LiveSeeding

D 5.1 Report on bottlenecks and opportunities for the horizontal proliferation and scaling-up of the organic seeds and cultivar testing network

Authors: **Ana – Marija Špicnagel (IPS Konzalting)**
Margareta Đumbir (IPS Konzalting)
Dora Maričić (IPS Konzalting)
Ivan Dlačić (IPS Konzalting)
Sara Mrkšić (IPS Konzalting)

Deliverable Number	D5.1
Work Package	WP5
Deliverable type	Document, report
Dissemination level	Public
Deliverable Lead partner	IPS Konzalting
Due date	30 September 2024
Submission date	4 November 2024
Version	V1.4
Reviewers	Freya Schäfer (FiBL-DE), María Carrascosa (RCxAe), Monika Messmer (FiBL-CH), Mariano Iossa (FiBL Europe)
Contact	ams@ips-konzalting.hr

Co-funded by the European Union

Funded by the European Union (grant no. 101059872), the Swiss State Secretariat for Education, Research and Innovation (Contract no. 22.0412) 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

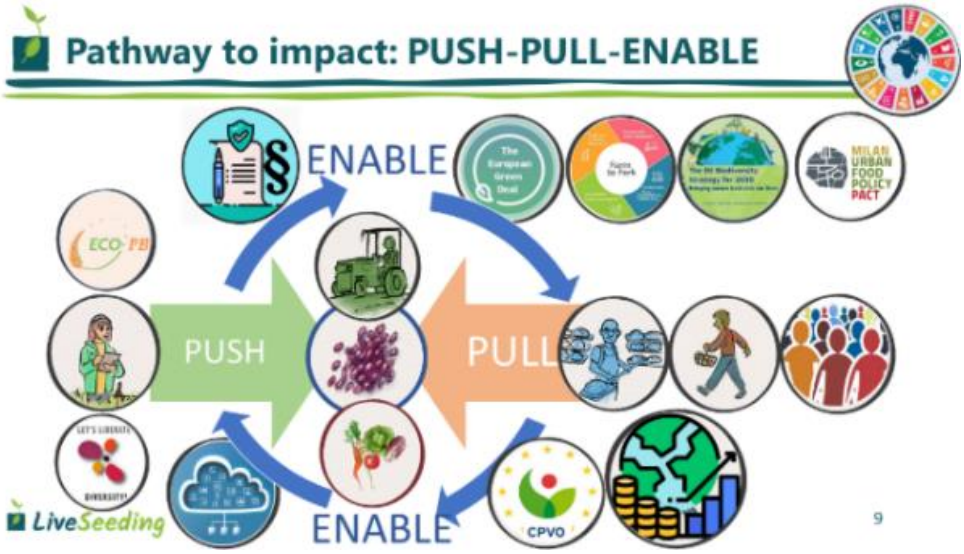
History of changes

Version	Date	Author	Comments
Version 1	22 October 2024	Ana-Marija Špicnagel, Dora Maričić, Ivan Dlačić, Margareta Đumbir	First version
Version 1.1	28 October 2024	Freya Schäfer (FiBL-DE), María Carrascosa (RCxAe) Monika Messmer (FiBL-CH),	Review 1
Version 1.2	30 October 2024	Ana-Marija Špicnagel, Margareta Đumbir	Integration of inputs from reviewers
Version 1.3	31 October 2024	María Carrascosa (RCxAe), Mariano Iossa (FiBL Europe)	Final version
Version 1.4	31 October 2024	Ana-Marija Špicnagel, Margareta Đumbir	Final version

LiveSeeding - Organic seed and plant breeding to accelerate sustainable and diverse food systems in Europe *is a 4-year Innovation Action funded by the European Union, the Swiss State Secretariat for Education, Research and Innovation (SERI) and UK Research and Innovation (UKRI).* The project started in October 2022 and brings together 37 organisations operating in 16 European countries. LiveSeeding provides science-based evidence and best practice solutions to help achieve 100 % organic seed.

LiveSeeding contributes to the transition towards environmentally-friendly, climate-neutral, healthy and fair food systems through a ***PUSH-PULL-ENABLE strategy*** *to*

- enhance the availability and adequacy of organic seeds of cultivars appropriate to organic farming (PUSH),
- increase and stabilise the market demand for organic seeds of cultivars appropriate to organic farming (PULL),
- foster an enabling policy and regulatory environment where both demand and supply can harmoniously and productively negotiate without irrelevant constraints due to legal restrictions and/or regulatory fragmentation



(ENABLE).

LiveSeeding addresses the topics in a **holistic multi-actor**, **multi-stakeholder**, **participatory approach** involving stakeholders along the value chain in 17 local **Living Labs** (LLs) and 3 established networks of organic breeders (**ECO-PB**), seed savers (**ECLLD**) and Milan Urban Food Policy Pact (**MUFPP**). 15 European countries cover the different pedoclimatic zones and socio-economic contexts, including countries with a low level of development in organic seed and breeding in East and South Europe.

Table of Contents

LIST OF ABBREVIATIONS **5**

LIST OF FIGURES **6**

LIST OF TABLES **7**

LIST OF DIAGRAMS **7**

SUMMARY **8**

1. INTRODUCTION AND BACKGROUND INFORMATION **9**

2. METHODOLOGY & SCOPE **15**

2.1 SWOT ANALYSIS 16

2.2 SURVEY ON THE EUROPEAN ORGANIC SEED AND BREEDING SECTOR 18

2.3 STAKEHOLDER WORKSHOP 19

2.4 BUSINESS BIRDVIEW (BB) 20

3. RESULTS AND DISCUSSION **21**

3.1 SWOT ANALYSIS OF ORGANIC SEEDS PRODUCERS AND CULTIVAR TESTING NETWORKS 21

3.1.1 SWOT analysis – comparison of organisation type 25

3.1.2 SWOT analysis of organic seed producers 28

3.1.3 SWOT analysis of cultivar testing networks 30

3.1.4 SWOT analysis – comparison of crop types 32

3.2 WORKSHOP WITH THE STAKEHOLDERS 35

Discussion and key conclusion points 36

3.3 SURVEY ON THE EUROPEAN ORGANIC SEED AND BREEDING MARKET 40

3.3.1 GENERAL PROFILES 42

3.3.2 ECONOMIC CHALLENGES 47

3.3.3 TECHNICAL CHALLENGES 49

3.3.4 LEGAL AND POLITICAL CHALLENGES 51

3.3.5 ENCOURAGEMENT ACTIONS 53

3.3.6 TRAINING 55

3.4 WORKSHOP "MARKET OPPORTUNITIES AND TECHNICAL CHALLENGES FOR ORGANIC SEED PRODUCERS" 56

3.4.1 Outcomes 57

3.4.2 Technical Challenges in Organic Seed Production 58

3.4.3 Economic Challenges in Organic Seed Production 58

3.4.4 Regulatory Challenges Supporting Organic Seed Production 59

3.4.5 Key conclusion points 60

4. CONCLUSIONS AND RECOMMENDATIONS BY TYPOLOGY **61**

4.1 TYPE OF ACTIVITY 62
4.2 TYPE OF ORGANISATION 66
4.3 CROP TYPE 72
4.4 PRODUCTION TYPE 77
5. CONCLUSIONS AND RECOMMENDATIONS 81
5.1 CUSTOMERS AND CHANNELS 81
5.2 UNIQUE SELLING PROPOSITION (USP) 83
6. REFERENCES 86
ANNEX 1 SWOT INTERVIEW CONCEPT FOR ORGANIC SEED PRODUCERS 87
ANNEX 2 SWOT INTERVIEW CONCEPT FOR CULTIVAR EVALUATION NETWORKS 90

List of abbreviations

BB	Business Birdview
CAPEX	Capital expenditure
ECO-PB	The European Consortium for Organic Plant Breeding
ECLLD	European Coordination Let´s Liberate Diversity
EU	European Union
FiBL	Research Institute of Organic Agriculture
GMO	Genetically modified organism
NGO	Non-governmental organisation
OHM	Organic Heterogeneous Material
OPEX	Operational expenditure
OV	Organic Variety
PI System	Plant Information system
R&D	Research and development
RCxAe	Red de Municipios por la Agroecología
SERI	The Swiss State Secretariat for Education, Research and Innovation
SWOT	Strengths, weaknesses, opportunities and threats
UKRI	UK Research and Innovation
USP	Unique Selling Proposition/Point

List of figures

Figure 1 Percentage of organic vs conventional area in 2022 10
Figure 2: Figure showing the percentage of organic consumption per capita in the three-year period 2020-2022 11
Figure 3: Land area under permanent organic grassland in Europe (million ha) 12
Figure 4: Land area under organic arable crops in Europe (million ha) 12
Figure 5: Land area under organic permanent crops in Europe (thousand ha) 13
Figure 6 Overview of the organic seed market 14
Figure 7 Structure of the report 15
Figure 8 Visual model of SWOT analysis and subcategories used 17
Figure 9 Visual representation of a "Business Birdview" model 20
Figure 10 Overview of countries presented in the SWOT analysis, based on interviews 22
Figure 11 Overview of typologies used for SWOT analysis 24
Figure 12 SWOT analysis – organisation type: company 25
Figure 13 SWOT analysis – organisation type: initiatives 26
Figure 14 SWOT analysis – organisation type: research centre 27
Figure 15 SWOT analysis - seed producers and traders 29
Figure 16 SWOT analysis – cultivar testing networks 31
Figure 17 SWOT analysis – crop type: vegetable 33
Figure 18 SWOT analysis – crop type: arable 34
Figure 19 Overview of all SWOT SPIDER diagram statements 39
Figure 20 Regions covered by the LiveSeeding survey 41
Figure 21 Number of survey responses per country 41
Figure 22 Organisation type per region 42
Figure 23 Respondents funds used for covering additional costs 47
Figure 24 Sources to obtain information 49
Figure 25 Topics for knowledge improvement – level of Europe 55
Figure 26 Topics for knowledge improvement – per country 55
Figure 27 Technical challenges – workshop brainstorm 58
Figure 28 Economic challenges – workshop brainstorm 59
Figure 29 Regulatory challenges – workshop brainstorm 59
Figure 30 Training topics – workshop brainstorm 60
Figure 31 Business Birdview template 61
Figure 32 Business Birdview – organic seed production 64
Figure 33 Business Birdview – Cultivar testing 65
Figure 34 Business Birdview – Company 69
Figure 35 Business Birdview – Research Centre 70
Figure 36 Business Birdview – Initiative 71

Figure 37 Business Birdview – arable production 75
Figure 38 Business Birdview – vegetable 76
Figure 39 Business Birdview – organic production 79
Figure 40 Business Birdview – Organic and conventional production 80
Figure 41 Overview of customers and channels 81
Figure 42 Overview of USP per typology 85

List of tables

Table 1 Overview of subcategories for SWOT analysis 17
Table 2 Overview of SWOT interviews conducted 22
Table 3 Overview of general profiling of respondents by age, gender and education level 43
Table 4 Overview of crops produced/traded by survey participants 44
Table 5 Interest of respondents to produce/trade organic seed and LIVESEED database presence 46
Table 6 Top 3 countries in which organic seeds are sold 48
Table 7 Overview of economic and technical challenges 50
Table 8 Overview or regulatory challenges and type of support needed 52
Table 9 Development of new cultivars – types of activities 54
Table 10 Feedback from the workshop participants 57

List of diagrams

Diagram 1 SWOT analysis - spider diagram - strengths 36
Diagram 2 SWOT analysis - spider diagram – weaknesses 37
Diagram 3 SWOT analysis - spider diagram – opportunities 38
Diagram 4 SWOT analysis - spider diagram – threats 39

Summary

This report is part of LiveSeeding Task 5.1, which aims to **analyse bottlenecks and opportunities in the organic seed and cultivar testing network markets**. Specifically, the task was focused on assessing obstacles that block horizontal proliferation (scale-out) and scale-up of organic seed and cultivar testing at the national and European levels.

We have addressed this by:

- mapping the organic and conventional seed companies that could start or strengthen their activity in organic seed production, cultivar evaluation and breeding at the national or EU level;
- conducting 17 interviews with relevant small, medium and large-size enterprises/initiatives (February 2024 – May 2024);
- conducting an online seed workshop, «Market opportunities and technical challenges for organic seed producers« at the beginning of the project (in collaboration with T3.4, 28.02.2023) to present current literature findings on the bottlenecks for the sector´s proliferation;
- conducting an online workshop with stakeholders interviewed to discuss the main findings (11.07.2024);
- developing a SWOT analysis based on the four main categories (S, W, O, T), but also classifying it according to the background type (technical, economic, socio and regulatory).

This report comprises all the elements indicated above (the results of the SWOT analysis and survey conducted and conclusions from the workshop conducted). In addition, conclusions and recommendations have been prepared based on the typology (type of activity, size, type of organisation, and crop type).

Efforts were made to develop an innovative template, **"Business Birdview"** (**BB**), that combines elements of the SWOT analysis and Business Model Canvas in one place to simplify the findings and make them easily digestible by relevant stakeholders.

1. Introduction and background information

To better understand the position and opportunities of organic seed production and cultivar testing, it is essential to have a good and straightforward overview of the entire agricultural sector, specifically the organic farming sector. This is crucial for identifying business opportunities and processes. Furthermore, regulatory frameworks, different regional and EU market factors, and organic farming targets significantly influence the direction and opportunities for the organic seed sector. Additionally, comprehending consumer behaviour and demand for organic products helps businesses align with market trends and respond effectively to emerging needs. This is called a "**PUSH-PULL-ENABLE**" model and is a key element of the LiveSeeding project. This model aims to enhance the availability and adequacy of organic seeds appropriate for organic farming (PUSH), increase and stabilise the market demand for these seeds (PULL), and foster an enabling policy and regulatory framework (ENABLE). This holistic understanding allows for better decision-making and strategic positioning within the sector.

Understanding the environment

Agriculture is facing multiple sustainability challenges nowadays. On the one hand, efficient management of food produced is required to feed a growing global population. ; on the other hand, food production systems are responsible for the depletion of natural resources and the pollution of ecosystems at an unsustainable rate, which may compromise food production for future generations.

Furthermore, climate change causes extreme weather conditions that threaten crop yields. Soil degradation and water scarcity further strain food production, while the growing global population increases the pressure on agricultural resources and food chain to ensure food security.

Transitioning from conventional to organic, sustainable agriculture is crucial to meeting international and European sustainability goals. Conventional agricultural systems are usually highly productive, ensuring high yields but with significant environmental costs. Conversely, organic agriculture is often criticised for achieving lower yields and the reduced ability to defeat particular promptly (Boschiero M. et al., 2023, link).

Organic agriculture

Organic agriculture is an essential component of sustainable development. It promotes environmental sustainability and social responsibility by prioritising biodiversity, soil health, ecological balance, and the use of renewable resources. The organic sector strives to apply organic standards to the entire life cycle of the plant, including the production and use of inputs such as seed. However, for many cultivated

plant species there is still little or no choice or organic seed. Seed, as a foundation and focus point for the development of agriculture, is at the centre of all principles of organic agriculture – health, ecology, fairness and care. Investments in organic seed production and plant breeding depends on an increased uptake of organically produced seed. Since the organic market sector is relatively small and costs in both organic plant breeding and organic seed production are high, there is still lack or limited choice of appropriate varieties for organic agriculture in many crops (Döring i sur., 2012).

According to Eurostat, the organic farming area in the EU expanded by 56% between 2012 and 2020, reaching over 14.7 million hectares, or roughly 9% of the total agricultural land. Consumer demand for organic products continues to rise, with organic food sales in Europe surpassing €45 billion in 2020, representing a 15% increase compared to the previous year. This growing market is driving higher demand for organic seeds. Yet, the supply remains constrained due to various challenges, including a lack of investment in organic seed breeding and insufficient research into regionally adapted varieties (EU Agricultural Economic briefs (europa.eu)).

By the end of 2022, more than 18.5 million hectares of organic agricultural land were managed organically with 480.000 producers in Europe. Regarding agricultural areas under organic practices, France, Spain, and Italy were the leading countries in 2022.

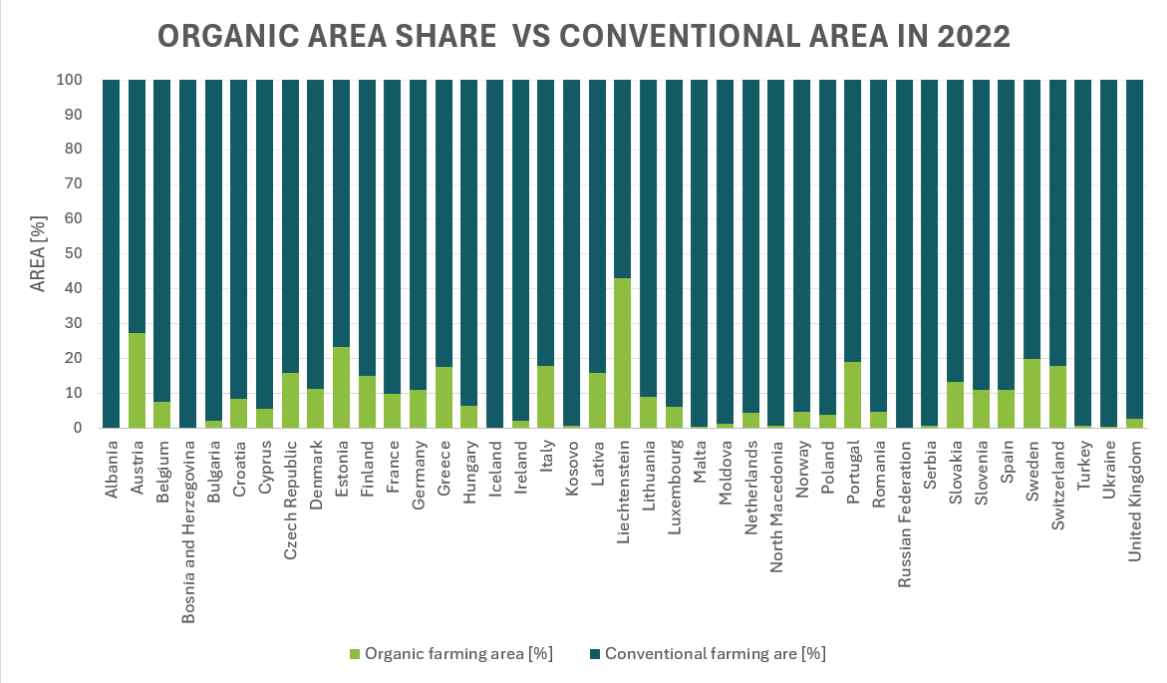


Figure 1 Percentage of organic vs conventional area in 2022

In addition, Europe has the highest organic per capita consumption. Denmark has the highest global organic market share, at 12%, followed by Austria at 11.5% and Switzerland at 11.2%.

In 2022, retail sales of organic products amounted to 53,1 billion euros. Retail sales can relate to consumer awareness per capita, as shown in Figure 2: Figure showing the percentage of organic consumption per capita in the three-year period 2020-2022.

