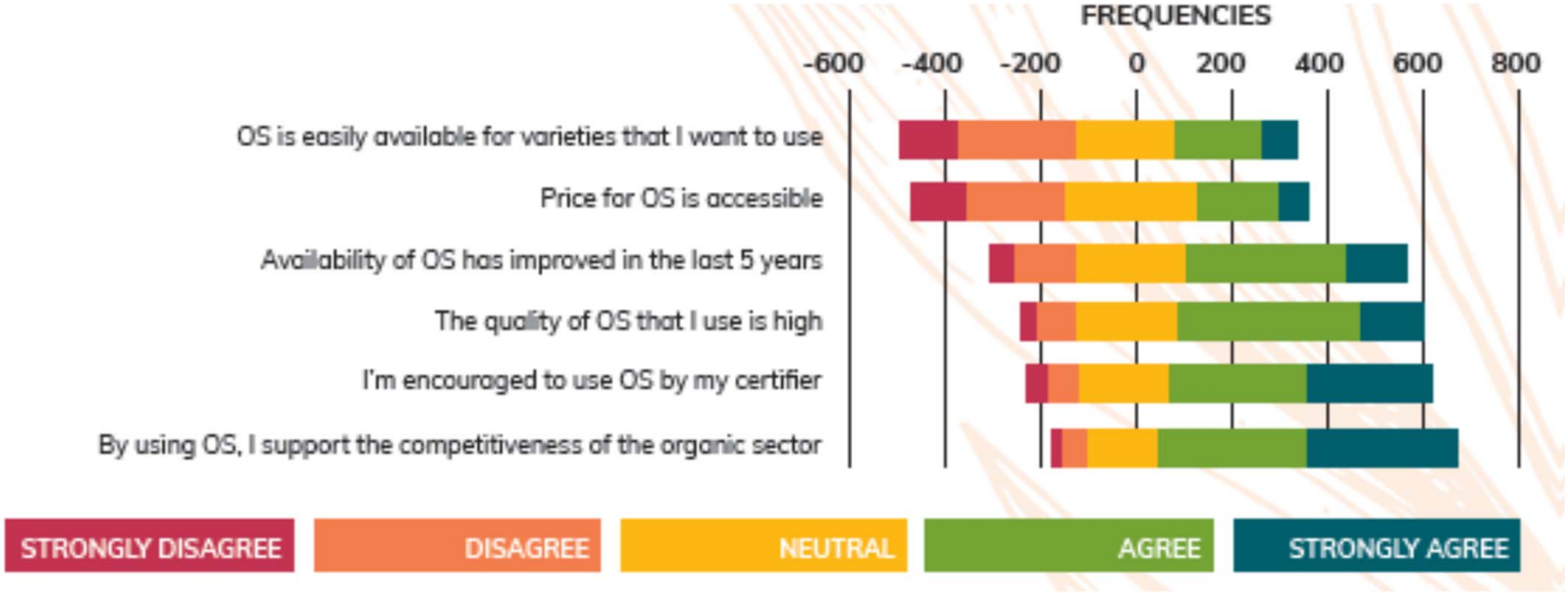
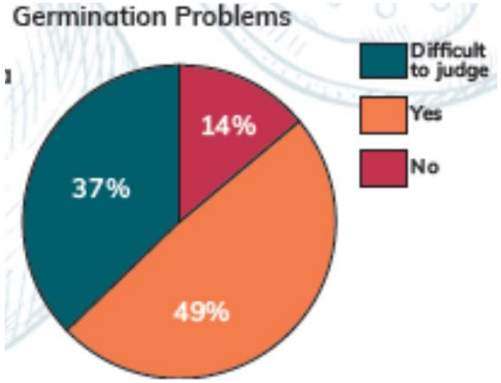
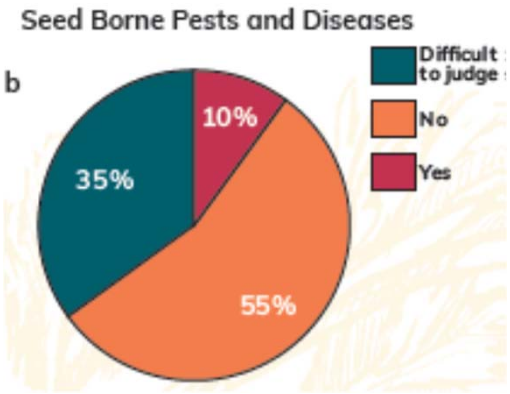


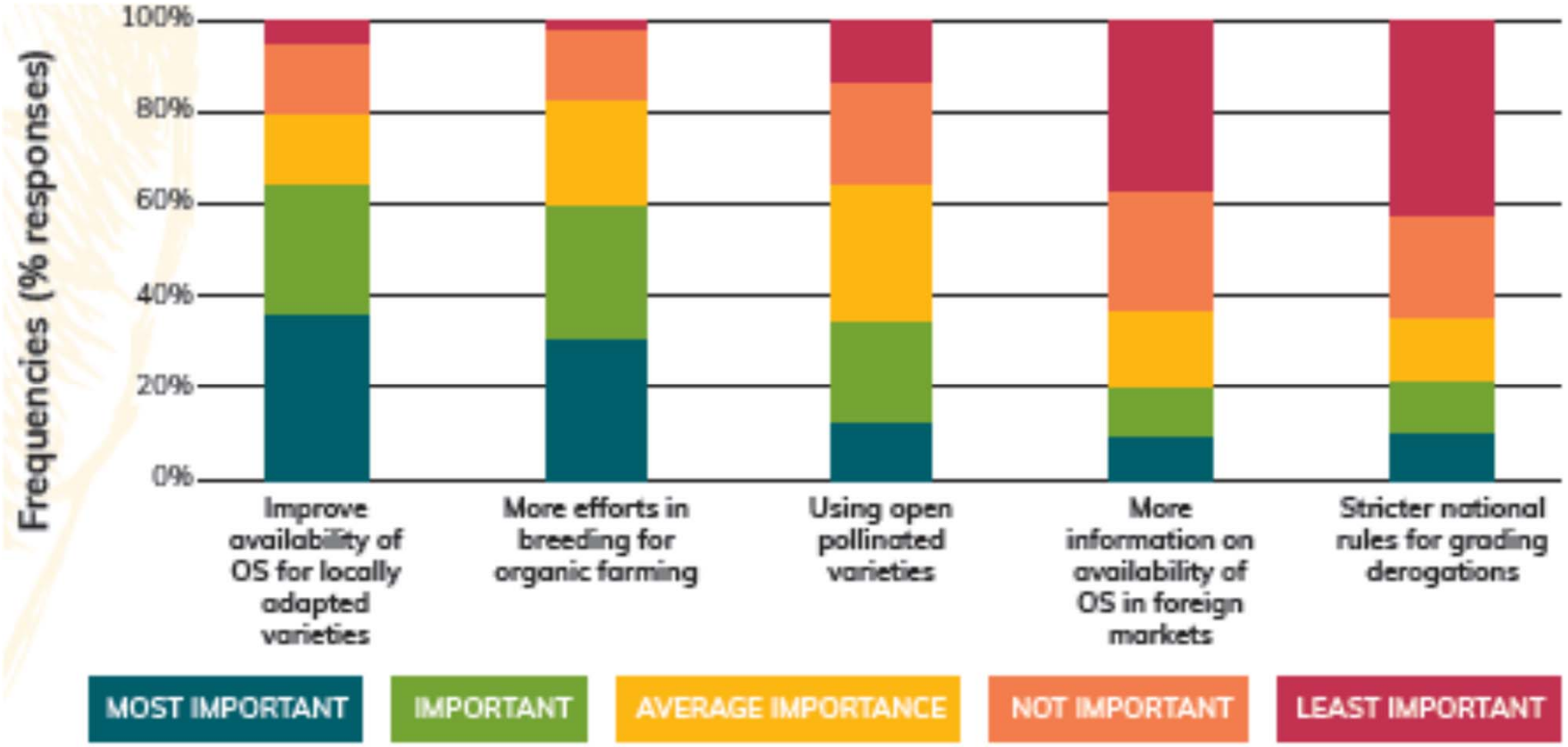
FIGURE 2.3 Number of derogations per 1.000 hectares of organic arable land by EU geographical region over the 2014-2016 period.

Attitude of farmes towards Organic Seed








Frequencies (% responses)
100%
80%
60%
40%
20%
0%
Improve availability of OS for locally adapted varieties
More efforts in breeding for organic farming
Using open pollinated varieties
More information on availability of OS in foreign markets
Stricter national rules for grading derogations
MOST IMPORTANT
IMPORTANT
AVERAGE IMPORTANCE
NOT IMPORTANT
LEAST IMPORTANT

Seed companies rating on policy meassures

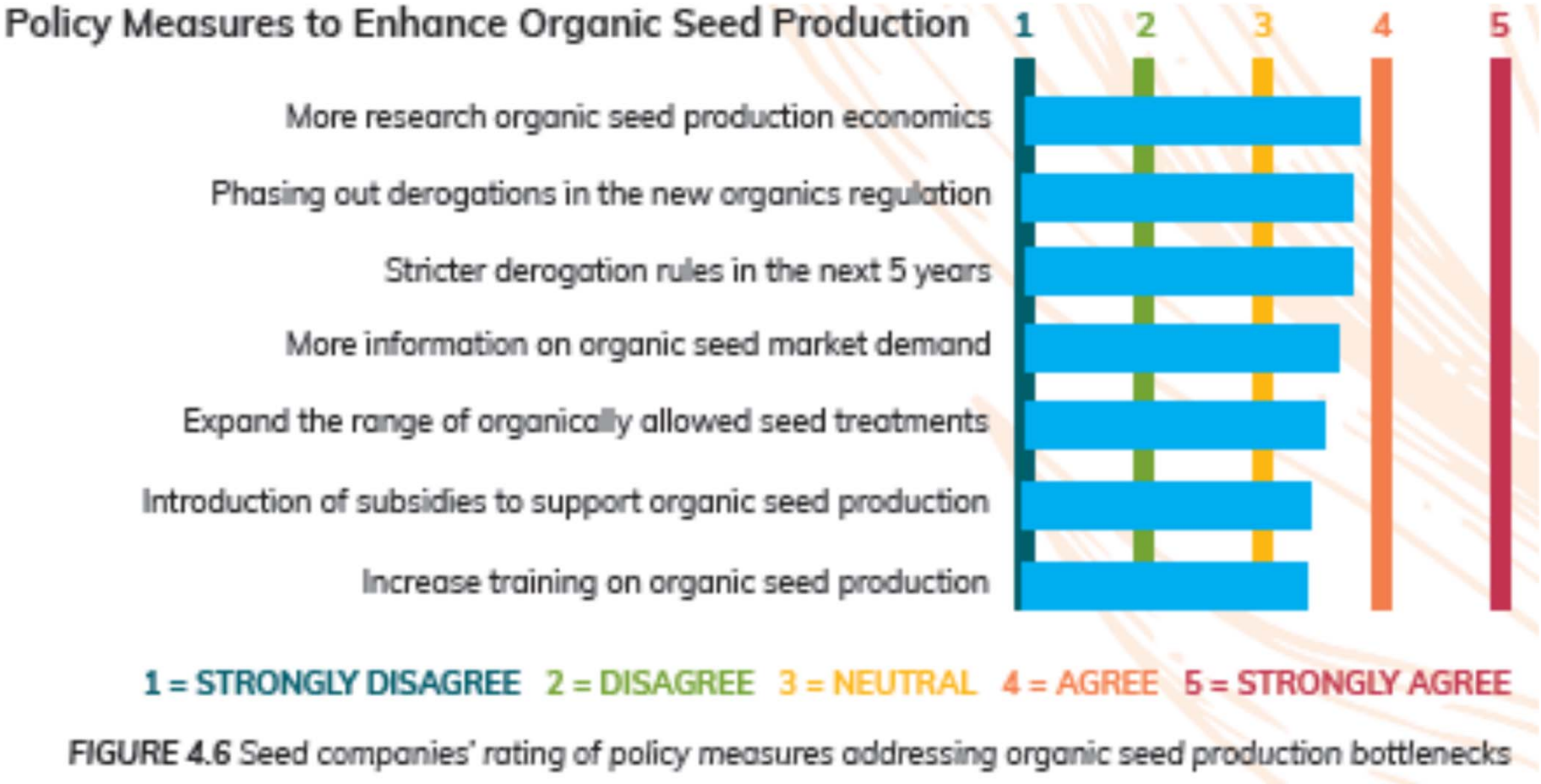


FIGURE 4.6 Seed companies' rating of policy measures addressing organic seed production bottlenecks