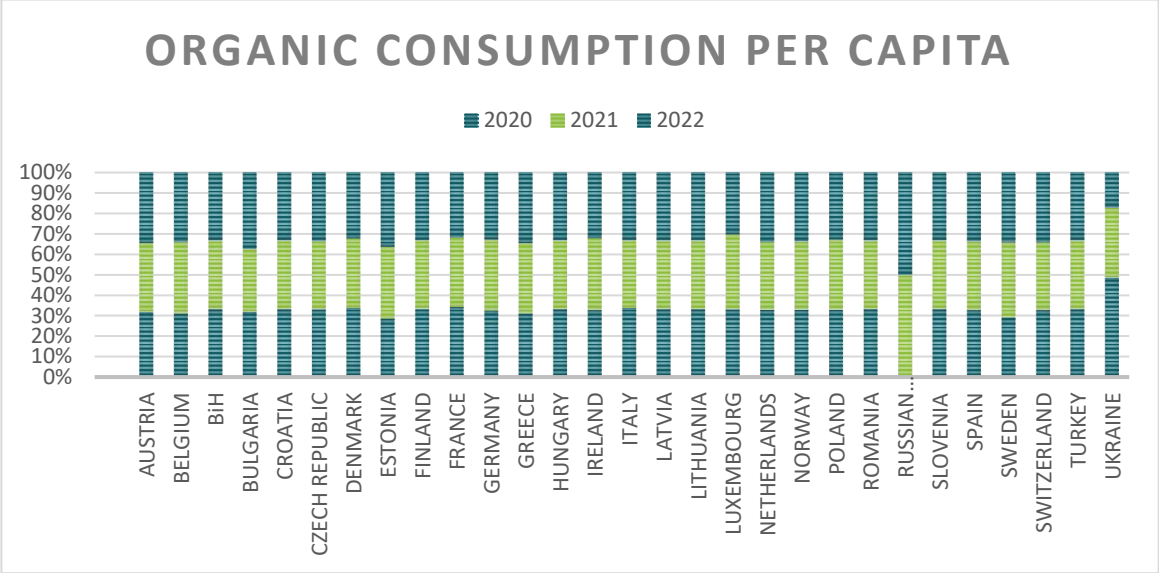


Figure 2: Figure showing the percentage of organic consumption per capita in the three-year period 2020-2022

In Europe and the EU, arable land is the most important land use type, accounting for 45% of organic farmland, followed by permanent grassland at 40% and permanent crops at 13%. The primary arable crop group was cereals, covering 2.9 million hectares in European countries. Permanent crops and olives occupied 0.6 million hectares.
All these statistics indicate the potentials for the development of the organic seed production and cultivar testing.
Figures 3, 4 and 5 show agricultural land use in organic agriculture by the top ten countries in 2022.

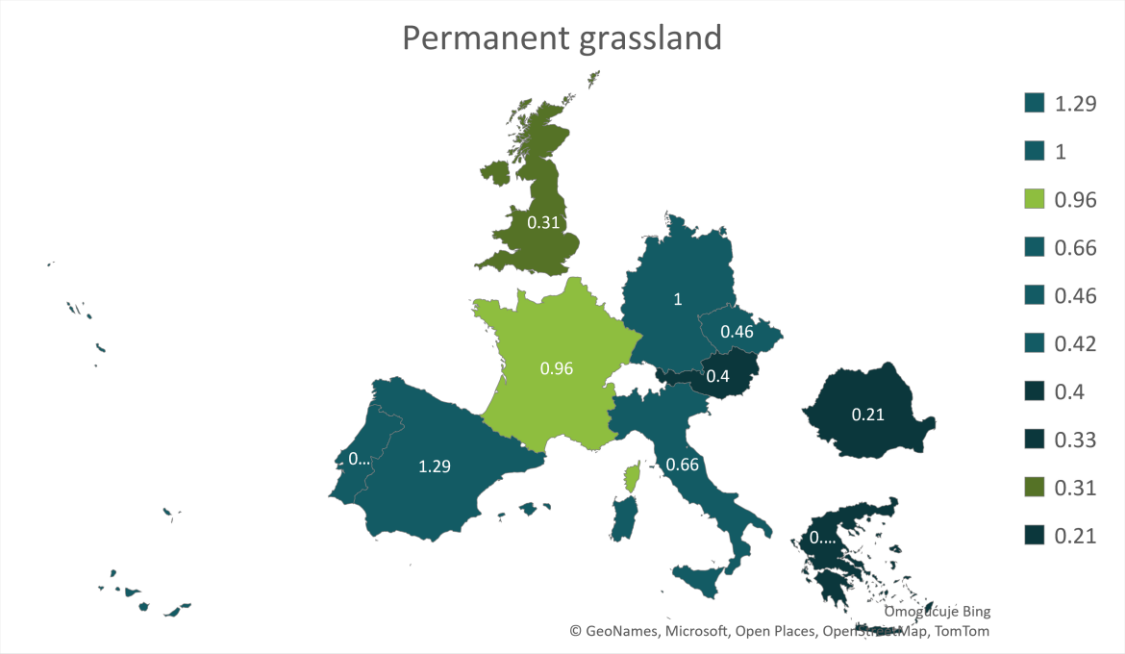


Figure 3: Land area under permanent organic grassland in Europe (million ha)

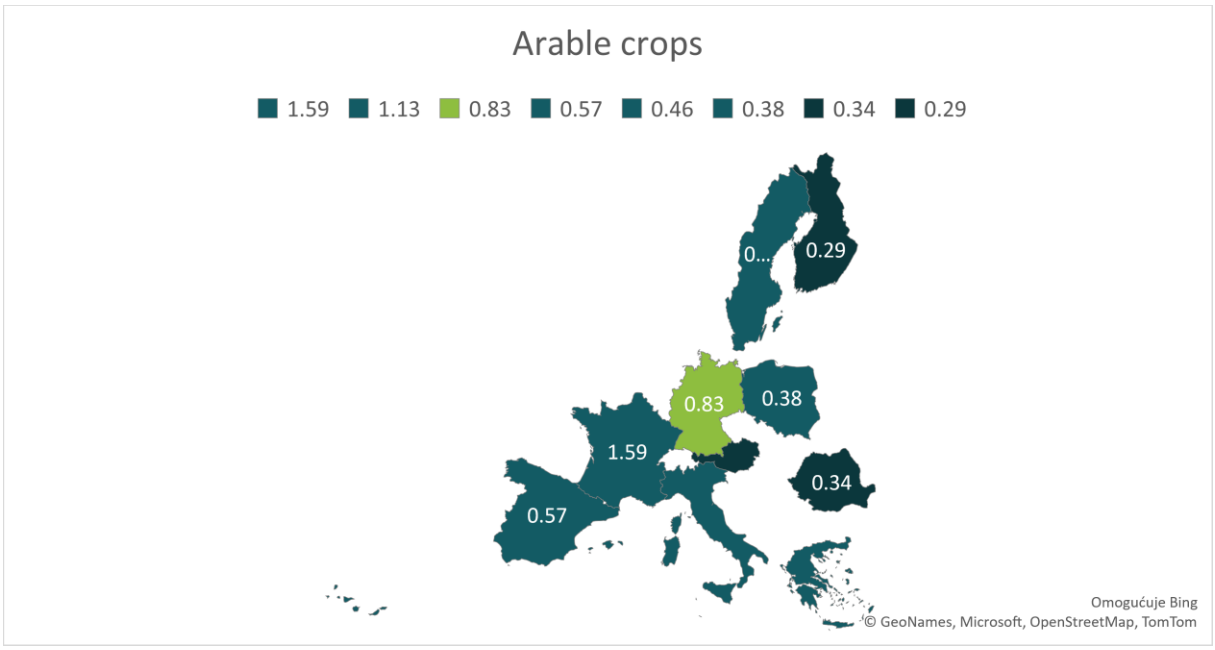


Figure 4: Land area under organic arable crops in Europe (million ha)

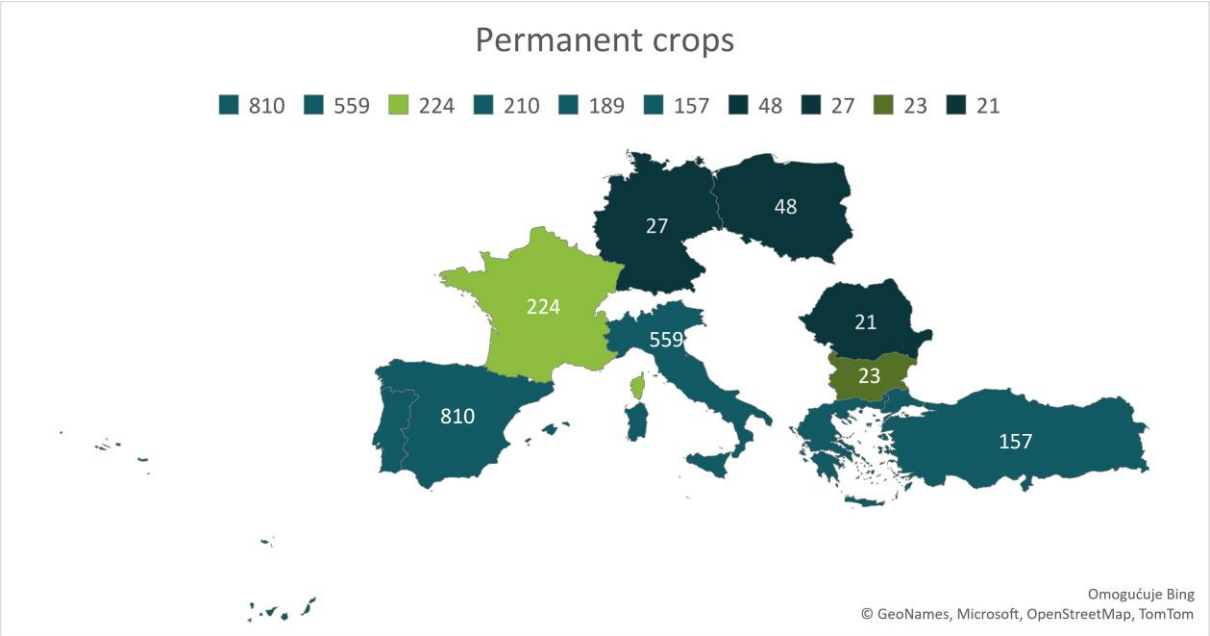


Figure 5: Land area under organic permanent crops in Europe (thousand ha)

(The World of Organic Agriculture - Statistics and Emerging Trends 2024 (orgprints.dk))

Organic seed production and cultivar testing

Seed production is the primary step in setting up a fully organic production system**.** Moreover, producing organic seeds is crucial in supporting food diversity and security, as By cultivating and multiplying a wide range of organic seed varieties, farmers contribute to a wide array of genetic material available for future breeding and adaptation. Plant diversity is vital as it allows plants to evolve in response to climate change, pest pressure, and other environmental challenges, offering resilience in times of uncertainty (Panzaru R.L. et al., 2023, link).

The production of organic seeds in Europe is closely tied to the broader trends in organic farming, which has seen consistent growth across the continent.

Regulations surrounding organic seed use are becoming more stringent. Under current EU legislation, organic farmers are required to use organic seeds when available. However, due to limited supply, they can still rely on conventionally bred and/or produced seeds under specific derogation systems. This flexibility is set to diminish as the new EU Organic Regulation (Regulation (EU) 2018/848), which came into effect in January 2022, aims to phase out these derogations by 2036, pushing the organic sector to develop a more robust seed supply. The European Commission's "Farm to Fork" strategy, part of the European Green Deal, sets ambitious goals to make at least 25% of EU farmland organic by 2030. Achieving this target will require a significant increase in the availability of organic seeds and a more substantial

investment in breeding programs in the frame of organic farming practices. It suggests that dialogue among stakeholders is critical in initiating new methodologies and approaches to obtain accurate, complete, and reliable data on the organic seed market. (Solfanelli i sur., 2022).

Furthermore, initiatives such as the LIVESEED project, funded by the European Union's Horizon 2020 program, aimed to strengthen the production and use of organic seeds by improving coordination among farmers, seed companies, and researchers. The project's findings indicated that while organic seed production has made strides, there is still a need for greater diversity in seed varieties to address different climate zones, pests, and soil conditions across Europe. This, combined with efforts to increase transparency in organic seed databases and remove specific legal barriers, is critical for meeting the EU's 2030 goals and supporting the long-term sustainability of organic farming.

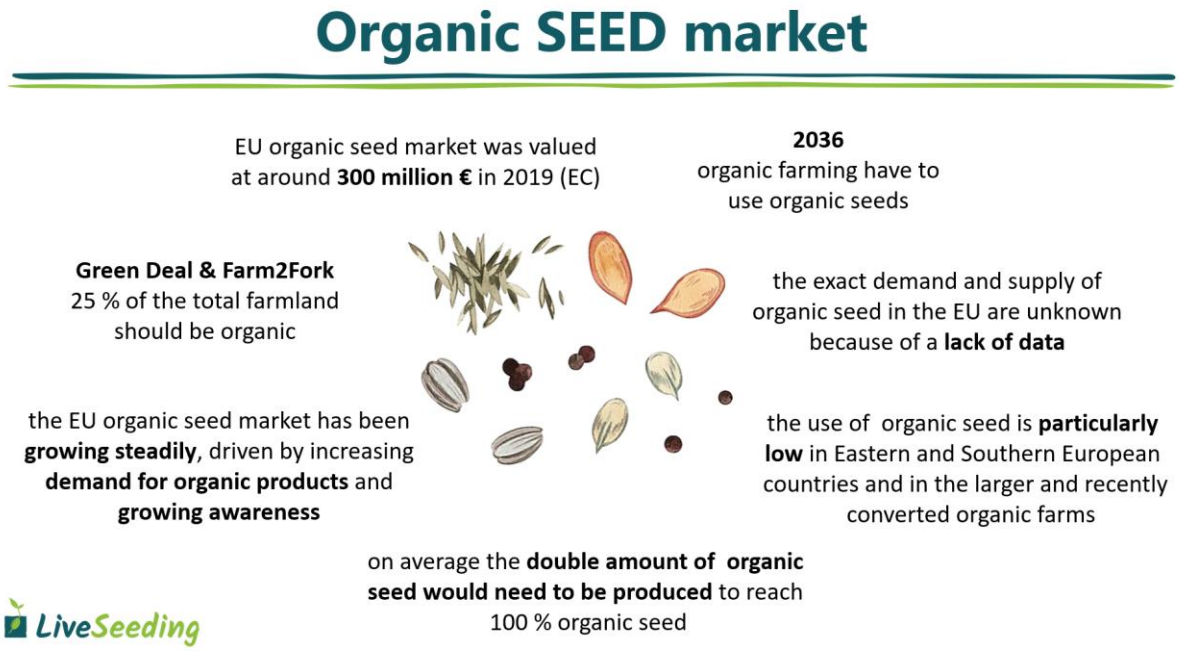


Figure 6 Overview of the organic seed market

It is challenging to find reliable and comprehensive data on the status and areas under organic seed production. A lack of accurate and consistent information about both the demand and supply of organic seeds makes it difficult to assess the current market landscape. Insufficient data about organic seed production and use is among the key factors affecting the current development of the organic seed market in the EU. Since the organic seed market has developed, increases the need for statistical data in sufficient quantity and of appropriate quality to enable decision-making and can no longer be ignored. This data gap creates uncertainty for businesses, policymakers, and producers who rely on such insights to plan and expand organic seed production effectively.

Seed suppliers, producers and breeders need the information to make appropriate investment decisions and will only invest in developing new supplies of organic seed if the possibility of derogations does not stifle demand.
Finally, policymakers need information on seed production and use to monitor when the target of 100% organic seed could be reached and to determine the appropriate level of regulation and support measures for the sector. (Solfanelli i sur., 2022). That is also one of the reasons why LiveSeeding decided to release a survey to collect updated information directly from the organic seed and cultivar testing sector.

2. Methodology & scope

The methodology for each of the activities executed will be briefly explained. This report contains four main segments. The first one is the analysis of the SWOT interviews conducted with multiple actors from 10 countries, where an initial insight into the market conditions is collected. The next step was conducting a survey that collected more than 140 responses from more than 20 countries and made a structured insight into diverse factors of impacts that influence sector development. After that, two workshops were organised to affirm the level of understanding of the results obtained. Last but not least, an innovative methodology called "Business Birdview" was applied to make results easily understandable. The Business BirdView concept focuses on the key aspects of the SWOT and Business Model Canvas segments and results in profitability and recommendations guidelines.

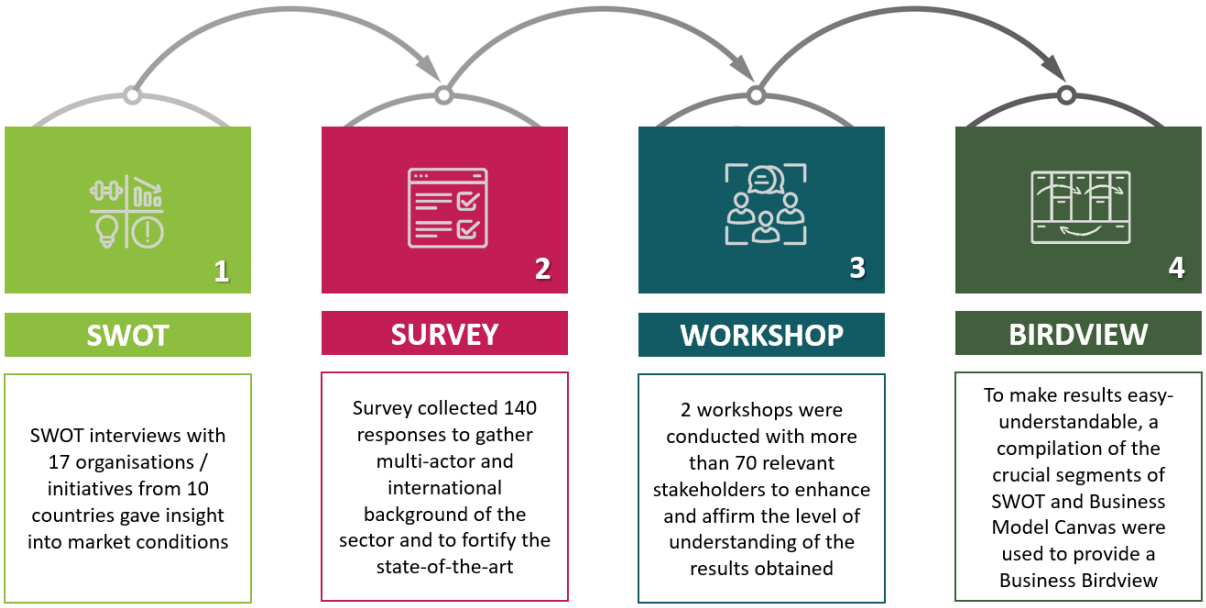


Figure 7 Structure of the report

Within the context of this report, the following definitions are being applied:

Companies refer to profit-driven entities that focus on seed production and distribution. Their focus is more on technological growth to enhance production alongside the diversification of products and profitability.

Initiatives are often collaborative "projects" that promote innovation, sustainability, and biodiversity conservation, frequently funded by various sources. Initiatives emphasise collaborative innovation and prioritise innovative breeding techniques such as OHM.

Research centres are specialised public or private institutions dedicated to scientific research and development. They focus on advancing agricultural practices, cultivar evaluation, and knowledge dissemination through partnerships with industry and academia. Their uniqueness lies in their specialized methods and strong research infrastructure.

Regarding the geographical typology, the project used the same principle as the previous LIVESEED project. These regions have been identified and used to explain the differences: Northern Europe (Sweden, Finland, Latvia), Eastern Europe (Poland, Hungary, Slovenia, Serbia, Romania, Bulgaria), Central Europe (Netherlands, Belgium, France, Switzerland, Liechtenstein, Austria, Germany, Luxembourg), and Southern Europe (Portugal, Spain, Italy, Croatia, Greece).

2.1 SWOT analysis

To prepare a SWOT analysis, 17 interviews were conducted with relevant small, medium, and large seed enterprises and the associations and initiatives involved in cultivar testing activities. The interviews were conducted from the end of February 2024 until mid-May 2024 and covered 10 countries.

When organising SWOT interviews, the aim was to include diverse actors and representatives of the organic seed and plant breeding sector and cultivar testing networks in terms of geographical scope, type of crops, type of production, size of the enterprise, etc.

Interviews were conducted with 12 seed enterprises, two research/governmental organisations, and three initiatives (cultivar testing sites). Considering the geographical outreach (categorisation based on geographical location and cultural similarities of individual countries), interviews were conducted with three representatives from Northern Europe (Finland, Lativa, Sweden), six from Eastern Europe (Bulgaria, Poland, Romania, Hungary, Slovenia, Serbia), seven from Central Europe (Austria, France, Germany, Belgium, Luxembourg, the Netherlands, Switzerland), and most of them (5) from Southern Europe (Spain, Italy, Portugal, Croatia and Greece).

A concept for SWOT interviews with seed producers (Annex I) and cultivar testing networks (Annex II) has been developed in advance with support from other T5.1

involved partners (RCxAe, FiBL-CH, ITABA more), and it served as a basis for the semi-structured interviews implementation. During the interviews, the aim was to gather information on the following elements of the companies' business and overall activities: general profiling (type of production, ratio of organic/conventional, length of existence, workforce, etc.), resources/production (capabilities, experience, knowledge, processes, etc.), marketing and communication channels and strategies, market and sales, approach to business planning, assessment and implementation of technology, attitudes towards policy and regulatory framework and interest for partnerships. A more detailed overview of the interview concept is indicated in Annex I and Annex II.

Furthermore, a protocol for T5.1 interviews with organic seed producers and cultivar testing networks has been prepared before the interviews. The document provides general information and guidelines for conducting the interviews, such as interview characteristics, interviewing period, and implementation steps.

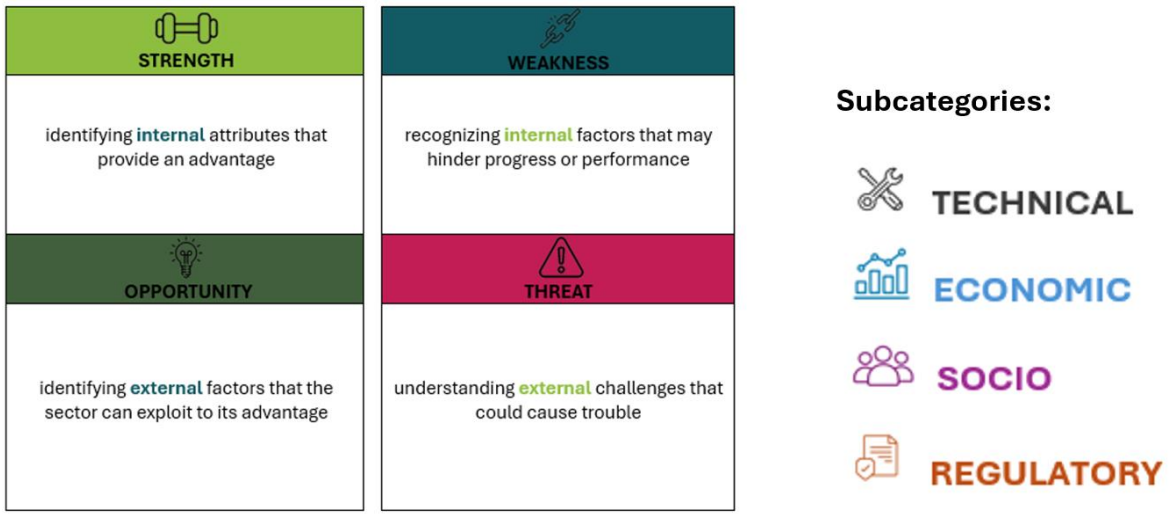


Figure 8 Visual model of SWOT analysis and subcategories used

This SWOT analysis's uniqueness lies in its breakdown into the traditional categories of Strengths, Weaknesses, Opportunities, and Threats and in its integration of four additional subcategories, which are visually differentiated using colour coding. These subcategories are (i) technical, (ii) economic, (iii) socio and (iv) regulatory.

Table 1 Overview of subcategories for SWOT analysis

	Technical	This category focuses on technology, innovation, and technical processes, such as adopting digital tools, advanced production systems, and technical expertise within the organisation.
	Economic	This category addresses financial sustainability, cost-efficiency, market competitiveness, and funding, highlighting how economic factors influence strengths, weaknesses, opportunities, and threats.

	**Socio**	The social dimension examines workforce issues, customer and stakeholder relationships, and societal challenges trends, including workforce retention, customer engagement, and public awareness of sustainable practices.
	**Regulatory**	This category focuses on compliance with laws, standards, and policies, particularly those related to organic certification, governmental subsidies, and European seed regulations.

This nuanced approach allows for a multidimensional understanding of the internal and external factors affecting the organisation, providing a comprehensive analysis that considers the technical, economic, social, and regulatory contexts within each SWOT element.

The elements included in the SWOT are not necessarily shared by all the initiatives interviewed, but they have been integrated to showcase the diversity of opinions derived from different contexts and approaches.

The information gathered through the interviews will also be valuable input for developing the business plans and models in the later stages of the project (T5.5).

2.2 Survey on the European Organic Seed and Breeding Sector

The "**Survey on the European organic seed and breeding sector**" was prepared and implemented using a Survey Sparrow app. The main aim of the survey was to detect technical, economic, and regulatory challenges that organic seed producers, organic breeders and cultivar testing networks face today and analyse market opportunities that new organic challenges are imposing for the upcoming years.

The survey has been prepared in English and translated into 10 consortium languages (Polish, English, Romanian, German, Greek, French, Italian, Croatian, Spanish, Slovenian). The translation enabled the participation of a wide variety of initiatives from different cultural, geographical, and socio-economic contexts in the survey.

The survey consists of 51 questions, divided into three main parts: (i) general profiling, (ii) the EU organic seed and breeding market and (iii) analysis of economic, technical, regulatory and encouragement segments of organic seed production.

The questionnaire comprised a variety of question types designed to elicit comprehensive insights. It included single-choice and multiple-choice questions. Additionally, a section was dedicated to rating the importance of specific factors affecting business operations to gauge the perceived significance of each factor. The survey also incorporated open-ended questions, allowing respondents to input their responses, thereby enabling the collection of qualitative data and more nuanced perspectives. This diverse structure ensured a robust analysis of quantitative and qualitative elements relevant to the study.

The survey aimed at two key stakeholder groups:

Organic seed producers/traders or breeders that produce and/or trade seeds (including farmers and small, medium and large-scale companies)

Conventional seed producers/traders or breeders that plan to produce/trade organic seeds in the future (including farmers and small, medium and large-scale companies that producer/trade seeds).

The survey was widely distributed among European stakeholders using different communication channels and media, including direct contact via email and newsletter, publishing on social media, and presenting at different partners' events and conferences.

2.3 Stakeholder workshop

The workshop "Market opportunities and economic challenges for organic seed producers" was successfully implemented in February 2023.

More than 60 organic seed-sector participants gathered to discuss the main technical, economic, and regulatory challenges that organic seed producers face. The workshop participants fruitfully discussed the main obstacles and needs in different segments of organic seed production, potential solutions, and ways to encounter those challenges.

The brainstorming session divided participants into groups of up to 12 people per breakout room, and project experts moderated sessions. The discussion was done on several levels, focusing on (i) economic challenges, (ii) regulatory challenges, and (iii) technical challenges.

The final segment of the workshop involved conducting an 8-question survey with a DirectPoll, in which attendees were asked about potential solutions for today's challenges in organic seed production and cultivar testing.

2.4 Business Birdview (BB)

To systematise all the information collected through the survey, the workshop, and the SWOT interviews, presenting it simply and laying the groundwork for constructing models and business plans in T5.5, a new "Business Birdview" (BB) tool has been developed. The "Business Birdview" template provides a streamlined, holistic view of a business by integrating internal and external challenges, opportunities, and key strategic elements.

It combines insights from SWOT analysis and the Business Model Canvas into three sections: (i) Challenges of Today, identifying internal and external bottlenecks; (ii) Sounds Like Opportunity", highlighting growth opportunities, unique value propositions, and customer strategies; and (iii) "Future is Organic", focusing on profitability and strategic recommendations.

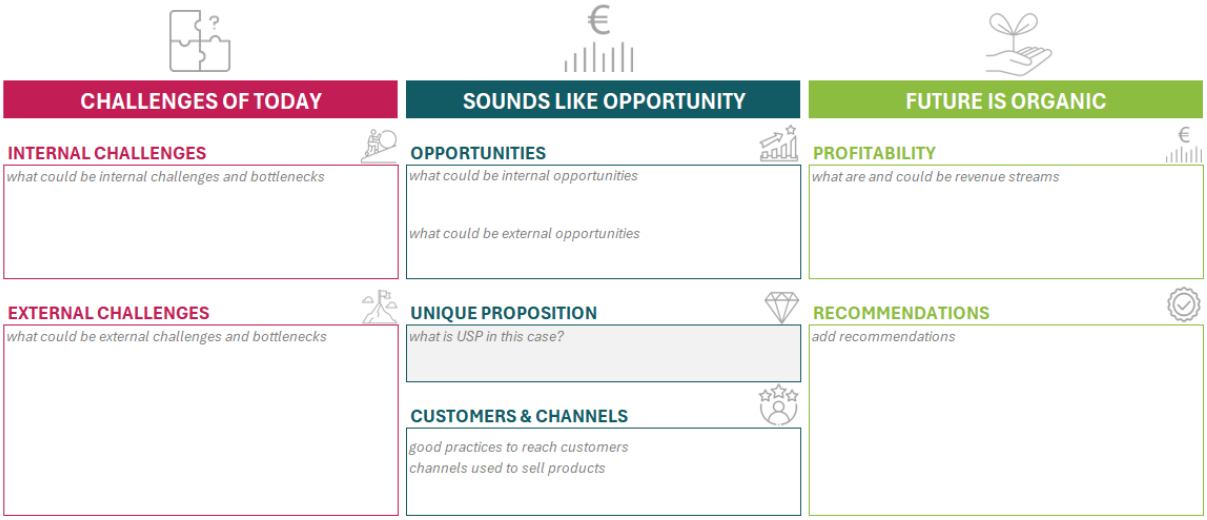


Figure 9 Visual representation of a "Business Birdview" model

This approach simplifies complex business analysis, making insights easily digestible for stakeholders and aiding in more informed decision-making.

3. Results and discussion

3.1 SWOT analysis of organic seeds producers and cultivar testing networks

The organic seed market and cultivar testing networks were analysed as part of a broader effort to identify key obstacles and opportunities for scaling up the sector at the national and European levels.

A SWOT analysis is a strategic planning tool for identifying and assessing the internal and external factors that can impact an organisation or project. The acronym SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. Strengths and weaknesses are internal factors, such as resources, capabilities, or limitations within the organisation, while opportunities and threats represent external factors like market conditions, competition, or regulatory changes.

One of the key advantages of a SWOT analysis is its simplicity and flexibility. Offering a holistic view of the internal and external environment fosters a better understanding of an organisation's position in the market. Furthermore, it encourages a thorough evaluation of positive and negative factors, ensuring a balanced perspective. Moreover, it helps prioritise actions by highlighting areas where the organisation can make the most impact.

The SWOT analysis is based on 17 interviews conducted with initiatives from 10 EU member states representing 4 EU regions: Northern Europe, Western Europe, Central Europe, and Southern Europe *(Table 2 Overview of SWOT interviews conducted;*

Figure 10 Overview of countries presented in the SWOT analysis, based on interviews).

Figure 10 Overview of countries presented in the SWOT analysis, based on interviews

Table 2 Overview of SWOT interviews conducted

Enterprise/initiative; seed production/cultivar testing	Country	Region typology	Crop type	Organic/ conventional
Enterprise, seed production	Germany	Central EU	Vegetables, herbs, flowers, green manure	Organic
Enterprise, seed production	Lithuania	Northern EU	Cereals	Organic, conventional
Enterprise, seed production	France	Western EU	Cereals, legumes	Organic
Enterprise, seed production	Greece	Southern EU	Cereals, vegetables, legumes	Conventional
Initiative, seed production	Spain	Southern EU	Vegetables, flowers and medicinal plants	Organic
Enterprise, seed production	Spain	Southern EU	Vegetables	Organic, conventional
Enterprise, seed production	Italy	Southern EU	Vegetables	Organic, conventional
Enterprise, seed production	Italy	Southern EU	Vegetables, cereals, legumes	Organic
Enterprise, seed production	Italy	Southern EU	Vegetables, cereals	Organic, conventional
Enterprise, seed production	Portugal	Southern EU	Vegetables, herbs, flowers, legumes	Organic
Enterprise, seed production	Germany	Central EU	Vegetables, cereals, sugar beet, oil plants	Organic, conventional
Enterprise, seed production	Poland	Central EU	Cereals, legumes, grasses	Organic, conventional

Enterprise, seed production	The Netherlands	Western EU	Vegetables	Organic
Initiative, cultivar testing	Spain	Southern EU	Vegetables	Organic
Research organisation, cultivar testing	United Kingdom	Western EU	Cereals, legumes	Organic
Initiative, cultivar testing	France	Western EU	Cereals	Organic
Governmental and research organisation, cultivar testing	Poland	Central EU	All agricultural crops	Organic, conventional

This report contains an overview analysis of all interviews per typology selected. There are three main typologies used for this matter (

To systematise all the information collected through the survey, the workshop, and the SWOT interviews, presenting it simply and laying the groundwork for constructing models and business plans in T5.5, a new "Business Birdview" (BB) tool has been developed. The "Business Birdview" template provides a streamlined, holistic view of a business by integrating internal and external challenges, opportunities, and key strategic elements. It combines insights from SWOT analysis and the Business Model Canvas. This approach simplifies complex business analysis, making insights easily digestible for stakeholders and aiding in more informed decision-making.

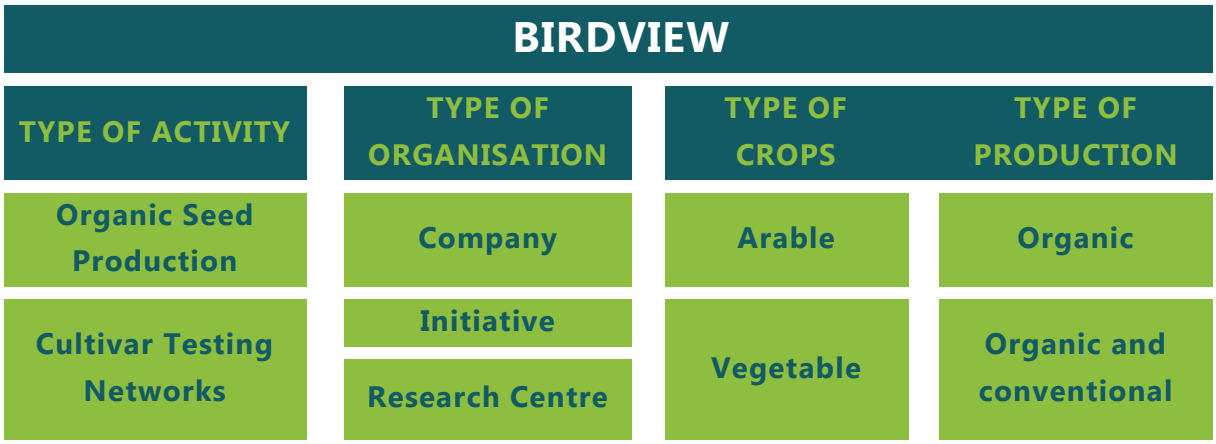


Figure 11 Overview of typologies used for SWOT analysis):

(i) Type of activity - Organic Seed production and Organic Cultivar Testing Networks

(ii) Type of organisation – Company, Initiative, Research Centre

(iii) Type of crops – Arable, Vegetable

To systematise all the information collected through the survey, the workshop, and the SWOT interviews, presenting it simply and laying the groundwork for constructing models and business plans in T5.5, a new "Business Birdview" (BB) tool has been developed. The "Business Birdview" template provides a streamlined, holistic view of a business by integrating internal and external challenges, opportunities, and key strategic elements. It combines insights from SWOT analysis and the Business Model Canvas. This approach simplifies complex business analysis, making insights easily digestible for stakeholders and aiding in more informed decision-making.

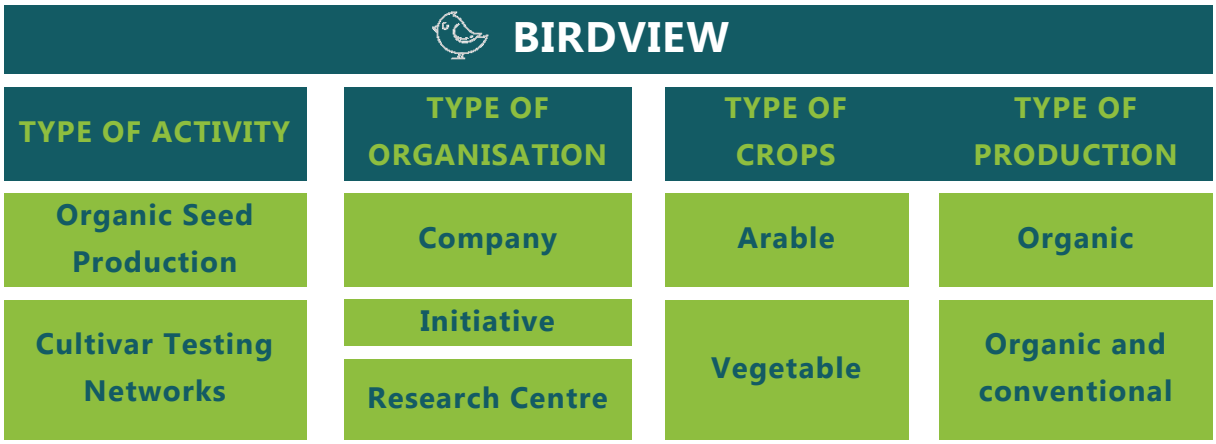


Figure 11 Overview of typologies used for SWOT analysis

An **organic seed producer** is a company or organisation that cultivates, processes and sells seeds produced according to organic farming principles. These producers follow strict organic guidelines, ensuring no synthetic pesticides, fertilisers, or genetically modified organisms (GMOs) are used in seed production. The goal is to supply high-quality organic seeds suitable for organic agriculture and also in other forms of production that transition towards sustainability.

A **cultivar testing** network is a system or organisation that evaluates and tests different plant varieties or populations (cultivars) to determine their performance in various conditions, such as climate, soil types, and organic farming practices. These networks often collaborate with breeders, researchers, and farmers to provide data on

which cultivars are best suited for organic production, helping improve crop yields, resilience, and overall sustainability in the organic farming sector.

3.1.1 SWOT analysis – comparison of organisation type

To better understand the similarities and differences between different organisation types dealing with seed production and cultivar testing, the SWOT analysis, and later also a bird view analysis, was conducted based on the following categories:

1. Company
2. Initiative
3. Research Centre

Within this report, **companies** refer to profit-driven entities that focus on seed production and distribution. In contrast, **initiatives** are often collaborative "projects" that promote innovation, sustainability, and biodiversity conservation, frequently funded by various sources. **Research centres** serve as specialised institutions, public or private, dedicated to scientific research and development, focusing on advancing agricultural practices, cultivar evaluation, and knowledge dissemination through partnerships with industry and academia.

The comparative analysis of the company, initiative, and research centre SWOTs shows notable differences in how each entity type operates.

Companies focus on advanced technologies like drones and IT systems to enhance production alongside the diversification of products. However, it faces challenges with high production costs and lack of succession or an ageing workforce yet leverages government funding and EU support as opportunities.

Initiatives prioritise innovative breeding techniques (such as OHM, participatory breeding, culinary breeding etc.) and operate in a well-organized seed sector. They face issues with low staff numbers and complex regulations but also see opportunities in digital expansion and global market reach.

Research Centres have unique testing methods and a strong research infrastructure. They face challenges like slow decision-making and reliance on grants. Their opportunities lie in international partnerships and sustainability initiatives, though they face threats from policy changes and limited organic markets.

Overall, the "companies" focus more on technological growth and profitability, while the "initiatives" emphasize collaborative innovation. The "research centres" are more dedicated to scientific development, sustainability, and research partnerships.