LIVESEED

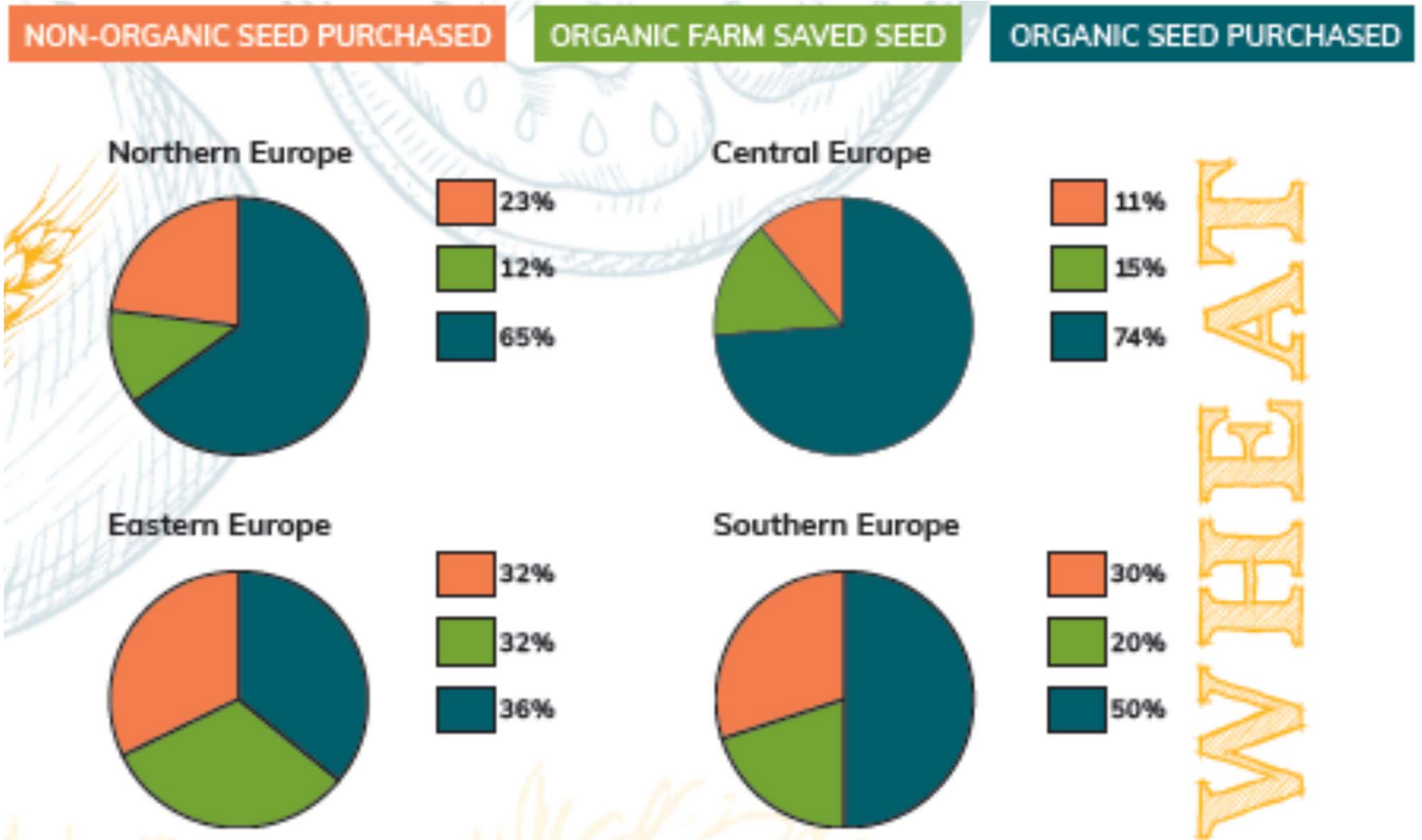
Estimation of percentage of organic seed use

Based on farmer survey

	Organic seed purchased (Amount & percentage)	Organic farm saved seed (Amount & percentage)	Non-organic seed purchased (Amount & percentage)	Total organic seed demand (Amount)
GRAINS				
Wheat (t)	79,699 (57%)	27,366 (20%)	33,073 (24%)	140,138
Grain maize (t)	1,422 (52%)	556 (20%)	762 (28%)	2,740
Barley (t)	23,828 (55%)	8,393 (19%)	11,409 (26%)	43,630
Oats (t)	26,766 (55%)	12,002 (25%)	9,932 (20%)	48,700
LEGUMES				
Lupine (t)	1,683 (47%)	667 (19%)	224 (34%)	3,574
Soybeans (t)	5,910 (60%)	1,291 (13%)	2,709 (27%)	9,910
Peas (t)	7,300 (55%)	1,434 (11%)	4,458 (34%)	13,192
Lucerne (t)	1,118 (50%)	370 (17%)	739 (33%)	2,227
VEGETABLES				
Tomatoes*	209,190,115 (58%)	103,287,061 (28%)	50,688,469 (14%)	363,165,645
Onions*	2,589,162,058 (75%)	307,885,817 (9%)	570,275,011 (16%)	3,467,322,886
Carrots (t)	15.1 (70%)	1.6 (8%)	4.8 (22%)	21.5
FRUIT				
APPLES*	1,834,124 (41%)	696,913 (16%)	1,915,808 (43%)	4,446,845