TECHNICAL ECONOMIC SOCIO REGULATORY

STRENGTH

- Investment in IT systems for seed management and sales
- Use of advanced technology like drones and Plant Information systems
- Strong focus on R&D and breeding programs
- Infrastructure investment for seed production and research activities
- Consistent growth and profitability
- Financial stability and investment in infrastructure
- Diversification of product range to meet market demands
- Cost efficiency and cost savings through collaboration with other members of the network
- Collaboration with growers, universities, and research institutions
- Compliance with organic standards and certifications
- Strategic partnerships and collaborations
- Adherence to national and international seed laws

WEAKNESS

- Challenges in recruiting and retaining qualified personnel, particularly in rural areas
- High production costs, especially for labour-intensive activities
- Difficulty in integrating new digital technologies due to workers' resistance
- Inadequate internal resources and financial constraints limiting technological investments
- Reliance on external suppliers (e.g. lab services, seed cleaning)
- Dependency on subsidies and external financial assistance, posing risks if funding is reduced or unavailable
- Vulnerability to market conditions and economic fluctuations impacting demand
- High costs associated with R&D, limiting scalability and financial flexibility
- Financial instability due to inefficiencies in revenue generation and cost management
- Surplus inventory and high stock levels leading to storage issues and financial strain
- Ageing workforce with limited influx of younger employees or lack of succession
- Seasonality of agricultural work leading to difficulties in offering permanent employment and retaining skilled personnel
- Limited knowledge among farmers about the benefits of organic seeds, impacting market adoption
- Challenges in building and maintaining customer relationships due to lack of effective communication strategies and marketing efforts
- Complex and time-consuming regulatory requirements for organic certification and transition from conventional to organic production
- Need for adherence to strict organic certification standards, adding complexity and potential delays to the conversion process

OPPORTUNITY

- Enhancing operational efficiency, data management capabilities, and decision-making processes through innovative technologies
- Adapting to climate change and improving nutritional value to meet market demands and consumer trends
- Innovating and improving production techniques through collaboration with researchers, universities, and other organisations
- Capitalizing on the growing demand for organic products, including seeds, by diversifying offerings and entering new markets
- Engaging with other businesses, research groups, and policymakers to exchange knowledge, drive innovation, and highlight the importance of organic farming
- Rising interest in organic and biodynamic products among consumers, including hobby gardeners and environmentally conscious customers
- Transitioning to organic seed production in line with EU policies and regulations

THREAT

- NGTs pose threats to organic seed production as many conventional companies may shift to these methods
- Potential adverse effects of climate change on agricultural productivity and seed production
- The complexity and high costs of adhering to stringent organic regulations
- Decreasing government subsidies for the organic sector and uncertainty about future financial support
- Increasing competition regardless of the company type and size
- Economic fluctuations and inflation affecting seed prices and demand
- Challenges in finding and retaining skilled employees
- Insufficient public awareness regarding organic farming practices
- Low awareness and lack of consciousness among farmers about the seeds they use
- An ageing population and potential lack of young talent entering the seed industry
- Stringent and costly organic regulations (including e.g. plant passports and DUS protocols)
- Regulatory changes and compliance challenges related to organic farming standards and seed certification.
- Bureaucratic hurdles and paperwork slowing down operations and increasing operational costs

Figure 12 SWOT analysis – organisation type: company

TECHNICAL ECONOMIC SOCIO REGULATORY

STRENGTH

- innovative breeding approaches to democratise breeding efforts and preserve biodiversity
- funding from various sources e.g. training station funds, regional subsidies, foundations
- in some cases, lower number of competitors in the region
- effective collaborations and partnerships with different stakeholders - e.g. farmers, bakers, professionals
- operating within a well-organized seed sector

WEAKNESS

- small number of employees, often understaffed
- relying on public subsidies and external funds (vulnerability to changes in funding schemes and funds availability)
- recruiting and retaining seed multipliers pose ongoing challenges
- complex regulations governing seed production

OPPORTUNITY

- incorporating digital tools and technologies could streamline communication, data analysis, and knowledge-sharing processes
- invest in innovation and technology
- expand market reach by leveraging online platforms
- collaborating with research stations can enhance breeding efforts and improve the quality of seed varieties
- parthership with governmental agencies, NGOs and other stakeholders to enhance its conservation efforts
- collaborating with research agricultural organisations that focus on preserving agricultural cultivars

THREAT

- impact of climate change
- increased competition from larger entities may undermine effort
- economic downturns or changes in funding priorities could hinder financial sustainability
- it is often the case that there is a lack of subsidy schemes and it is difficult to approach to the existing government subventions
- shifting consumer preferences and market trends affect demand for local plant varieties
- changes in seed production and certification regulations will have a direct and powerful impact
- patent regulations
- sanitary standards not adapted to organic production

Figure 13 SWOT analysis – organisation type: initiatives

CASE: RESEARCH CENTER

TECHNICAL | ECONOMIC | SOCIO | REGULATORY

STRENGTH

- unique and robust method for cultivar evaluation
- numerous testing stations covering extensive geographic and environmental conditions
- core team of researchers
- organises field days that gather significant number of relevant stakeholders
- stable financial foundation (flexible founding model)
- strong relationship with breeders, seed producers, political entities and international bodies
- collaborating with well-established network of organic arable farmers, researchers and seed companies

WEAKNESS

- small market for organic varieties
- sometimes experience a small number of knowledgeable staff - vulnerability to personnel changes
- extensive network
- multiple levels of hierarchy - slower decision-making processes
- internal and external communication could be improved in some cases, to enhance information sharing and stakeholder engagement
- relying heavily on public research grants

OPPORTUNITY

- integrate digital tools (e.g. drones) to enhance the efficiency of cultivar evaluation processes
- membership fees to ensure financial sustainability
- increasing public awareness about the benefits of certified varieties and sustainable practices
- forming strategic partnerships with industry leaders seed companies to diversify funding and expand research capabilities
- parthership with government bodies to secure better funding and support for organic agriculture
- strengthening ties with international bodies
- advocacy for favourable policies and regulations at the national and EU levels

THREAT

- limited market for organic products
- unpredictable weather patterns and climate change
- reliance on short-term grants poses a risk to long-term project continuity and financial stability
- economic downturns could lead to reduced funding
- increased competition for sustainable agriculture funding from other organisations
- policy changes prioritising other sectors over agriculture or focusing on larger agricultural actors
- changes in national or EU regulations could require significant adjustments

Figure 14 SWOT analysis – organisation type: research centre

3.1.2 SWOT analysis of organic seed producers

Strengths include integrating advanced IT systems, significant investments in infrastructure and R&D, and strong collaborations with universities and research institutions. Many companies benefit from a wide range of crop types, international customer relationships, and direct engagement with customers. The emphasis on organic seed production, sustainability, and compliance with regulatory standards also positions them well in the growing organic market.

However, the sector faces notable internal **challenges**, including high production costs, difficulties recruiting skilled personnel in rural areas, and a lack of succession or an ageing workforce, which seems to be an overall problem of European agriculture. Financial instability due to dependency on subsidies, high research costs, and limited investment opportunities also present significant obstacles. Additionally, employees are sometimes reluctant to adopt advanced technologies. Next is the seasonal nature of work and complex regulatory requirements that further constrain growth and innovation.

On the **opportunity** side, rising demand for organic products, new international market expansion, and participation in research and development projects provide significant growth potential. Collaborations with other seed companies and research institutions can drive innovation, while alignment with EU organic regulations supports market positioning.

Nevertheless, **threats** such as rapid technological advancements, competition, economic fluctuations, and climate change pose risks to profitability and market stability. Regulatory changes, including decreasing government subsidies, complex certification processes create additional challenges for seed producers and traders. Balancing these factors will be crucial for sustaining growth and adapting to the evolving market landscape.

CASE: SEED PRODUCERS AND TRADERS

TECHNICAL | ECONOMIC | SOCIO | REGULATORY

STRENGTH

- highly skilled and qualified employees, online database, own breeding program
- having own departments such as laboratories, seed storage, facilities
- business plans developed annually
- using drones and PI system
- well-established marketing strategy
- strong financial foundation
- hosting open field days and offering consulting services
- cooperation with growers and universities in terms of research activities
- connection to the farming community
- importance of customer satisfaction
- active in political aspects

WEAKNESS

- problem with finding experts
- older workforce
- lack of communication, commercial departments and marketing strategy - low brand visibility
- dependency on external financial assistance, bank loans and EU subsidies for financial stability
- non-profitable business model - financial instability
- research is expensive, and there are too little subsidies by the state
- high production costs for organic farming
- difficulty of competing with the big EU seed companies
- regulatory requirements are time-consuming and require a lot of paperwork

OPPORTUNITY

- financing through business activities
- government funding for further research
- investing in advanced technology help to stay ahead competitors
- collaboration with policymakers
- growing demand for organic and biodynamic products
- collaborations with companies in developing and marketing high-quality seeds and products as well as developing new crop varieties adapted to climate change
- changes in policy frameworks
- streamlined bureaucratic processes can facilitate faster market entry, regulatory compliance and business operations

THREAT

- climate conditions pose a threat for agricultural productivity
- high prices in specific fields due to eventual high labour requirements in organic (e.g. weeding)
- economic fluctuations and inflation impacting seed prices and demand
- lack of subsidy schemes
- decreasing government subsidies
- consumer awareness and concern about GMOs and NGTs may affect purchasing decisions
- high competition and associated costs
- rapid changes in the market requires agility and adaptation to remain competitive
- uncertainties regarding the regulatory framework
- changes in EU subsidy policies might reduce financial support and lack of adequate support for organic production

Figure 15 SWOT analysis - seed producers and traders

3.1.3 SWOT analysis of cultivar testing networks

The SWOT analysis for seed cultivar testing networks highlights their core strengths and challenges in an evolving agricultural landscape. Network **strengths** are in technical expertise, particularly in cultivar evaluation and testing, supported by a team of researchers. They enjoy financial stability thanks to diverse funding sources, including state budgets, regional subsidies, and even European Union grants. Strong partnerships with local farmers and communities and alignment with EU standards often strengthen their position in the organic seed sector.

As the **weaknesses**, these networks struggle with a shortage of specialised personnel and an overreliance on public grants and subsidies. Recruitment and retention of skilled employees are ongoing issues, as is the dependence on a few key experts. Moreover, the complexity of regulations governing seed production and certification adds administrative burdens, creating potential operation bottlenecks.

Opportunities lie in embracing new agricultural technologies, such as drones and automated systems, to enhance the efficiency of cultivar evaluation processes. The integration of digital tools can streamline operations and improve communication and knowledge-sharing. Expanding revenue streams through partnerships with industry stakeholders, online platforms, and export markets also presents a path for financial growth. Collaborating more deeply with research institutions and government bodies offers a chance to secure additional support, particularly for biodiversity conservation and organic agriculture initiatives.

External **threats** loom large, such as climate change, which could disrupt local crop varieties and cultivar trials. Economic uncertainty and fluctuations in grant funding threaten financial stability. Additionally, evolving patent regulations and sanitary standards could further hinder the network's activities and market access.

CASE: CULTIVAR TESTING

TECHNICAL | ECONOMIC | SOCIO | REGULATORY

STRENGTH

- Technical Extensive expertise in cultivar evaluation and testing (cultivar evaluation methods, team of researchers)
- Financial stability from diverse funding sources (State budget, regional subsidies, foundations, etc.)
- Strong partnerships and community engagement (engages with farmers and local communities, network of organic farmers, field days)
- Alignment with national and EU standards (receiving funding from the European Union, complying with EU rules)

WEAKNESS

- Lack of specialized workforce
- Reliance on public grants or subsidies
- Vulnerability to fluctuations in funding availability
- Recruitment and retention challenges for specialized employees
- Heavy reliance on a small number of knowledgeable employees

OPPORTUNITY

- Leveraging advancements in agricultural technology (e.g., drones, automated seed processing systems, digital traceability tools)
- Incorporating digital tools and technologies to streamline processes (e.g., data analytics, digital tools for communication and knowledge-sharing)
- Enhancing efficiency of cultivar evaluation processes through technological integration
- Exploring alternative revenue generation channels (e.g., online platforms, membership fees)
- Diversifying income streams through strategic partnerships with industry leaders and stakeholders
- Engaging and educating breeders and farmers about sustainable and organic practices
- Capacity-building initiatives to improve cultivation techniques and seed quality
- Strengthening ties and collaborations with research stations, NGOs, and other stakeholders
- Raising awareness about biodiversity conservation and the benefits of certified organic varieties
- Engaging in dialogue with government bodies to secure better funding and support for organic agriculture initiatives
- Promoting favorable policies for biodiversity preservation and participatory breeding programs

THREAT

- Impact of climate change on agricultural ecosystems threatens the viability of local varieties and the consistency and reliability of variety trials
- Economic crisis and uncertainty can lead to reduced funding and financial instability, impacting operations and project continuity
- Fluctuations in grant funding pose a threat to financial sustainability and operational continuity
- Competition from larger agricultural enterprises or commercial seed producers may undermine market presence and viability
- Shifting consumer preferences and market trends could affect demand for local plant varieties and organic products, impacting revenue streams and market positioning
- Changes in national or EU regulations, including seed production and certification regulations, could require significant adjustments and increase administrative burdens and compliance costs
- Policy changes prioritising other sectors over agriculture or focusing on larger agricultural actors could limit support for initiatives
- Patent regulations and sanitary standards, particularly regarding organic agriculture, threaten overall activities and market access

Figure 16 SWOT analysis – cultivar testing networks

3.1.4 SWOT analysis – comparison of crop types

To better understand the similarities and differences between different crop types, the SWOT analysis, and later also a bird view analysis, was conducted based on the following categories:

(i.) Arable Crops
(ii.) Vegetable production

In comparing the SWOT analyses of **vegetable** and **arable** production, both share common strengths in collaboration with stakeholders and focus on research and development to enhance production efficiency. Both sectors benefit from external funding sources like EU grants and government subsidies.
However, the **vegetable sector** emphasises its diverse infrastructure (greenhouses, local varieties, etc.) and faces enormous challenges, such as high R&D costs and difficulty finding specialised growers. On the other hand, the sector is threatened by complex regulations and competition from large-scale enterprises.

In contrast, **arable** production focuses more on advanced evaluation techniques (cultivar evaluation, data analysis etc.), with fewer commercial activities, facing challenges in online sales. The sector looks to digital innovation (e.g. drones, streamlined communication) for future growth but faces threats from a limited market for organic products and increased competition for funding.

While both sectors share common external threats from climate change and bureaucratic complexities, vegetable production is more market-oriented. In contrast, arable production focuses on research capabilities and partnerships with industry leaders.

TECHNICAL ECONOMIC SOCIO REGULATORY

STRENGTH

- Diverse infrastructure with farms, greenhouses, germination tests, and fields
- Significant number of local varieties for sale
- Conducts trials and experiments to improve production techniques
- A portion of the annual earnings is allocated to reinvestment, primarily for R&D activities
- Participation in international events and exports to numerous countries increases earnings
- Collaboration with agricultural experts for research and development
- Emphasis on building and maintaining strong relationships with growers and market leaders
- Incorporating customer feedback
- Hosting open field days once or twice a year to stay in touch with customers and gather feedback
- Strict adherence to organic standards and promotion of organic cultivars
- In some cases, implementation of large-scale projects funded by local government grants

WEAKNESS

- In some cases, workers resist when it comes to the implementation of digital technologies
- Difficulty finding growers for small seed quantities
- Financial constraints limit expansion and hiring
- High R&D costs, low subsidies
- Reliance on subsidies, risk of unstable funding
- Limited financial resources for investment and growth
- Difficulties in finding employees in rural areas
- Shortage of highly qualified agricultural workers
- Complex seed production (labour-intensive, specific infrastructure and equipment, etc.)
- Uncertainty about future regulatory changes

OPPORTUNITY

- Investing in technology for efficiency (e.g., automated seed processing systems, digital traceability tools)
- Engaging in research and development with agricultural research institutions
- Enhancing sustainable farming practices through collaboration and knowledge exchange
- Leveraging EU funding for innovation and development
- Diversifying product offerings, including organic seeds and smaller package sizes
- Exploring export opportunities for local varieties
- Organisation open field days to connect with relevant stakeholders
- Raising consumer awareness about organic products and sustainable practices
- Participating in agricultural events and congresses for networking and knowledge exchange
- Strengthening regulations and enforcement to combat mislabeling of organic products

THREAT

- Impact of climate change on crop yields, pest management, and the need to readapt production processes
- High R&D costs of new varieties
- Economic uncertainty and fluctuations in grant funding threatening financial sustainability and operational continuity
- Competition from large-scale agricultural enterprises and commercial seed producers undermining market presence and viability
- Lack of subsidy schemes and the complexity of applying for agricultural subsidy programs, involving strict criteria and bureaucratic red tape
- Slow adoption of organic farming practices delaying the benefits associated with organic agriculture, such as improved soil health, reduced chemical inputs, and biodiversity conservation
- Bureaucratic requirements and paperwork for organic certification increasing costs and hindering market expansion
- Bureaucratic hurdles for subsidy programs
- The uncertainties regarding the policy environment threatening the development of new projects, especially in small, local agricultural markets

Figure 17 SWOT analysis – crop type: vegetable

CASE: ARABLE PRODUCTION

TECHNICAL | ECONOMIC | SOCIO | REGULATORY

STRENGTH

- unique and robust method for cultivar evaluation
- core team of researchers
- extensive data analysis
- funding from various sources including training stations funds, regional subsidies, foundation and European Union
- investing in research and development
- collaborating with well-organized seed sector
- collaboration with a well-established network of organic arable farmers, researchers and seed companies

WEAKNESS

- in some cases, small number of knowledgeable staff, therefore vulnerability to personnel shifts
- lack of structured approach to organisation and market presence
- non profitable business model can lead to financial instability and hinder long-term sustainability
- lack of online sales (e.g. webshop)
- reluctance to commercialise may limit market reach and revenue potential
- relying on public research grants - financial instability

OPPORTUNITY

- integrating digital tools (e.g. drones) to enhance the efficiency of cultivar evaluation
- incorporating digital tools and technologies could streamline communication
- partnership with industry leaders, seed companies and other stakeholders to diversify funding and expand research capabilities
- collaborating with research stations can enhance breeding efforts and improve the quality of varieties
- engaging in dialogue with government bodies to secure better funding and support
- streamlined bureaucratic processes can facilitate faster market entry, regulatory compliance and business operations

THREAT

- climate change can lead to lower yields, prevelence of pests and diseases
- limited market for organic products
- challenges in finding and retaining employees
- relying on short-term grants poses a risk to long-term project continuity
- increased competition for sustainable agriculture funding from other organisations
- rapid changes in consumer preferences, market demand my require adapting strategies and offerings
- policy changes prioritising other sectors over agriculture or focusing on larger agricultural actors
- patent regulations and sanitary standards threaten overall activities and market access

Figure 18 SWOT analysis – crop type: arable

3.2 Workshop with the stakeholders

Once the SWOT analysis had been conducted, a brainstorming workshop with relevant stakeholders was held on 11th July 2024, with 15 participants from different countries. All participants, except one, had previously participated in the SWOT interview process. The countries represented at the workshop included Croatia (4 participants), Spain (3), Poland (2), Italy (2), Greece (1), Germany (1), Portugal (1), and Romania (1). The attendees' diverse backgrounds and experiences enriched the discussions and contributed to a comprehensive exploration of challenges and opportunities in the organic seed sector.

In total, 4 SWOTs have been presented: company, medium-sized organisations, vegetable and cultivar testing. Each SWOTs was presented to attendees, followed by receiving feedback.

As part of the workshop's conclusion, participants were served a MentiMeter survey consisting of four essential questions.

When asked about their challenges in the organic seed sector, participants highlighted several key issues, including the market for organic seeds, adapting to new agricultural techniques, derogations on using certain seeds, distribution and sales challenges, and organic production application and quality.

Participants pointed to the international market as a beacon of hope when identifying potential **organic seed-sector opportunities**. The prospect of organic seeds becoming mandatory by 2037 and the potential for tailoring seeds to local market demands were also highlighted as key areas of opportunity, instilling a sense of optimism in the sector's potential.

When asked to identify the biggest challenge for the organic seed sector, most participants pointed to **technical challenges**. Economic challenges closely followed this perception, while regulatory and social challenges were considered less pressing. These insights provide a clear understanding of the current state of the organic seed sector.

In response to the final question, "Do you base your business on a **business plan** and/or business model?", most participants indicated that they do. This response underscores the growing recognition of the importance of structured planning in the sector.

This Mentimeter session provided valuable insights into the current perceptions of challenges and opportunities within the organic seed sector, helping to shape a clearer understanding of the agro-business landscape.

Discussion and key conclusion points

The SWOT spider diagram was developed based on detailed SWOT analyses to visually represent the organisation's strengths across various dimensions. Spider diagrams, also known as radar charts, are particularly valuable in strategic assessments because they offer an at-a-glance comparison of multiple factors on the same scale. By mapping out strengths and other attributes, stakeholders can quickly identify which areas are performing well and which may need improvement. This type of diagram is often used to track progress, guide decision-making, and highlight critical areas for strategic focus.

The **strengths** in the spider diagram highlight key areas where organisations excel. Internal financial funding is rated highly, indicating strong financial backing for operations and growth. High-quality seeds and a wide range of crops and varieties underscore organisations' abilities to produce diverse and reliable agricultural outputs. Additionally, partnerships with researchers and collaboration with farmers and breeders strongly emphasise innovation and stakeholder engagement. Organisations interviewed also benefit from a good business plan and investment in R&D, further reinforcing its strategic planning and development efforts.
However, despite these strengths, some areas like digitalisation and online sales are rated lower, signalling the potential for modernisation in these fields. Furthermore, organisations strengths lie in its financial stability, product quality, and collaborative efforts, positioning it well for future growth and innovation in the agricultural sector.

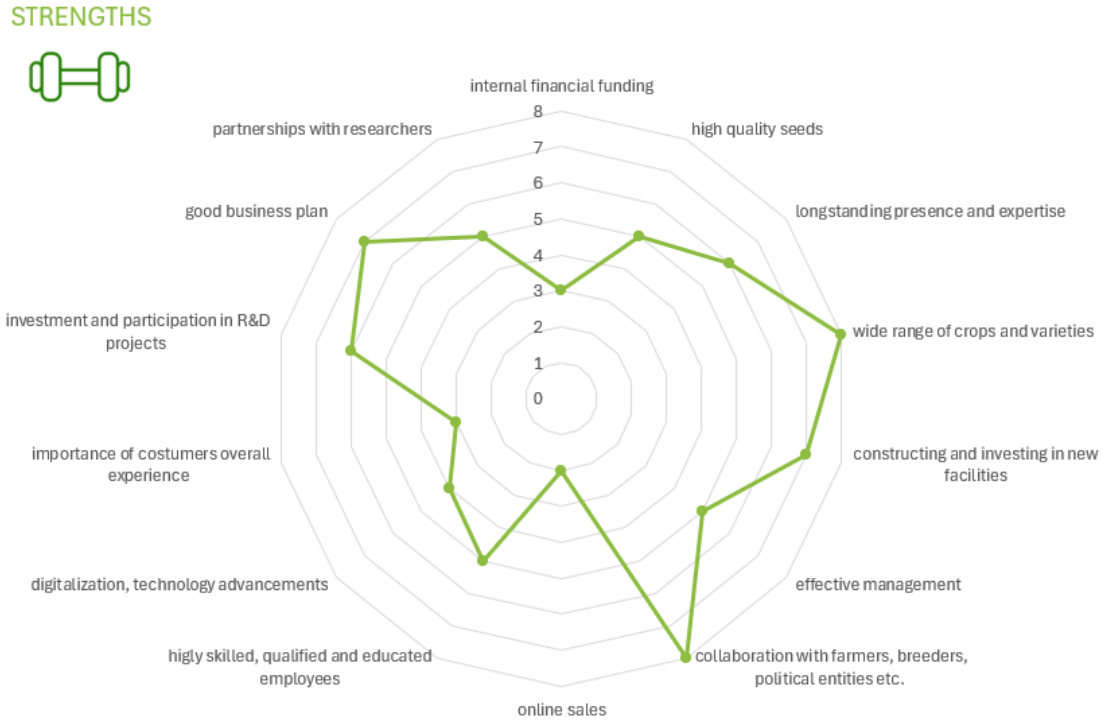


Diagram 1 SWOT analysis - spider diagram - strengths

The **weaknesses** illustrated in the spider diagram reflect several key challenges that organisations face. The shortage of a qualified workforce and difficulty finding experts stand out, indicating significant talent acquisition issues. Additionally, bureaucratic inefficiencies, including excessive paperwork and reliance on external funding and subsidies, hinder operations and financial stability.

Other operational weaknesses include high production costs and the lack of a strong marketing strategy, especially in online sales. The small market for organic varieties adds further complexity alongside competition from other companies. The lack of detailed communication strategies and complex regulatory requirements also affect the organisations abilities to expand efficiently. Overall, these weaknesses highlight areas for improvement in workforce development, marketing, and operational streamlining.

It is essential to indicate that some of the elements can be represented in multiple categories (e.g., online sales could be perceived as a strength or as a weakness). This is because, in some cases, this aspect has received more attention and has been developed structurally, while in other cases, it has been neglected or not a focal point of the organisation.

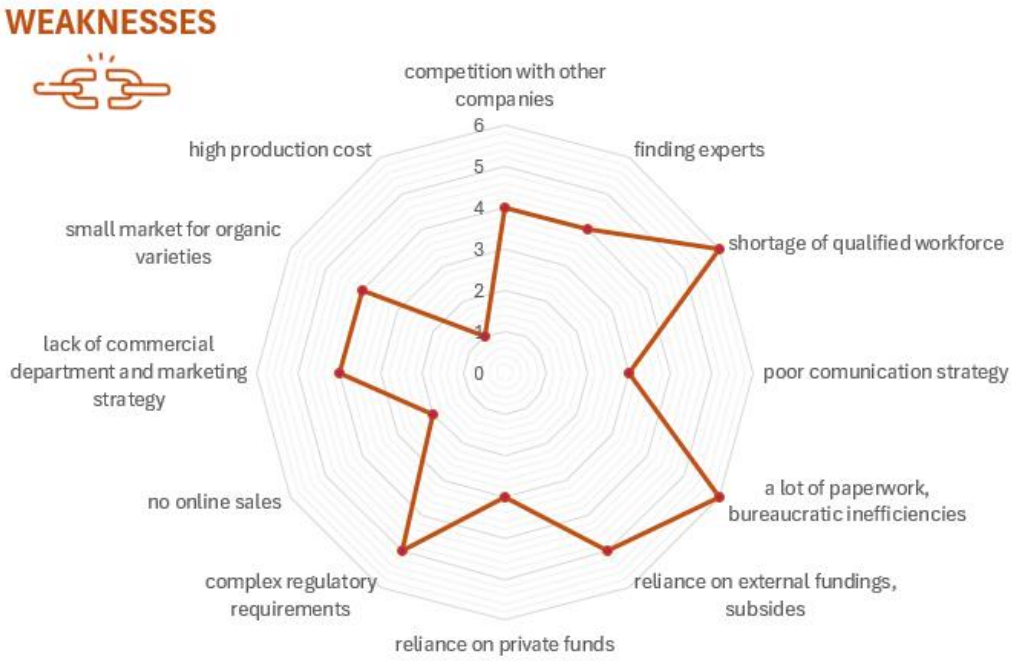


Diagram 2 SWOT analysis - spider diagram – weaknesses

The **opportunities** section of the spider diagram highlights several critical areas for potential growth. One of the most vital opportunities is collaboration with policymakers and stakeholders, which could enhance alignment with regulatory frameworks. Engaging with other businesses and research groups also holds significant promise for fostering innovation. Additionally, investments in IT, digitalisation, and innovation offer opportunities to modernise operations. The chance

to expand market reach through adaptation to market trends, increasing public awareness, and developing varieties tailored to climate change further enhance the organisations potentials. Lastly, active participation in research and development projects strengthens long-term competitiveness and sustainability.

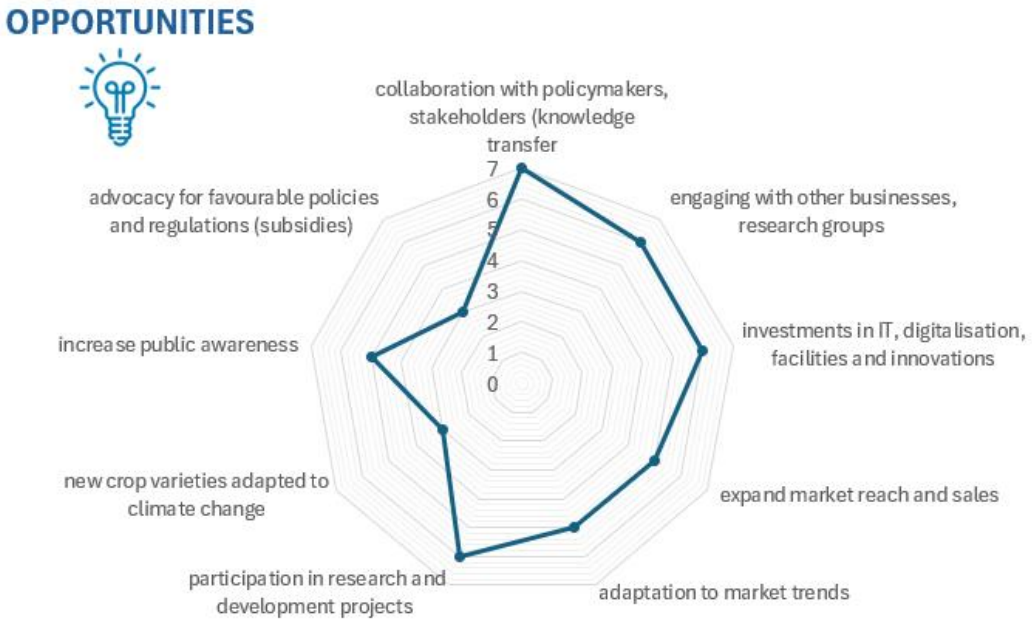


Diagram 3 SWOT analysis - spider diagram – opportunities

The spider diagram highlights several significant **threats** faced by these organisations. Fluctuations in market demand and high competition present considerable risks, while climate-related challenges such as natural disasters and disease outbreaks pose further threats to operations. The uncertainty of government support and inflation contribute to financial instability, and a shortage of skilled workforce further complicates matters. Additionally, reliance on short-term grants, lack of subsidy schemes, and high research costs are notable financial obstacles. Regulatory hurdles, the limited organic product market, and policy changes favouring other sectors exacerbate the challenges.

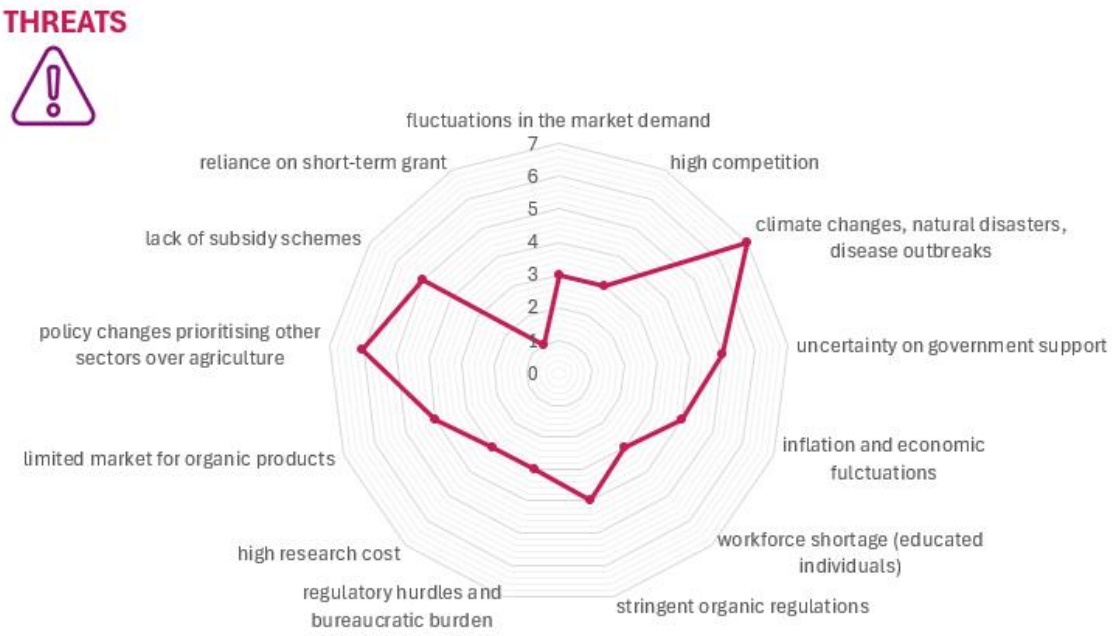


Diagram 4 SWOT analysis - spider diagram – threats

Figure 9 summarises all SWOT spider diagram statements, with the ones highlighted in colour indicating areas that received more responses than the others.

Figure 19 Overview of all SWOT SPIDER diagram statements

3.3 Survey on the European organic seed and breeding market

The survey was prepared and implemented using a Survey Sparrow app. Its main aim was to detect technical, economic, and regulatory challenges that organic seed producers face today and analyse market opportunities that new organic trends are imposing for the upcoming years.

The survey has been prepared in English and translated into ten consortium languages (English, Polish, German, Romanian, Greek, French, Italian, Croatian, Spanish, and Slovenian). The survey consisted of 51 questions, divided into three main parts: (i) general profiling, (ii) the EU organic seed and breeding market and (iii) analysis of economic, technical, regulatory and encouragement segments of organic seed production.

The survey aimed at two key stakeholder groups: (i) Organic seed producers/traders or breeders that produce and/or trade seeds and (ii) Conventional seed producers/traders or breeders that plan to produce/trade organic seeds/cultivars.

The survey was widely distributed among European stakeholders using different communication channels and received 140 responses. Most of the responses came from the central EU and Switzerland (56), followed by the Southern EU (48) and Eastern EU (29). The lowest number of responses was received from the Northern EU (7). The biggest responses came from Germany (21) and Spain (21).

At the same time, the survey received only a few responses from Belgium (2), Portugal (2), and Slovenia (3) and from some countries outside the project consortium - Sweden (3), Austria (3), Finland (2), Latvia (2), Luxembourg (2), Bulgaria (1), and Serbia (1). Therefore, the current state of those countries' organic seed and plant breeding sector cannot be considered representative.

The figure below provides an overview of the regions' categorisation and responses collected per country.

Figure 20 Regions covered by the LiveSeeding survey

Germany and Spain contributed with the most significant responses (21 each). In contrast, minimal responses were received from Belgium (2), Portugal (2), Slovenia (3), and non-consortium countries such as Sweden (3), Austria (3), Finland (2), Latvia (2), Luxembourg (2), Bulgaria (1), and Serbia (1). Due to the limited responses from these countries, the data cannot be considered representative of the current state of the organic seed and plant breeding sectors in those regions. Additionally, no responses were received from the UK.

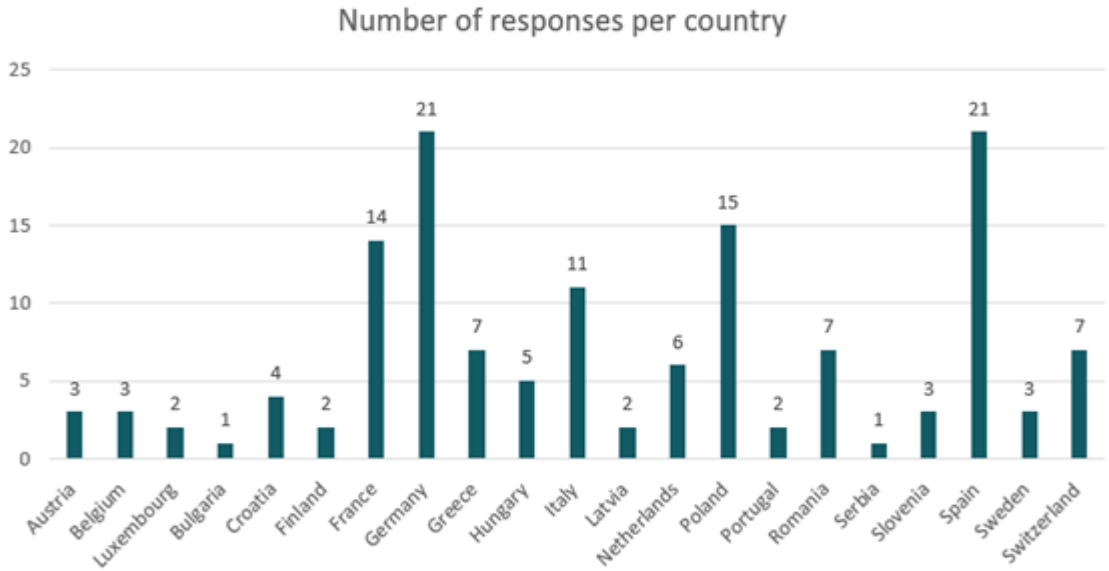


Figure 21 Number of survey responses per country

According to the survey data, commercial companies were the most represented type of organisation across all EU regions. Their share varied depending on the area, but on average, they accounted for between 40% and 60% of all organisations. Agricultural cooperatives were the second most common type represented in the survey, making up between 20% and 30%. They were most prominent in Central and Southern Europe. Family farms are the least represented in the survey responses, with a share ranging from 10% to 20%, mostly coming from Eastern and Southern Europe.

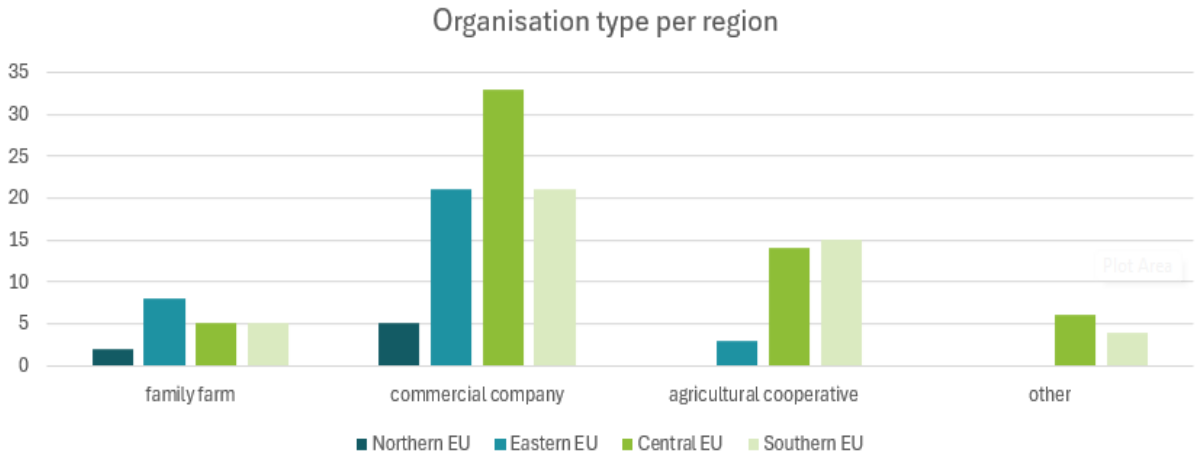


Figure 22 Organisation type per region

3.3.1 GENERAL PROFILES

The survey was conducted with participants from 21 countries, totalling 140 respondents. Among them, 72,1% (101) were men, 27,1% (38) were women, and 0.7% (1) individuals identified as "other." In many countries, men are the predominant respondents, especially in Greece and Italy, where there are almost no female participants in the survey. In contrast, Poland has more equal representation of both genders.

Regarding education, 23 respondents have completed high school, 22 hold a Bachelor's (BSc) degree, 82 have a Master's (MSc) degree, and 13 identified as "other", showing that most respondents have a high level of academic achievement.

The youngest age group (20-30) had the fewest respondents. There were 33 respondents aged 31-40, with the largest group being those aged 41-50. A considerable number of respondents, 29, were in the 51-60 age range, while 27 were over 60. This overview might also reveal a concerning trend of only a small number of younger people being involved in agriculture.