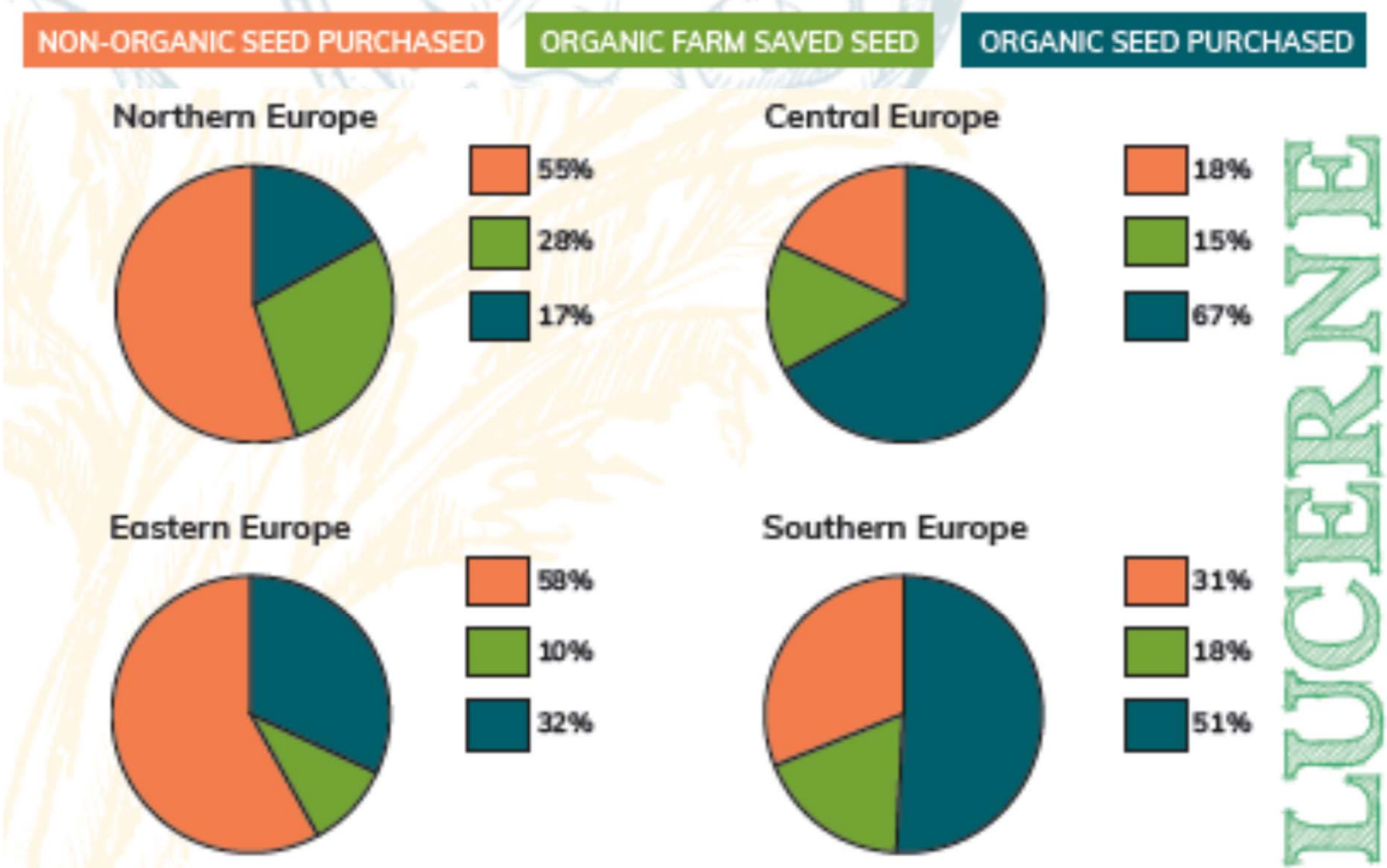
LIVESEED

Percentage of non-organic seed



Based on farmer survey

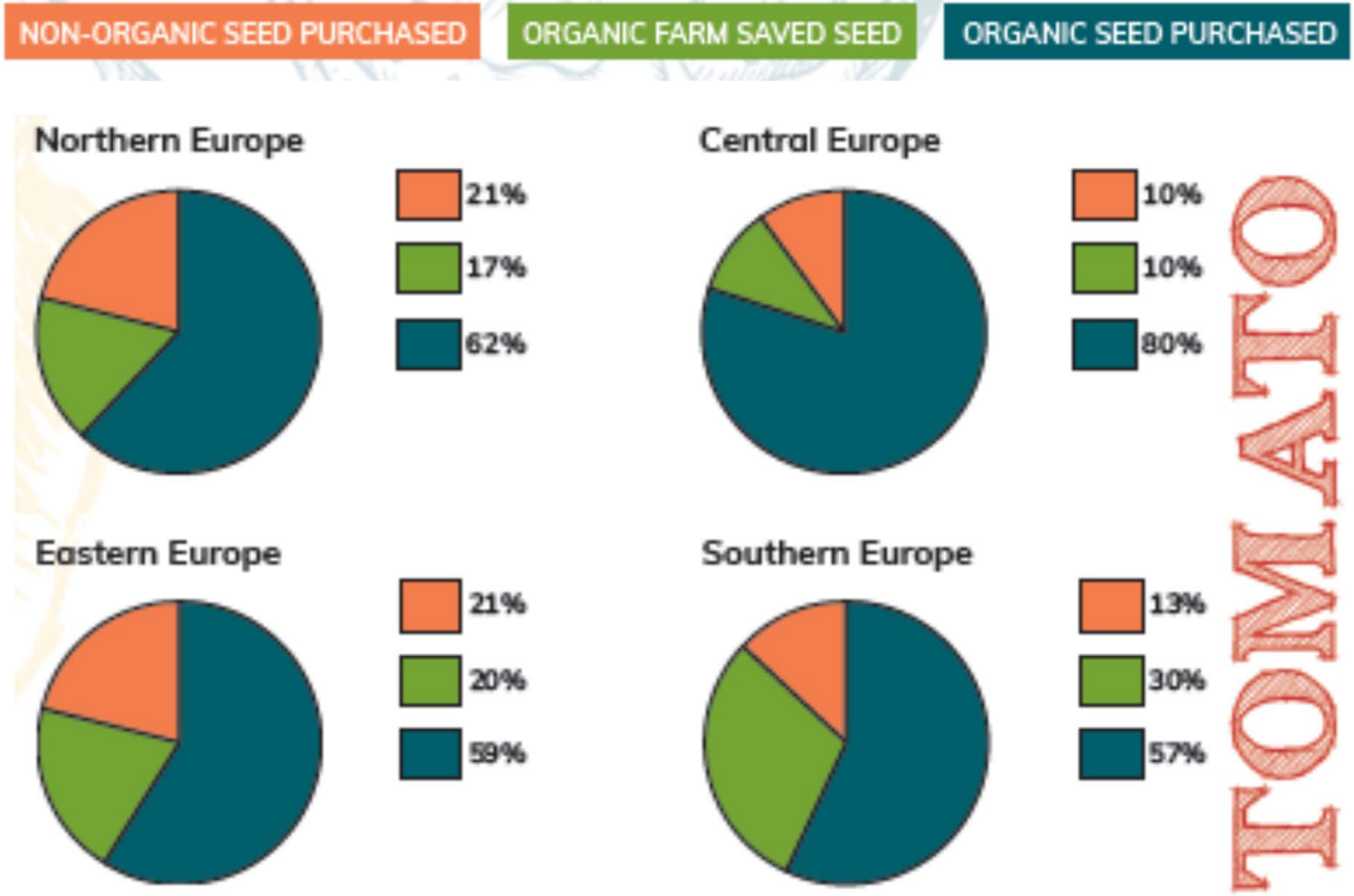
Percentage of non-organic seed



LIVESEED

Based on farmer survey

Percentage of non-organic seed



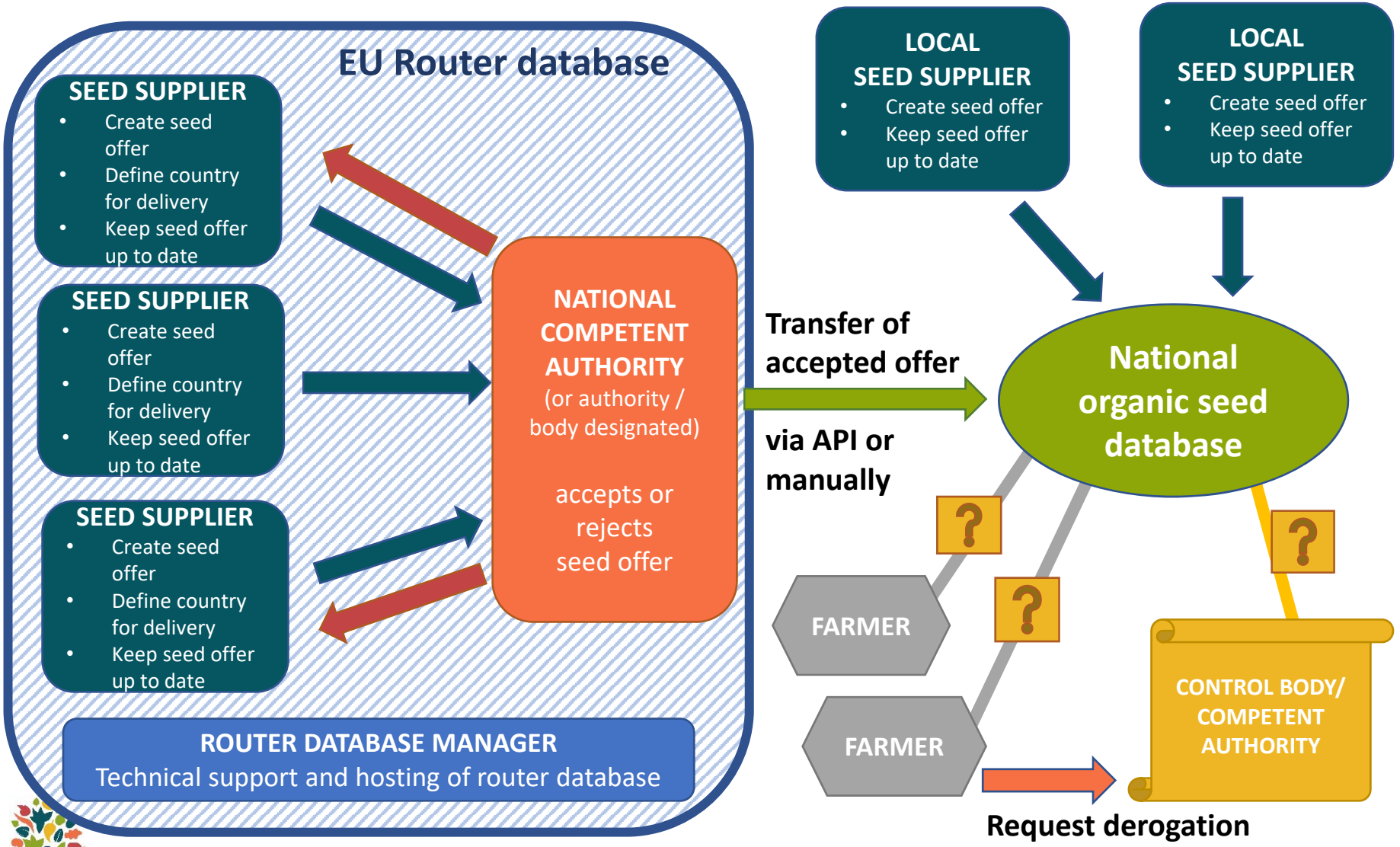
Based on farmer survey

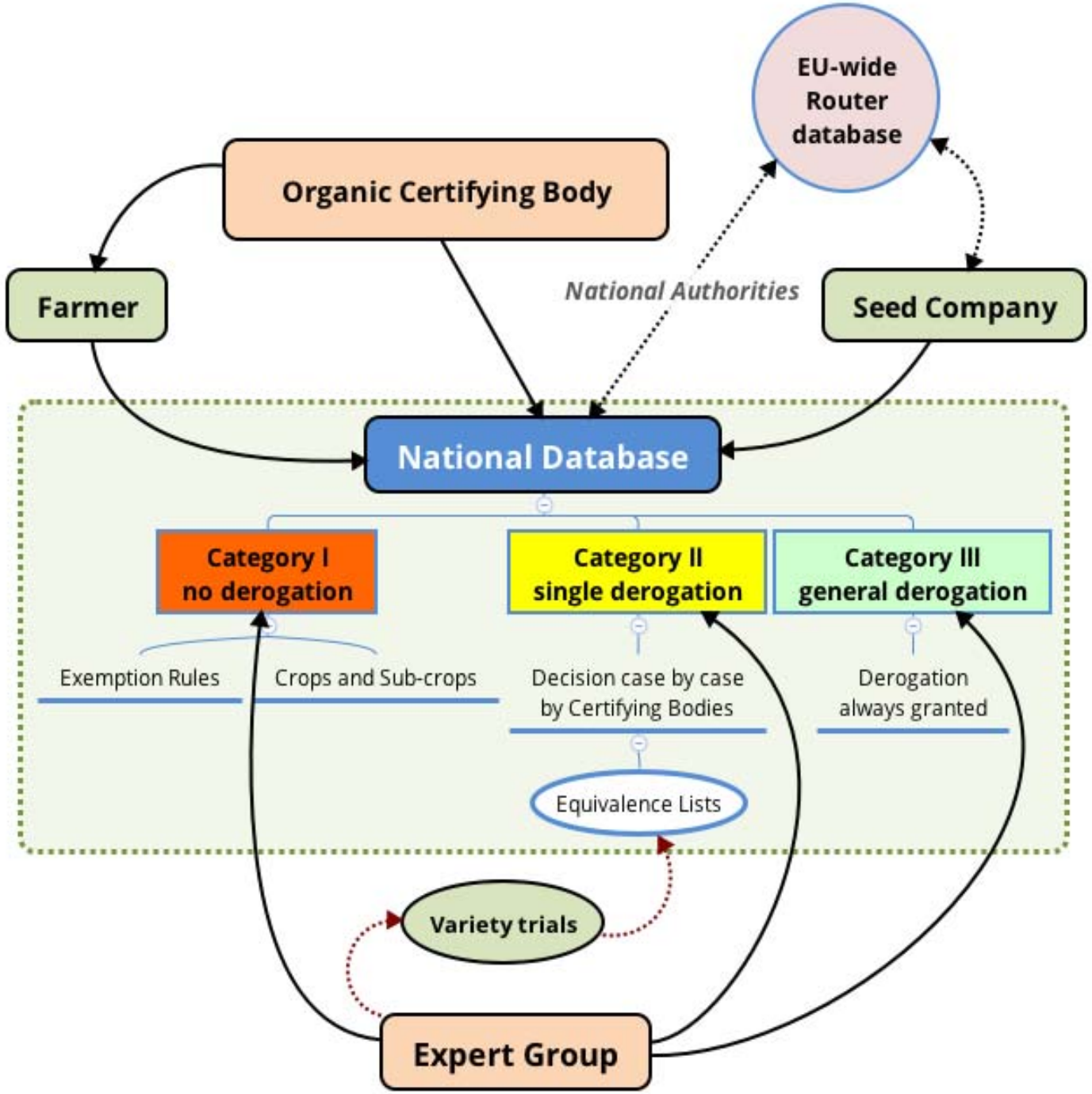
Development of EU wide router database

- Support transparency of available organic seed offers
- Simplify access to international organic seed markets
- Reduce administrative burdens for seed supplier
- Harmonize the use of databases in the EU
- Provide additional information (e.g. breeding process)
- With interface to national databases
- Pilot with organicXseeds which runs already in 8 countries (DE, CH, UK, BE, LX, SW, IR)
- If required central database for notification of organic heterogeneous material notification could be implemented

LIVESEED

EU router database




EU-wide Router database
Organic Certifying Body
Farmer
National Authorities
Seed Company
National Database
Category I no derogation
Category II single derogation