	Age		Gender		Education	
Northern EU	20-30	0%	M	86%	High school level	14%
	31-40	0%	F	14%	college level (BSc)	29%
	41-50	14%	Other	0%	college level (MSc)	57%
	51-60	14%			Other	0%
	>60	71%				
Eastern EU	20-30	3%	M	55%	High school level	9%
	31-40	30%	F	42%	college level (BSc)	15%
	41-50	27%	Other	0%	college level (MSc)	64%
	51-60	21%			Other	9%
	>60	15%				
Central EU	20-30	13%	M	79%	High school level	20%
	31-40	29%	F	21%	college level (BSc)	20%
	41-50	29%	Other	0%	college level (MSc)	48%
	51-60	14%			Other	13%
	>60	16%				
Southern EU	20-30	11%	M	73%	High school level	18%
	31-40	16%	F	24%	college level (BSc)	9%
	41-50	27%	Other	2%	college level (MSc)	67%
	51-60	29%			Other	7%
	>60	18%				

Table 3 Overview of general profiling of respondents by age, gender and education level

Based on the **registration type** (as indicated in Figure 14), respondents from all regions generally indicated that the highest percentage type was a commercial company, with 58,6%, although there were some exceptions. For instance, in the Central region, French respondents predominantly reported that family farms and "other" types were the most common, accounting for 78.6%. In the Eastern region, only respondents from Romania indicated that the number of family farms was double that of commercial companies, with a ratio of 57.1%. In the Southern region, respondents from Spain stood out, reporting that the most registration types were agricultural cooperatives and "other," with a percentage of 66.7%.

Regarding **business experience**, 95.7% of respondents indicated that their company's activity lasted more than 15 years. The only exceptions were respondents from Croatia and Portugal, where 66.7% of participants declared that their company's activity spans between 6 and 10 years.

Regarding **crop types produced/traded** by participants, arable crops, such as wheat, maize, and potatoes, dominate agricultural activities across most regions, particularly in Germany, Northern Europe, Poland, and Greece, where over 70% of respondents

reported involvement in production and trading. Italy and Eastern Europe also show strong production figures, reaching 100% for arable crops. The production and trading of oil plants (sunflower and rape seed) are the highest in Northern and Central Europe. Grain legumes, including soybeans and peas, are more commonly produced in Germany, Italy, Poland, and Northern Europe, with over 50% involvement. Forage grasses, such as clover and alfalfa, are important in Germany, Italy, and Northern Europe, where production exceeds 60%. Vegetable production is significant in Spain and Italy, where more than 60% of respondents are engaged in growing crops like tomatoes and lettuce.

		Arable crops (wheat, oat, barley, maize, potatoes)	Oil plants (rape, seed, sunflower…)	Grain legumes/Pulses (lupine, pea, fiels, bean, soybean…)	Forage/Grasses (clover, alfaalfa, grass-clover mixtures, green manure..)	Vegetables (tomato, brassica, lettuce, carrots, onion…)	Fruits (apple, grape, strawberries, olives…)	Other crops
GERMANY	PRODUCING	81%	33%	71%	38%	19%	0%	29%
	TRADING	81%	52%	76%	43%	29%	0%	29%
FRANCE	PRODUCING	62%	15%	54%	31%	38%	0%	38%
	TRADING	69%	23%	54%	31%	46%	0%	46%
SPAIN	PRODUCING	43%	14%	43%	14%	71%	14%	19%
	TRADING	38%	19%	48%	19%	57%	14%	24%
ITALY	PRODUCING	100%	27%	36%	64%	18%	9%	9%
	TRADING	91%	55%	64%	73%	27%	9%	18%
POLAND	PRODUCING	73%	13%	53%	67%	13%	0%	20%
	TRADING	80%	13%	60%	73%	13%	0%	13%
GREECE	PRODUCING	71%	0%	71%	71%	57%	0%	0%
	TRADING	100%	14%	86%	100%	57%	0%	43%
ROMANIA	PRODUCING	29%	43%	71%	14%	0%	0%	0%
	TRADING	29%	43%	71%	14%	0%	0%	0%
CENTRAL EUROPE (AT, CH, BE, NL, LX)	PRODUCING	32%	32%	45%	41%	68%	18%	36%
	TRADING	41%	23%	32%	27%	59%	23%	32%
NORTHERN EUROPE (SW, FI, LT)	PRODUCING	100%	57%	57%	71%	0%	0%	0%
	TRADING	86%	43%	43%	71%	0%	0%	0%
SOUTHERN EUROPE (CT, PT)	PRODUCING	33%	0%	67%	0%	67%	0%	17%
	TRADING	50%	33%	67%	33%	67%	0%	0%
EASTERN EUROPE (BG, RS, SLO, HU)	PRODUCING	80%	20%	40%	30%	60%	0%	10%
	TRADING	80%	60%	50%	50%	50%	0%	10%

Table 4 Overview of crops produced/traded by survey participants

The information regarding the **provision of data in national organic seed databases** significantly differs from the previously mentioned interest in production and trading. 33% of countries reported 0% engagement, while only Latvia, Sweden, and the Netherlands reported 100%. However, it is essential to note that responses from Latvia and Sweden were limited in number. Furthermore, one could conclude that 71.4% of countries indicated 0% engagement in listing seed offers in the EU-wide Router seed database developed by LIVESEED. Only the Netherlands (100%), Germany (81%), and Switzerland reported active engagement, reaching 50 % of the total responses from these countries.

Interest in organic seed production is slightly higher than in organic seed trading. Northern European countries have shown 100% interest in production, followed by Central European countries with 75-100% interest. In Southern and Eastern Europe, the interest levels for production are balanced.

The **activity in organic seed trading** is highest in Sweden, Bulgaria, Serbia, Luxembourg, Croatia, and Greece, where it reaches 100%. In other countries, the

interest ranges between 33% and 81%. The lowest interest levels were reported in Slovenia (33%), Poland (40%), Finland, Latvia, Switzerland, and Portugal, where interest stands at 50%.

Many countries across Europe, with more than 50% of respondents, believe that **organic seeds are more expensive** than conventional ones. Slovenia is the only country below 50%, but it's important to note that only three responses are gathered in Slovenia.

In some countries, such as Latvia, Bulgaria, Greece, and Portugal, respondents unanimously reported that it is **challenging to find organic seed producers**, with a 100% difficulty rate. On the other hand, countries like Serbia and Luxembourg reported no such difficulty (0%), followed by France, Germany, Belgium, and Spain, where the reported difficulty ranges from 15% to 43%.

Region of seed sale	Country	Interested in producing of organic seeds	Interested in trading of organic seeds	Providing in national organic seed database	Listing seeds offer in the EU wider Router seed database developed by LIVESEED	Organic seed more expensive than conventional	Problems with finding organic seed producers
Northern EU	Finland	100%	50%	0%	0%	100%	50%
	Latvia	100%	50%	100%	0%	100%	100%
	Sweeden	100%	100%	100%	33%	67%	67%
Eastern EU	Bulgaria	100%	100%	0%	0%	100%	100%
	Poland	67%	40%	33%	7%	80%	60%
	Romania	71%	57%	0%	0%	57%	57%
	Hungary	100%	80%	40%	0%	80%	80%
	Slovenia	67%	33%	0%	0%	33%	67%
	Serbia	100%	100%	0%	0%	100%	0%
Central EU	Austria	100%	67%	67%	0%	100%	67%
	France	115%	69%	54%	0%	85%	15%
	Germany	90%	81%	86%	81%	71%	29%
	Belgium	100%	67%	0%	0%	100%	33%
	Luxembur	100%	100%	0%	0%	50%	0%
	Netherlan	100%	83%	100%	100%	100%	67%
	Switzerlar	75%	50%	63%	50%	50%	38%
Southern EU	Croatia	75%	100%	50%	0%	100%	50%
	Greece	86%	100%	14%	0%	100%	100%
	Italy	100%	64%	45%	0%	82%	64%
	Portugal	100%	50%	50%	0%	50%	100%
	Spain	81%	71%	5%	5%	71%	43%

Table 5 Interest of respondents to produce/trade organic seed and LIVESEED database presence

3.3.2 ECONOMIC CHALLENGES

As indicated above, most respondents know that organic seeds are more expensive. Therefore, one of the survey questions focused on the **funds used to cover the additional costs** of organic seed production.

The most significant source, by far, is the higher price for organic seed, with 98 respondents indicating this as the primary method for covering extra costs. Government subsidies and cooperation with other actors in the value chain are also notable, with 28 to 31 respondents using these sources. This highlights the importance of financial support from government programs and collaboration within the agricultural supply chain. Research funding and cooperation with other seed producers are moderately relied upon, each being used by 27 respondents.

Less frequently used sources include funds from private sources (12 respondents), foundation funds (10 respondents), and royalties (9 respondents), which shows that these options are less common. Additionally, 11 respondents mentioned other funding sources, and only 7 stated that organic seed production does not cause any additional costs.

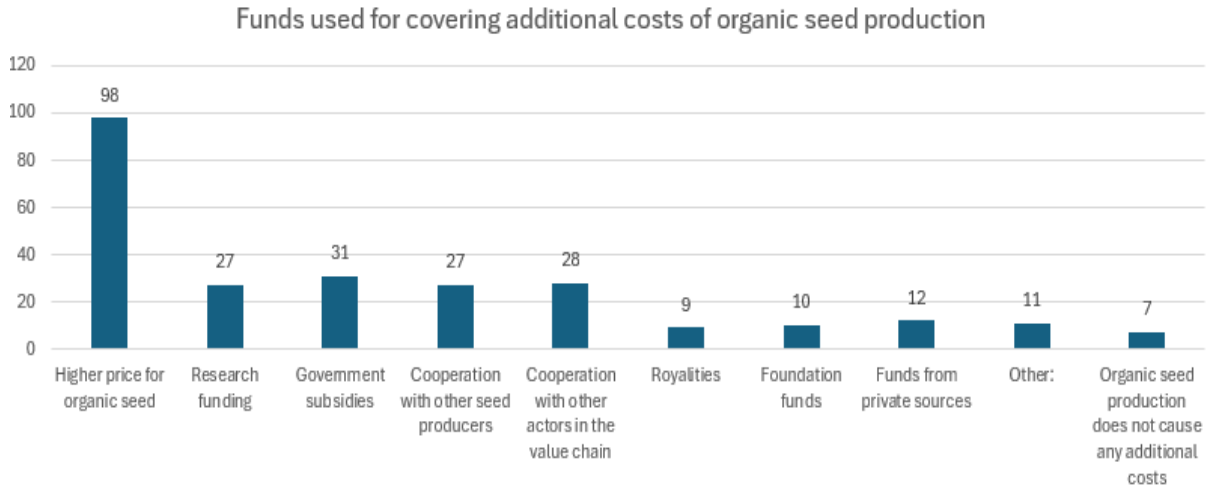


Figure 23 Respondents funds used for covering additional costs

The "**Top 3 countries in which organic seeds are sold**" table highlights the primary markets where organic seeds from these regions are sold.

In Northern Europe, the key destinations for organic seeds are Sweden, Finland, and Germany. This suggests a regional focus, with Northern European countries trading predominantly among themselves, while Germany also plays a significant role as an importer from this region.

In Central Europe, the primary markets for organic seed sales are Germany, France, Belgium, and Switzerland. Germany stands out as a dominant buyer, showing its central role in the trade network.

In Southern Europe, the top destinations for organic seeds are Germany, France, Austria, and Denmark.

Overall, Germany is the most prominent buyer of organic seeds across all regions, indicating its central role as the EU's largest market for organic seeds. France also consistently appears as a key market.

LiveSeeding	Countries from which organic seeds are selling	TOP 3 countries in which organic seeds are sold
Northern EU	Finland	Finland, Sweden
	Latvia	Latvia, Estonia, Lithuania
	Sweden	Sweden, Finland, Germany
Eastern EU	Bulgaria	Bulgaria
	Poland	Poland, Germany, Czech Republic
	Romania	Romania, Republic of Moldova
	Hungary	Hungary, Austria, France
	Slovenia	Slovenia, Croatia, Germany
	Serbia	/
Central EU	Austria	Austria, Germany, Switzerland
	France	France, Belgium, Switzerland
	Germany	Germany, France, Denmark,
	Belgium	Belgium, France, Luxembourg
	Luxembourg	Luxembourg
	Netherlands	Netherlands, Germany, France
	Switzerland	Switzerland, France, Germany
Southern EU	Croatia	Croatia, Austria, Denmark
	Greece	Greece, Denmark, Spain
	Italy	Italy, France, Germany
	Portugal	Portugal, Germany, Switzerland
	Spain	Spain, France, Germany

Table 6 Top 3 countries in which organic seeds are sold

The most pressing **economic challenges** across the EU for organic seed production are related to operational and capital expenditure, followed by the cost of certification and low return on investment for breeding programs. Legal and educational challenges are important but rank lower than financial and operational burdens.

3.3.3 TECHNICAL CHALLENGES

The survey asked respondents what sources they use to **obtain information on organic seed production**. The most used source is websites, with around 50% of respondents indicating that they rely on online resources for general information about organic seeds. Around 30% of respondents obtain information from national advisory bodies, such as extension services, which provide official, expert guidance tailored to regional needs. Similarly, about 30% also use agricultural consulting services, emphasising the role of specialised consulting in offering targeted advice and expertise.

On the other hand, approximately 20% of respondents use agricultural trade shops, showing that local shops still serve as relevant sources for some producers. While valued for hands-on learning, workshops are also used by around 20% of respondents, making them a less frequent source compared to online or professional advisory options. Lastly, about 20% of respondents rely on other sources for information, suggesting that various informal or niche channels, such as peer networks or industry events, contribute to the knowledge base of organic seed producers.

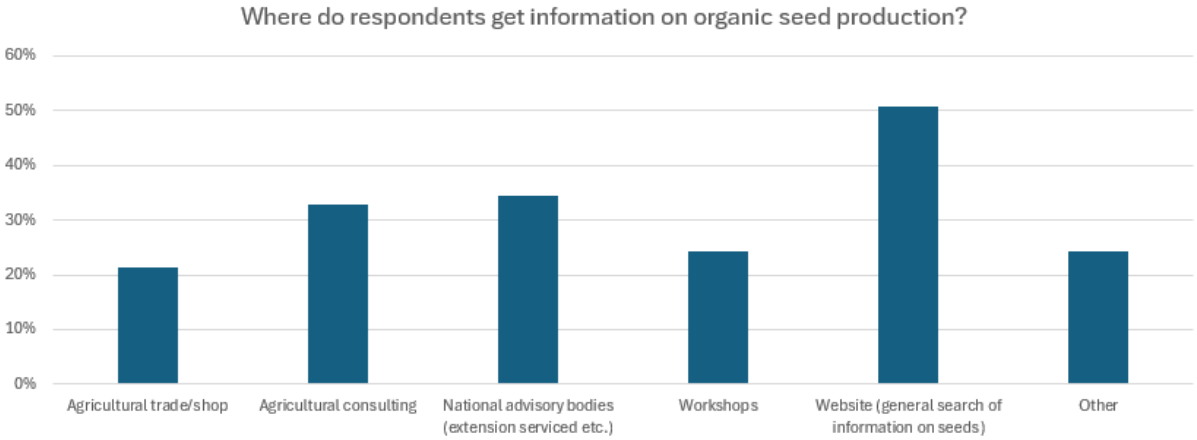


Figure 24 Sources to obtain information

The main **technical challenges** in organic seed production across all regions are weed presence, seed-borne pests and diseases, and yield losses or volatility.

Weed contamination is the most common issue, especially in Central and Eastern Europe. Seed-borne pests and diseases are a significant challenge, particularly in Central and Southern Europe. Last but not least, yield losses and volatility are also widespread. Organic farming is more sensitive to environmental factors, leading to unpredictable yields. These challenges highlight the need for ongoing innovation to improve organic seed production.

Organic seed production is ECONOMICALLY challenging in terms of ...	Northern EU Fin., Lat., Swdn.					Eastern EU Bulg., Pol., Rom., Hun., Slo., Srb.					Central EU Aus., Fra., Ger., Bel., Lux., Neth., Switz.,					Southern EU Cro., Gre., Ita., Por., Spa				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Operational expenditure (OPEX, e.g. labour, etc)	14%	14%	57%	14%	0%	0%	3%	36%	15%	42%	7%	7%	14%	34%	25%	7%	11%	27%	20%	22%
capital expenditure (CAPEX, e.g. organic certified cleaning/packaging facilities, seed processing infrastructure)	0%	14%	14%	43%	29%	0%	9%	42%	15%	30%	13%	5%	20%	36%	14%	9%	11%	22%	29%	13%
cost of certification	29%	43%	29%	0%	0%	6%	12%	36%	18%	24%	18%	18%	27%	16%	9%	11%	11%	22%	22%	18%
marketing cost	14%	14%	29%	43%	0%	3%	6%	52%	21%	15%	13%	27%	34%	13%	0%	11%	9%	24%	20%	22%
low return on investment of dedicated organic breeding programs	0%	14%	14%	14%	57%	3%	9%	30%	18%	0%	14%	11%	20%	18%	21%	11%	7%	24%	31%	13%
education that is needed on financing models	0%	29%	14%	43%	14%	6%	9%	30%	30%	21%	16%	20%	36%	11%	4%	9%	13%	22%	24%	11%
frequent changes of legal framework	0%	43%	14%	0%	43%	0%	15%	33%	18%	30%	9%	16%	30%	21%	7%	13%	11%	9%	40%	9%
Difficulties to fulfil the ilegal requirements	0%	43%	43%	14%	0%	0%	12%	36%	21%	27%	4%	18%	23%	29%	14%	7%	2%	18%	31%	29%
discrepancies between national and EU legal framework	71%	29%	0%	0%	0%	3%	15%	33%	21%	21%	9%	11%	23%	25%	18%	9%	4%	16%	27%	33%

Organic seed production is TECHNICALLY challenging in terms of ...	Northern EU Fin., Lat., Swdn.					Eastern EU Bulg., Pol., Rom., Hun., Slo., Srb.					Central EU Aus., Fra., Ger., Bel., Lux., Neth., Switz.,					Southern EU Cro., Gre., Ita., Por., Spa				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
yield losses/volatility	0%	14%	14%	43%	29%	0%	3%	18%	24%	55%	2%	2%	14%	34%	41%	9%	9%	16%	29%	36%
hybrid propagation	29%	43%	29%	0%	0%	9%	3%	36%	9%	39%	18%	7%	30%	16%	20%	16%	18%	20%	18%	24%
storage and treatment	14%	14%	29%	43%	0%	3%	12%	24%	21%	39%	9%	18%	21%	27%	18%	13%	4%	11%	47%	16%
seed-borne pests and diseases	0%	14%	14%	14%	57%	0%	6%	6%	36%	52%	2%	11%	16%	27%	38%	18%	4%	9%	24%	40%
weed contamination	0%	29%	14%	43%	14%	0%	3%	9%	18%	70%	4%	9%	20%	25%	34%	11%	11%	13%	20%	40%
finding enough farmers willing to multiply the seed	0%	43%	14%	0%	43%	0%	3%	15%	21%	70%	13%	20%	27%	20%	14%	7%	9%	22%	18%	38%
germination rate and seed size	0%	43%	43%	14%	0%	9%	24%	24%	18%	24%	16%	14%	23%	11%	5%	27%	13%	24%	18%	9%
contamination with GMO	71%	29%	0%	0%	0%	36%	18%	15%	12%	18%	29%	14%	18%	9%	5%	31%	9%	18%	18%	16%

Table 7 Overview of economic and technical challenges

3.3.4 LEGAL AND POLITICAL CHALLENGES

When analysing the regulatory challenges for the organic seed sector, the following responses are obtained on the level of all answers collected:

Providing more information on organic seed markets

This consistently ranks as one of the most important across Europe, indicating a strong need for better market transparency and access to information regarding organic seeds.

Providing a large extensive range of organically allowed seed treatments

Another key area of focus is expanding the range of organic seed treatments permitted under organic standards. Many respondents consider this a necessary step to improve seed quality and health while adhering to organic regulations. In this regard, it is essential to research organic seed treatments that can provide solutions. The LiveSeeding project is working on several techniques, such as the use of heat.

Establishing interaction between policymakers and organic seed producers

Throughout Europe, there is a clear call for better communication and collaboration between government bodies and organic seed producers. Strengthening this relationship is critical for ensuring that regulations are practical, supportive, and aligned with the needs of producers.

Phasing out derogations for conventional seed

The phasing out of derogations that allow the use of conventional seeds in organic farming is an essential step toward promoting organic seed production.

Conducting more research on the profitability of organic seed production

Understanding profitability is essential for encouraging investment in organic seeds and ensuring producers can access the necessary financial resources.

In summary, the three main regulatory improvements supporting organic seed production across Europe are increasing market transparency and information on organic seed markets, expanding the range of organically allowed seed treatments, and fostering better communication between policymakers and producers.

The three most dominant **ways to support the development of organic seed production** across Europe are providing subsidies related to capital expenditure, which is crucial for infrastructure investments, simplification of the administrative burden (such as certification processes and variety registration), and support for organic breeding and seed production research projects, which highlights the need for innovation and continued research in the organic seed sector.

REGULATORY segments that can support better development of organic seed production include...	Northern EU Fin., Lat., Swdn.					Eastern EU Bulg., Pol., Rom., Hun., Slo., Srb.					Central EU Aus., Fra., Ger., Bel., Lux., Neth., Switz.,					Southern EU Cro., Gre., Ita., Por., Spa				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
phasing out the derogations for conventional seed	0%	14%	43%	29%	14%	27%	6%	24%	12%	27%	7%	7%	18%	23%	38%	16%	7%	31%	16%	27%
implementing stricter national standards in allowing derogation for conventional seed in the next 5 years	0%	29%	29%	43%	0%	9%	3%	33%	21%	30%	11%	9%	25%	23%	25%	18%	7%	24%	22%	24%
providing a larger range of organically allowed seed treatments	14%	0%	29%	57%	0%	6%	12%	30%	21%	27%	16%	11%	29%	23%	14%	7%	4%	18%	24%	44%
introducing (e.g. governmental) subsidies to support organic seed producion	0%	29%	14%	43%	14%	0%	9%	18%	24%	45%	13%	9%	18%	21%	29%	11%	7%	11%	31%	33%
establishing interaction between policymakers and organic seed producers	0%	14%	57%	29%	0%	0%	3%	27%	27%	39%	9%	5%	29%	23%	29%	7%	4%	18%	36%	27%
Providing information on organic seed market demand of EU and non-EU markers	0%	29%	57%	0%	14%	0%	3%	24%	30%	36%	9%	9%	30%	27%	16%	4%	4%	27%	16%	38%
providing training offers on organic seed production	0%	0%	86%	0%	14%	0%	3%	24%	33%	33%	9%	14%	29%	23%	20%	9%	4%	22%	24%	31%
Conduction more research on profitability of organic seed production	0%	14%	29%	29%	29%	0%	6%	18%	30%	39%	9%	20%	27%	23%	16%	7%	9%	16%	27%	29%
Generate a less demanding legal framework for SME (e.g. in infrastructure)	0%	14%	43%	29%	14%	0%	3%	24%	30%	33%	11%	14%	34%	14%	16%	7%	9%	16%	9%	42%
Generate a less demanding legal framework for Organic heterogeneous material, Organic varieties, local traditional cultivars and cultivars coming from participatory and farmers' plant breeding	0%	0%	29%	29%	43%	3%	6%	24%	24%	36%	23%	7%	16%	21%	23%	9%	9%	20%	16%	36%

Development of the organic seed production should be SUPPORTED via....	Northern EU Fin., Lat., Swdn.					Eastern EU Bulg., Pol., Rom., Hun., Slo., Srb.					Central EU Aus., Fra., Ger., Bel., Lux., Neth., Switz.,					Southern EU Cro., Gre., Ita., Por., Spa				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
subsidies related to operational expendature	14%	14%	57%	0%	14%	6%	6%	18%	30%	36%	20%	9%	23%	21%	18%	9%	4%	18%	16%	47%
subsidies related to capital expenditure	0%	14%	71%	0%	14%	3%	0%	24%	30%	39%	16%	7%	20%	30%	18%	16%	4%	20%	24%	24%
support with the development of marketing strategies	14%	0%	57%	0%	29%	0%	6%	36%	15%	48%	20%	13%	38%	11%	11%	11%	9%	11%	33%	27%
simplifiation of the administration burden (e.g. certification process, variety registration process)	0%	29%	29%	14%	29%	3%	6%	27%	21%	39%	11%	5%	14%	29%	36%	9%	0%	16%	13%	53%
support with the setup of seed producers' associations	14%	14%	43%	0%	29%	3%	6%	27%	27%	33%	25%	18%	11%	21%	13%	11%	0%	22%	27%	29%
education and training on organic seed production	0%	29%	29%	29%	14%	0%	3%	12%	27%	58%	11%	7%	23%	21%	29%	7%	4%	20%	20%	38%
organic breeding and seed production research projects	0%	14%	29%	14%	43%	0%	3%	15%	27%	52%	7%	16%	9%	23%	38%	13%	2%	13%	24%	36%
invitation of experts/stakeholders to participate in government initiated organic seed working groups	0%	29%	43%	0%	29%	3%	6%	21%	21%	42%	9%	14%	21%	27%	20%	9%	9%	20%	29%	20%
developing national roadmap for 100% organic seed including national lists of crops without derogation	0%	43%	43%	0%	14%	0%	3%	24%	24%	42%	11%	4%	21%	14%	21%	11%	2%	27%	18%	24%
timely update of national organic seed database and connection to EU wide Router database	0%	29%	29%	14%	29%	0%	0%	24%	27%	42%	5%	9%	18%	36%	21%	11%	2%	22%	31%	18%
organisation of field demo days to showcase good practices	0%	14%	43%	14%	29%	0%	6%	24%	18%	45%	13%	7%	30%	18%	21%	9%	0%	18%	29%	29%
include other levels of governance (e.g. municipal, regional) generate a national strateg to enhance the use of organic seeds with specific funds	14%	29%	14%	29%	14%	0%	9%	30%	27%	27%	20%	21%	20%	16%	11%	11%	7%	24%	24%	18%
Raising awareness campaigns about the importance of organic seeds	0%	14%	43%	29%	14%	0%	6%	36%	15%	33%	14%	9%	16%	25%	27%	9%	4%	9%	33%	29%

Table 8 Overview or regulatory challenges and type of support needed

3.3.5 ENCOURAGEMENT ACTIONS

Based on the data collected via the survey and across all European regions, the respondents indicate the following five areas as the most dominant and necessary for **improving the competitiveness** of the organic sector through the development of new cultivars are:

1. Organic plant breeding under certified organic conditions
   This is consistently prioritised across Europe, highlighting the need for breeding directly under organic conditions to ensure cultivars are well-suited for organic farming systems.
2. Breeding for organic, considering specific breeding goals
   There is strong support for breeding programs that focus specifically on the needs and challenges of organic agriculture, tailoring traits to organic production systems.
3. Breeding for diversity (e.g., OHM, Mixed cropping)
   This approach emphasises the importance of increasing genetic diversity and resilience through breeding for organic heterogeneous materials.
4. Conventional breeding followed by organic cultivar testing
   While organic breeding is preferred, there is still significant recognition of the role of traditional breeding methods, followed by testing cultivars in organic conditions to develop suitable varieties.
5. Decentralised participatory plant breeding for local adaptation
   This method is seen as important for creating locally adapted cultivars that can thrive in specific regional conditions.

To improve the competitiveness of the organic sector it is necessary to develop NEW CULTIVARS through...	Northern EU Fin., Lat., Swdn.								Eastern EU Bulg., Pol., Rom., Hun., Slo., Srb.								Central EU Aus., Fra., Ger., Bel., Lux., Neth., Switz.,								Southern EU Cro., Gre., Ita., Por., Spa							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
organic plant breeding under certified organic conditions	57%	14%	29%	14%	0%	0%	0%	0%	52%	21%	9%	12%	3%	0%	3%	0%	29%	10%	7%	7%	7%	3%	3%	3%	40%	4%	13%	13%	9%	2%	7%	9%
breeding for organic considering specific breeding goals	29%	57%	0%	14%	14%	0%	0%	0%	12%	45%	30%	3%	6%	3%	0%	0%	12%	28%	24%	2%	2%	5%	2%	5%	18%	38%	13%	9%	9%	7%	2%	2%
Breeding for diversity (Orgaic Heterogeneous Material, Mixed cropping, etc.)	0%	43%	57%	0%	0%	0%	14%	0%	15%	12%	36%	15%	9%	3%	3%	6%	3%	7%	19%	17%	0%	16%	7%	5%	4%	22%	33%	9%	4%	11%	7%	7%
Conventional breeding followed by organic cultivar testing	14%	0%	0%	57%	29%	14%	0%	0%	15%	15%	3%	45%	9%	3%	6%	0%	7%	7%	10%	16%	16%	16%	2%	0%	4%	11%	11%	38%	27%	7%	0%	0%
Conventional breeding and conventional cultivar testing	0%	0%	14%	0%	43%	29%	14%	14%	0%	6%	9%	9%	48%	15%	6%	6%	3%	5%	2%	10%	21%	16%	10%	3%	11%	2%	4%	7%	36%	20%	16%	2%
Decentralized participatory plant breeding for local adaptation	14%	0%	14%	14%	14%	43%	0%	14%	3%	0%	6%	6%	18%	55%	6%	3%	5%	7%	5%	10%	7%	14%	12%	10%	11%	4%	9%	16%	7%	38%	2%	11%
Marker assisted selection	0%	0%	0%	14%	14%	29%	57%	0%	0%	0%	3%	9%	6%	15%	64%	3%	3%	5%	10%	3%	14%	3%	33%	0%	2%	7%	9%	2%	7%	11%	60%	0%
Genome editing	0%	0%	0%	0%	0%	0%	29%	86%	0%	0%	0%	0%	0%	6%	9%	82%	7%	2%	3%	7%	5%	0%	3%	45%	7%	9%	4%	4%	0%	2%	4%	67%

Table 9 Development of new cultivars – types of activities

3.3.6 TRAINING

Considering that the LiveSeeding project also focuses on knowledge exchange and training sessions, the survey also asked participants about the segments in which they would like to obtain more knowledge.

The most frequently mentioned aspect was **policy and regulation**, with 61 respondents indicating the need to better understand the regulatory environment. This suggests that navigating and complying with complex regulations is a top priority for stakeholders in the sector. **Marketing** is the second most crucial aspect, noted by 49 respondents. This reflects the need to enhance marketing strategies to expand the reach and profitability of organic seed production. Closely related, **entrepreneurship, business plans, and models**, was cited by 48 respondents, indicating a strong interest in improving business skills and creating sustainable business models in the organic sector. Additionally, **financing and investment management** is recognised as a key area for improvement by 44 respondents, underscoring the need for better financial planning and investment strategies. Lastly, **organisation models and governance**, mentioned by 29 respondents, shows that effective organizational structures and governance are also considered important, although they rank lower than other areas.

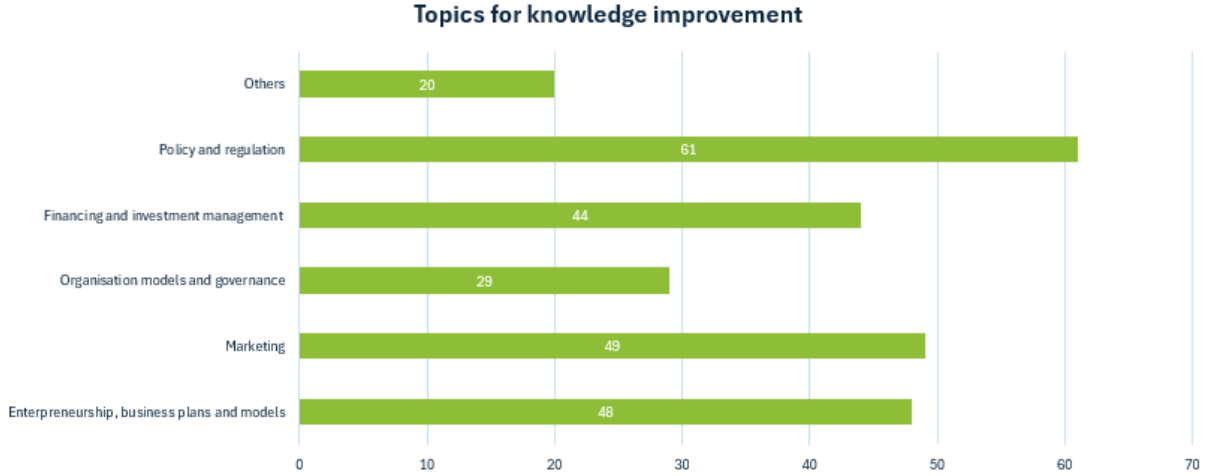


Figure 25 Topics for knowledge improvement – level of Europe

Figure 26 Topics for knowledge improvement – per country

3.4 Workshop "Market opportunities and technical challenges for organic seed producers"

In February 2023, relevant stakeholders participated in an online workshop titled "Market opportunities and technical challenges for organic seed producers." In total, 116 participants (from 38 countries and more than 100 different institutions) were registered, and about 75 attended the workshop. Participants were part of various stakeholder groups (including national/regional authorities, NGOs, policymakers, suppliers of seed/plant breeding material, etc.). They discussed the main technical, economic, and regulatory challenges that organic seed producers face.

The workshop's objectives were to understand better their (de)motivation to produce organic seeds, point out significant challenges of upscaling organic seed and vegetative production for main crops in the EU (technical challenges, regulation, economy), and discuss potential solutions for reaching 100% organic seed from a technical, scaling, logistic, economic, and political point of view.

The workshop was also focused on the interactive and participatory approach via three sessions dealing with (i) technical challenges, (ii) economic challenges) and (iii) regulatory challenges. The sessions were moderated by project experts and organised using breakout rooms and the Klaxoon board.

In the end, a DirectPoll survey was conducted with participants, and six questions were asked. The questions focused on the technical, economic, and regulatory challenges that stakeholders face nowadays and what training is required to boost the proliferation of the organic seed sector.

3.4.1 Outcomes

The results of the brainstorming sessions with stakeholders are indicated below, according to the main categories: (i.) motivation, (ii) challenges in seed production, (iii) issues of scaling-up production, and (iv) needs to implement organic seed production.

Table 10 Feedback from the workshop participants

Category	Feedback from participants
Motivations for Producing Organic Seeds	- Economic incentives and higher costs of organic production. - Technical challenges associated with organic farming. - Regulatory barriers and certification complexity. - Lack of clear economic benefits to switching to organic production.
Major Challenges in Organic Seed Production	- Pest and disease management without synthetic chemicals. - Lower yield potential in organic systems. - Technical complexity in breeding seeds suited to organic conditions. - Seed quality control and storage - Limited availability of organic breeding programs for specific crops.
Issues in Scaling Up Organic Seed Production	- Higher operational costs and logistical challenges. - Inconsistent market demand for organic seeds. - Complex and time-consuming certification processes.
Needs to Implement Organic Seed Production	- More technical support and access to organic-specific breeding knowledge. - Financial incentives to offset higher production costs. - Clearer, more consistent regulatory frameworks. - Producers are willing to adopt organic seed production if financial incentives and technical training are provided. - Interest in adopting new techniques to improve seed quality and production efficiency. - Willingness to invest in organic production with more consistent market demand.

3.4.2 Technical Challenges in Organic Seed Production

The most significant technical challenges organic seed producers face include weed contamination and seed-borne pests and diseases, both receiving 23 votes. These issues are challenging in organic systems, especially for conventional initiatives due to the absence of synthetic herbicides and pesticides.

Another key challenge, with 21 votes, is finding enough farmers willing to multiply seeds, which reflects a need for better collaboration and incentives for farmers to participate in organic seed production.

Other challenges include hybrid propagation (19 votes), yield losses and volatility (16 votes) and storage and treatment (11 votes).

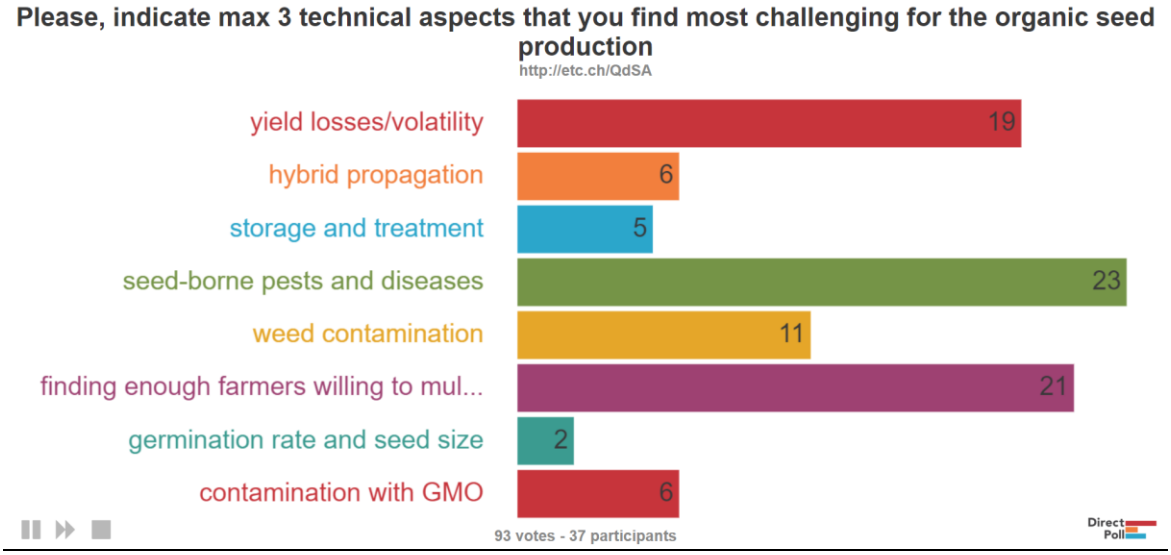


Figure 27 Technical challenges – workshop brainstorm

3.4.3 Economic Challenges in Organic Seed Production

The top economic concern is the low return on investment in dedicated organic seed production, which garnered 22 votes, highlighting that many producers find it challenging to make organic seed production financially viable.

Capital expenditure (CAPEX) for establishing organic infrastructure was another primary concern, with 16 votes, followed by operational expenditure (OPEX), with 13 votes, pointing to the high costs of setting up and maintaining organic seed production systems.

Other economic challenges included regulatory inconsistencies (12 votes), the cost of certification (5 votes) and education on financing models (5 votes).

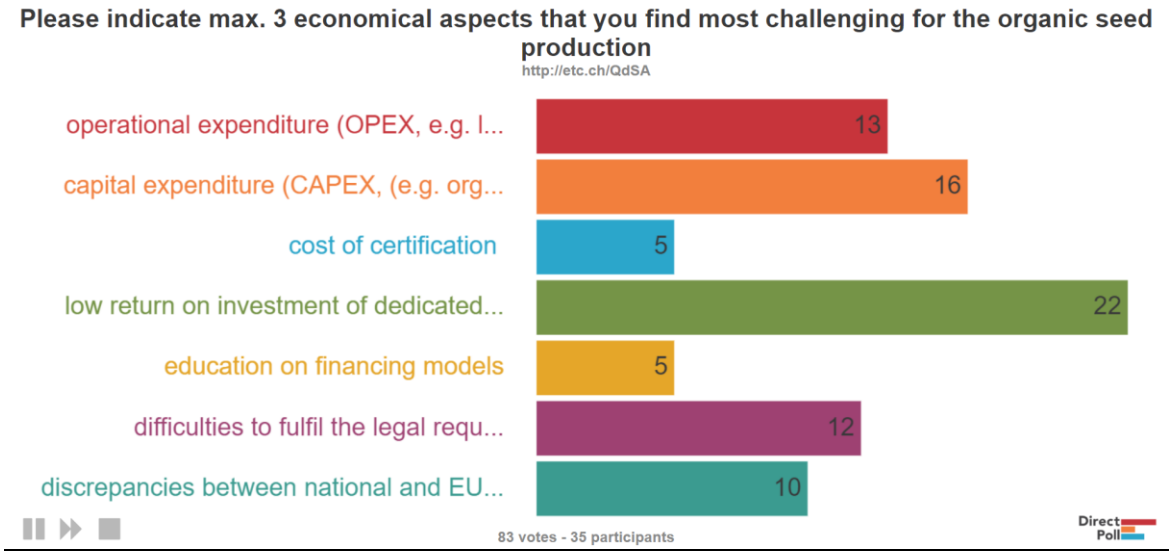


Figure 28 Economic challenges – workshop brainstorm

3.4.4 Regulatory Challenges Supporting Organic Seed Production

Regarding regulatory support, phasing out derogations for conventional seed use received the most support, with 23 votes. The need to establish interaction between policymakers and organic seed producers, which garnered 16 votes, underscores the importance of better communication and collaboration in shaping supportive regulations.