Category III general derogation
Exemption Rules
Crops and Sub-crops
Decision case by case by Certifying Bodies
Derogation always granted
Equivalence Lists
Variety trials
Expert Group

Policy recommendations for organic seed use

- Harmonized and stricter implementation of derogation rules for non-organic seed
  - National Annex without derogation defined in collaboration with seed expert groups
  - Standardized monitoring on all non-organic seed use and synthesis across countries
  - National categorization of all crops or subcrops into 3 categories (1 = no derogation, 2 = individual derogation per farmer, 3 = general derogation without application)
  - Develop roadmap with timelines how to move from Cat. 3 to Cat. 2 and Cat. 1 and monitoring of progress
  - Announcement of crops that will move from Cat. 2 to Cat. 1 2-3 years in advance

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

LIVESEED

Policy recommendations for organic seed use

- Improved interactive national databases as basis for derogations
  - Interactive online frequently updated database with easy access to farmers and seed producers
  - Seed companies can update there offer without intermediar
  - Farmers can apply for derogation via database
  - Farmers should notify use and quantity of non-organic seed for Cat. 2 and Cat. 3
  - National derogation reports need to be standardized to allow annual synthesis across Europe and proper monitoring
- Eu-wide router database linked to national databases
  - Seed companies can offer their seed to several countries in only one database → larger choice for farmers, higher transparency, less administration

LIVESEED

Policy recommendations for organic seed use

- Improved data collection and monitoring on production and use of organic seed
  - Assess amont of organic / non-organic seed during certification process at farm level including farm saved seed
  - Assess amount of organic seed produced in cooperation with European Seed Certification Association Agencies who already collect statistic data on certified seed per crop and country, but only few differentiate between organic and non-organic seed
  - Synthesis of standardized national derogation reports for all crops and countries

  → improved data source on organic seed across Europe

  → solid datasource to restrict derogations

  → allows proper monitoring to achieve 100% organic seed in reasonable time

LIVESEED

Policy recommendations for organic seed use

- Improve percentage of organic seed usage to 100%

Perspective of farmers

- Provide broader choice of cultivars that are locally adapted, suited for organic farming and meet quality requirements → Breeding, 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 → Breeding, improved seed production and seed health strategies, seed treatments
- Accept farm saved seed as organic seed in all countries
- Support farmers or farmers cooperatives to engage in organic seed entrepreneurship → training, infractructure, subsidies

Perspective of seed companies

- National Cat. 1 and stricter implementation (and phasing out) of derogations rules provides security for seed companies to invest in organic seed as organic market is constantly growing in Europe
- Transparency on European organic seed market and implementation of organic regulation
- Enable and ease market access of novel types of cultivars

LIVESEED

Political Framework
Organic Heterogeneous Material

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

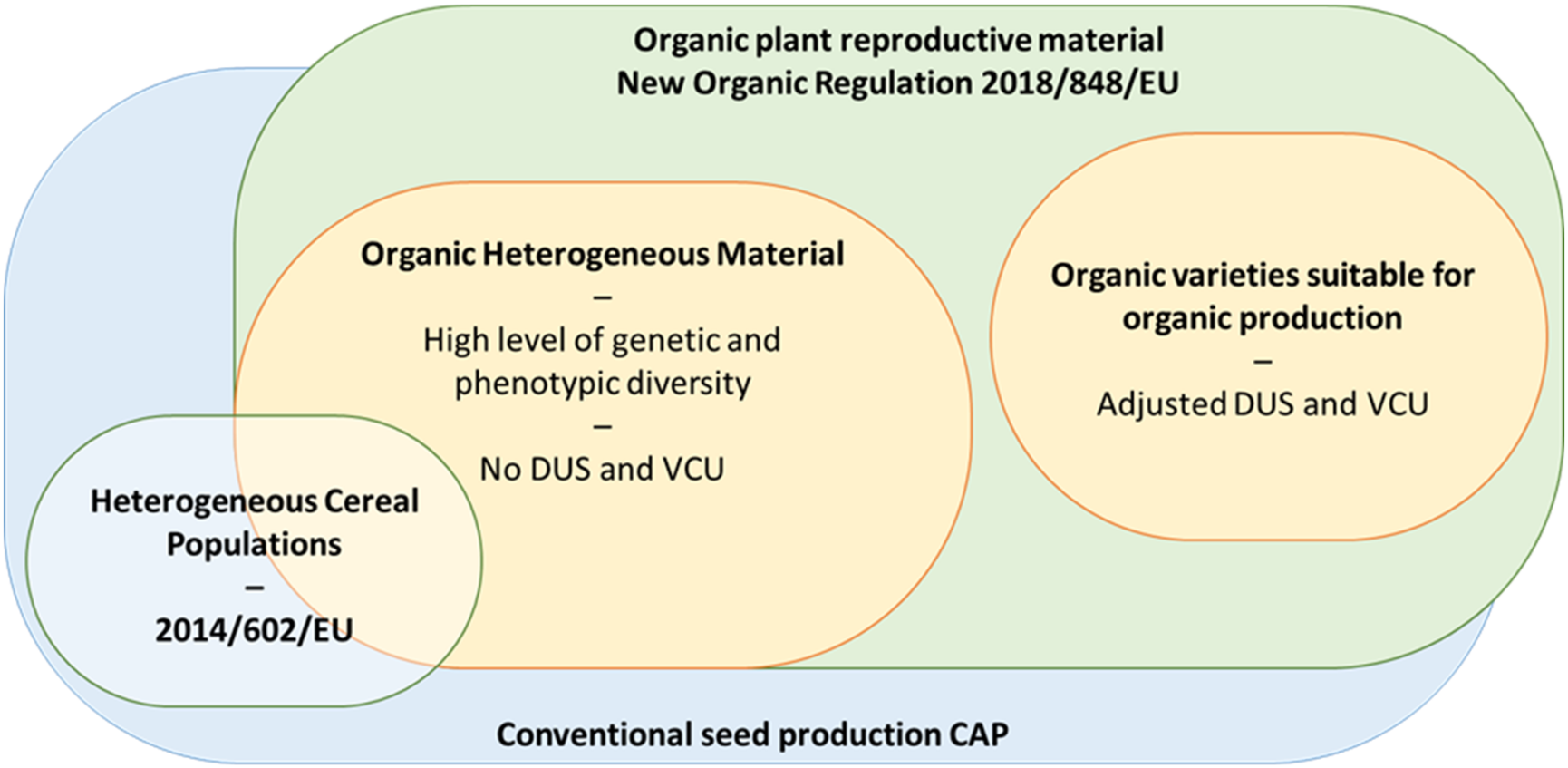
→ LIVESEED analysed running experiment on marketing heterogeneous populations of cereals and developed toolbox for characterization and description of organic heterogeneous material

→ www.liveseed.eu **> 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 2019

LIVESEED

Novel Cultivar Types



- Definition of organic plant breeding
- Definition of organic heterogeneous material 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**

LIVESEED

www.liveseed.eu > Results > WP2

Organic Heterogeneous Material

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

LIVESEED

www.liveseed.eu > Results > WP2 > D2.8 'Proposal for a toolbox for identification and description of organic heterogeneous material'

Organic Heterogeneous Material

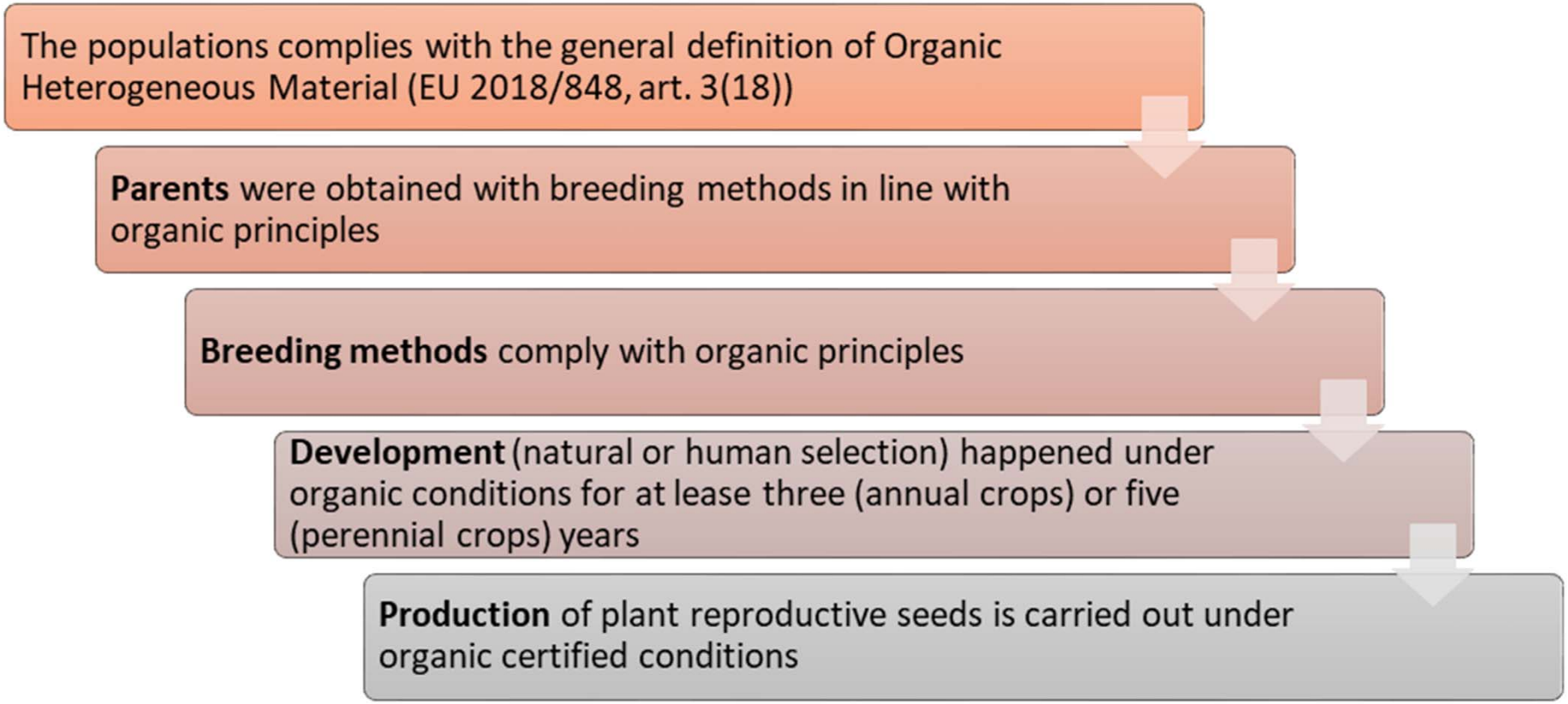


Figure 2. Checklist in successive steps of the general provisions for registration of "Organic Heterogeneous Material".

www.liveseed.eu > Results > WP2 > D2.8 'Proposal for a toolbox for identification and description of organic heterogeneous material'

Organic Heterogeneous Material

- All crop species can be OHM
- Production of OHM means development (human and/or natural selection) under certified organic conditions for at least 3 / 5 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

LIVESEED

www.liveseed.eu > Results > WP2 > D2.8 'Proposal for a toolbox for identification and description of organic heterogeneous material'

Organic Heterogeneous Material

	Farmers' selection	Dynamic population	CCP
Origin	**Highly relevant** Original population	**Highly relevant** List of parents	**Highly relevant** List of parents
Region of cultivation	**Highly relevant** in terms of e.g. geographical origin	**Medium relevance** as related to natural selection during development	**Medium relevance** as related to natural selection during development
Breeding method 1: constitution	**Not relevant**	**Low relevance** as the starting point is always a physical mixture	**Highly relevant** for the methods used in the initial crosses
Breeding method 2: development (pre-notification)	**High Relevance** to describe which selection has been applied	**Medium relevance** if direct selection is applied, otherwise related to region of cultivation specifying management	**Medium relevance** if direct selection is applied, otherwise related to region of cultivation specifying management
Breeding method 3: production / multiplication (post-notification)	**Medium relevance**, and it may change significantly according to the species life cycle	**Medium relevance** and might change if self- or cross-pollinated species	**Low relevance** as progeny is supposed to be multiplied as bulk
Phenotypic traits	**High relevance** as related to selection as advised by the 'breeder'	**Medium relevance** if direct selection is applied as advised by the 'breeder'	**Medium relevance** if direct selection is applied as advised by the 'breeder'
Traceability	**Low relevance**	**Medium relevance** as also keeps track of natural selection	**High relevance** as also keeps track of natural selection

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 > Results > WP5 and WP6 > Conferences and Workshop Material

LIVESEED

Political Framework
Organic Varieties

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 > Results > WP2 > Deliverable 2.1

LIVESEED

New organic regulation 2018/848 (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]

LIVESEED

New organic regulation 2018/848 (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

LIVESEED

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

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 goveranance 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 on 4th February 2020 in Brussels

→ provide input for implementing acts for temporary experiments on varieties suited for organic agriculture (2021 – 2028)

FiBL
www.fibl.org

LIVESEED

ECO-PB

Adjusted protocols for 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

LIVESEED

Example: ***carrots for bundling***)

UPOV Nr.	asterix characteristics	characteristics of the UPOV protocol for carrots usable for fresh market (bundling and marketing with leafs)	relevance of utility for: farmers / producers (0=none, 1=medium, 2=great)	relevance of utility for: trade / processors (0=none, 1=medium, 2=great)	relevance of utility for: consumers (0=none, 1=medium, 2=great)	importance for selection: organic carrot breeders (0=none, 1=medium, 2= great)	ECO-PB proposal for adapted protocol: Characteristics to be considered mandatory	ECO-PB proposal for adapted protocol: characteristics to be considered optionally on request (or recommendation) of the applicant
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: ridgning 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 inte[illegible]gitu[illegible]n)	2	2	2	2	1	0
						characteristics in total:	20	11

31

20 + 11

LIVESEED

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

Adjusted protocols for VCU

- 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

LIVESEED

www.liveseed.eu

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.