Introducing subsidies to support organic seed production was noted by 11 participants as a crucial financial measure to help offset the higher costs involved. Another critical regulatory need is providing a more extensive range of organic seed varieties, with 14 votes, to meet diverse market and environmental demands.

Finally, with 10 votes each, training on organic seed techniques and conducting more research on profitable seed varieties were identified as essential steps to enhance outcomes for organic seed producers.

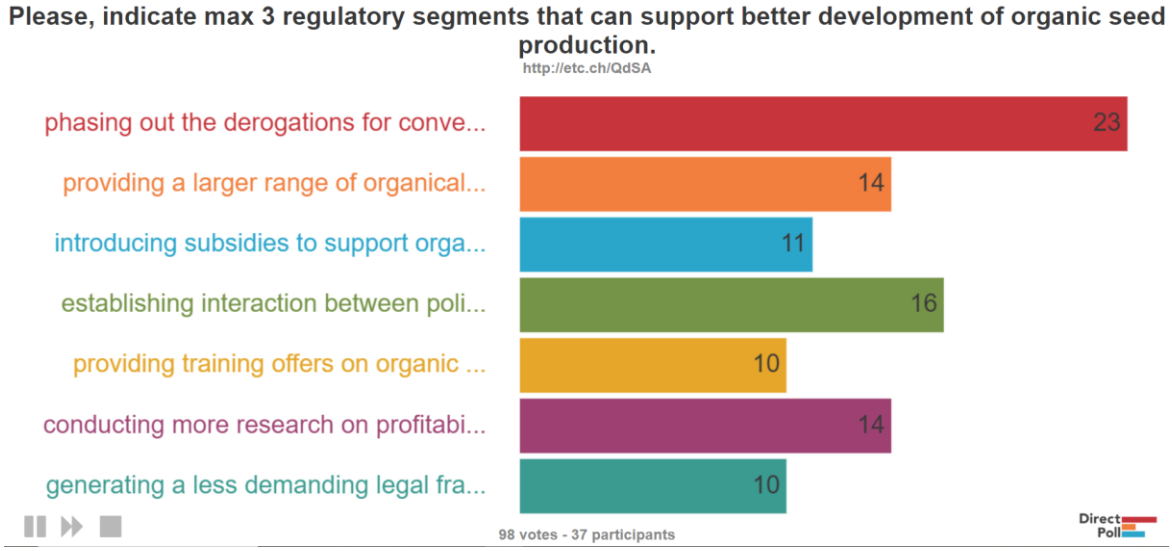


Figure 29 Regulatory challenges – workshop brainstorm

Most participants, 30 in total, expressed a desire to improve their knowledge of **policy and regulation**, indicating the importance of understanding regulatory frameworks for organic seed production. **Organisation models and governance** was the second most popular topic, with 17 votes, suggesting a need for better management and operational strategies. **Entrepreneurship and business planning** received only 10 votes, highlighting interest in strengthening business and financial planning skills. **Financing and investment management**, with 8 votes, shows a moderate interest in learning how to secure and manage funding. Finally, **marketing** was the least prioritised area, with only 7 votes, implying that participants see other topics as more pressing.

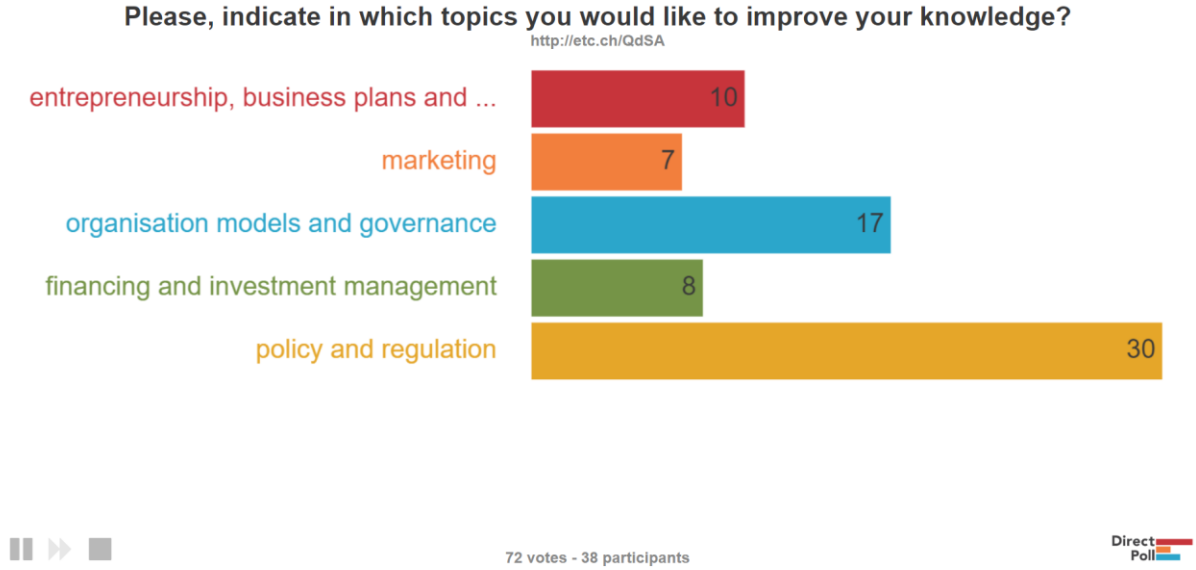


Figure 30 Training topics – workshop brainstorm

3.4.5 Key conclusion points

The workshop provided critical insights into the motivations, challenges, and needs of stakeholders involved in the organic seed sector.

The discussions highlighted several key challenges, such as weed presence, seed-borne pests, and the difficulty of finding farmers willing to multiply organic seeds. Economic concerns included high operational and capital expenditures and the low return on investment for organic seed production. Additionally, regulatory barriers, such as the complex and inconsistent certification processes, further complicate the transition to organic seed systems.

Participants expressed a strong desire for improved knowledge of policy and regulation, underlining the need for better communication between policymakers and seed producers. They also emphasised the importance of financial incentives, technical training, and more straightforward rules to facilitate the scaling-up of organic seed production. The workshop provided a roadmap for addressing these challenges and moving towards 100% organic seed production in the EU.

4. Conclusions and recommendations by typology

A new "Business Birdview" (BB) tool has been developed. The template integrates internal and external challenges, opportunities, and key strategic elements to provide a streamlined, holistic view of a business.

It combines insights from SWOT analysis and the Business Model Canvas into three sections: (i) Challenges of Today, identifying internal and external bottlenecks; (ii) Sounds Like Opportunity", highlighting growth opportunities, unique value propositions, and customer strategies; and (iii) "Future is Organic", focusing on profitability and strategic recommendations.

This approach simplifies complex business analysis, making insights easily digestible for stakeholders and aiding in more informed decision-making.

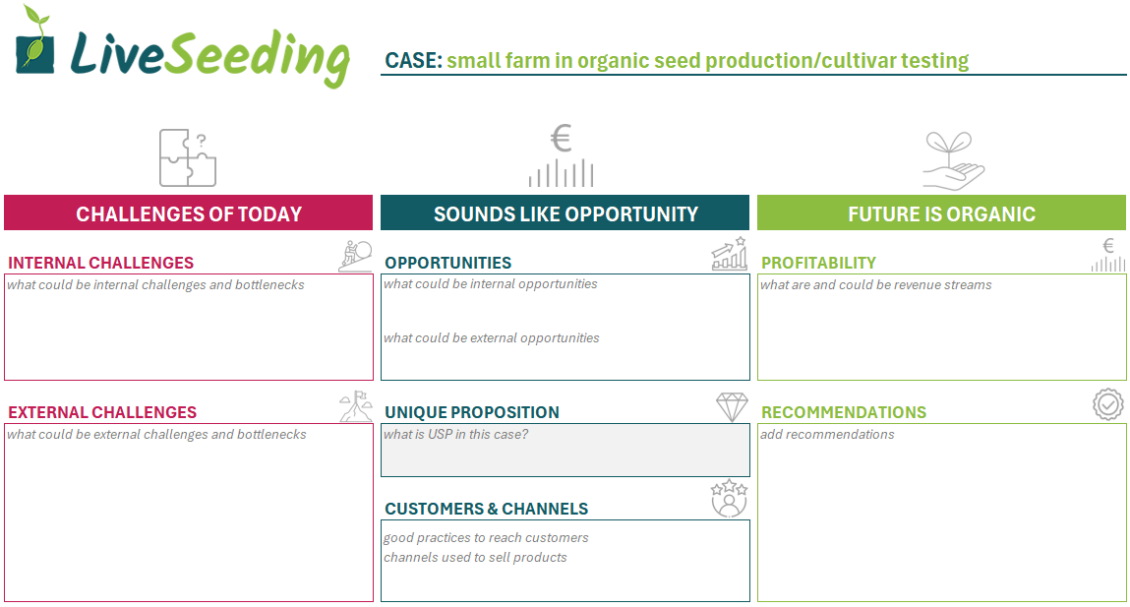


Figure 31 Business Birdview template

As it was the case before, the same typology was followed:

Typology	Categories
TYPE OF ORGANIZATION	Company Initiative Research Centre
TYPE OF ACTIVITY	Seed production and trading Cultivar testing
CROP TYPE	Vegetable producers Arable producers
TYPE OF PRODUCTION	Organic production Organic & conventional production

4.1 TYPE OF ACTIVITY

Internal and External Challenges

Seed Production and Cultivar Testing share several internal and external challenges, but they have key differences in focus.

Seed Production's internal challenges revolve around finding skilled labour, dependence on external funding, and high production costs, especially in organic farming. There are also scalability issues and the seasonal nature of work, making it harder to retain workers. The sector struggles with limited technological infrastructure and competition from other seed producers, which affects market visibility.

In contrast, Cultivar Testing faces more structural challenges, such as bureaucratic inefficiencies due to multiple hierarchy levels and a heavy reliance on public grants. A shortage of knowledgeable staff and communication issues between internal and external stakeholders are also significant problems. Cultivar testing also deals with reduced government support, financial insecurity from both public and private sectors, political shifts and regulatory hurdles.

Externally, both sectors are affected by market competition and the small size of the organic market. However, Seed Production struggles more with the administrative burden of organic farming certifications and high production costs, while Cultivar Testing is impacted by economic uncertainty and shifting consumer preferences.

Opportunities

Regarding opportunities, both Seed Production and Cultivar Testing emphasise collaboration and partnerships as critical avenues for growth. Seed Production focuses on expanding international exports and embracing technological advancements to increase efficiency and market reach. The sector sees opportunities in research and development for creating new seed varieties that can adapt to climate change, alongside leveraging EU funding for innovation.

On the other hand, Cultivar Testing emphasises using digital platforms and technology for data analysis and expanding market opportunities. It also focuses on leveraging public awareness and the growing demand for organic products to enhance market visibility. Strengthening partnerships with international bodies and leveraging advancements in agricultural technology are other core opportunities for this sector.

Profitability

When comparing profitability, Seed Production highlights diverse revenue streams, including domestic and international seed sales and research and development aimed at producing resilient seeds adapted to changing climatic conditions. Another critical source of revenue for seed producers is certification fees, which allow them to market their products as organic, adding value in the increasingly environmentally conscious market. Moreover, there is a growing trend in utilising online sales and e-commerce to expand their customer base, while partnerships with national and international entities further boost profitability.

In contrast, Cultivar Testing emphasises income generated through cultivar sales, including export opportunities. Like seed producers, cultivar testers also derive profitability from certification fees and research and development, focusing on selling specific seed varieties and providing related educational services. Additionally, digital platforms and data and analytics services serve as new profit streams, providing

valuable agricultural insights to farmers and stakeholders. Finally, educational workshops and training represent a growing profitability segment as the demand for knowledge and innovation in the farming industry continues to rise.

Recommendations

For Seed Production, the primary recommendations focus on enhancing technological integration, such as investing in modern agricultural technologies and adopting digital platforms for better efficiency and precision. Advocating for supportive policies and regulations, leveraging collaborative networks, and staying aligned with emerging agricultural trends are also recommended. Additionally, ensuring financial sustainability and adapting to climate change are crucial for long-term growth. Seed producers are encouraged to expand their market reach and diversify funding sources to mitigate financial risks.

In contrast, recommendations for Cultivar Testing emphasise the adoption of new digital technologies and the training of workers to implement these advancements. There is also a focus on launching educational campaigns to raise awareness of organic farming and its benefits. Staying informed about industry trends and consumer preferences is vital for adaptability. Moreover, recommendations include enhancing market visibility, ensuring financial stability through diversification, and pushing the boundaries in research and development to remain competitive in the face of climate change and other agricultural challenges. Diversifying funding sources is also recommended to ensure the long-term viability of testing programs.

Conclusion

In summary, while Seed Production and Cultivar Testing share joint opportunities and challenges, their paths to profitability and strategic recommendations differ.

Both sectors are advised to embrace technology, adapt to market trends, and secure stable funding, but the specific approaches reflect their unique roles within the agricultural sector.

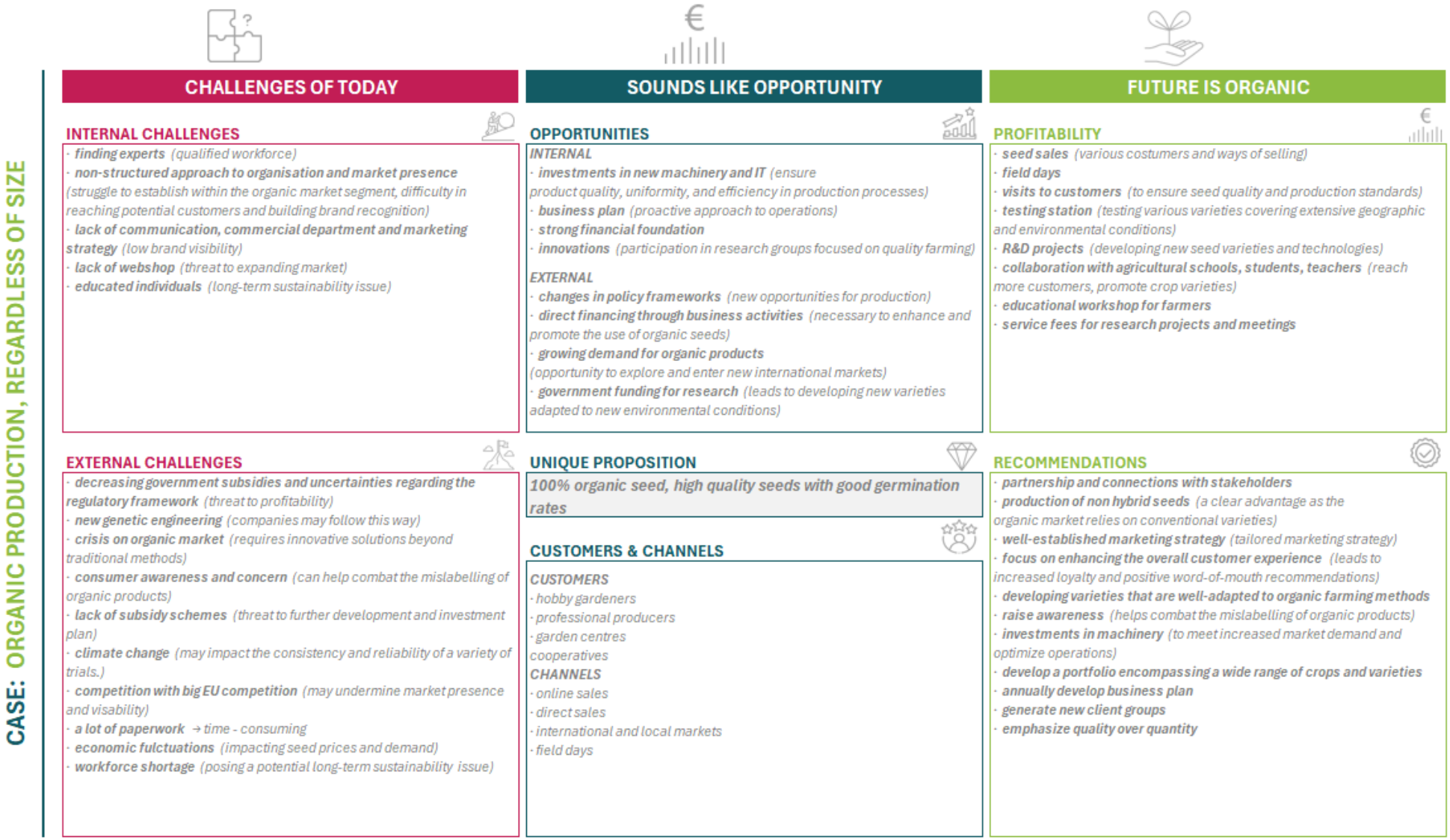


Figure 32 Business Birdview – organic seed production

CASE: CULTIVAR TESTING, REGARDLESS OF SIZE

CHALLENGES OF TODAY

INTERNAL CHALLENGES

- **extensive network and multiple levels of hierarchy** (bureaucratic inefficiencies and slower decision-making processes)
- **reliance heavily on public grants** (poses a risk if subsidies are reduced or unavailable)
- **small number of knowledgeable staff** (experts who have a deep understanding of organic production)
- **internal and external communication** (for better information sharing and stakeholder engagement)

EXTERNAL CHALLENGES

- **market for organic varieties is small** (not enough interest)
- **reduced funding from government and private sectors** (financial insecurity)
- **shifts in political priorities** (focusing on other departments)
- **complex regulations and registration** (time-consuming)
- **economic uncertainty and fluctuations**
- **competition from large-scale enterprises** (uncertainty for market expand)
- **climate change** (small yield)
- **shifting consumer preferences and market trends**

SOUNDS LIKE OPPORTUNITY

OPPORTUNITIES

INTERNAL

- **leveraging online platforms and exploring export opportunities for local varieties**
- **investing in innovation and technology** (e.g. drones, data analysis)
- **funding from various sources** (internal or external to ensure long-term stability)

EXTERNAL

- **growing demand for organic products** (opportunity to expand market)
- **strengthening ties with international bodies, industry leaders, seed companies, stakeholders** (enhance knowledge exchange and adoption of best practices)
- **leveraging advancements in agricultural technology and data analytics**
- **increasing public awareness** (help combat the mislabelling of organic products)

UNIQUE PROPOSITION

Unique cultivar evaluation methods and extensive data analysis.

CUSTOMERS & CHANNELS

CUSTOMERS

- professional growers
- breeders and seed producers
- local farmers/multipliers
- research and educational institutions

CHANNELS

- direct sales (face to face)
- webshops and digital platforms
- customer fields and open field days

FUTURE IS ORGANIC

PROFITABILITY

- **cultivar sales** (various customers and channels)
- **cultivar sales export** (international sale)
- **Research and Development** (participation in researches and developing new varieties)
- **certification fees** (certifying seeds as organic or meeting other specific standards)
- **digital platforms** (for seed sales, education, and farmer engagement)
- **data and analytics services** (selling agricultural data and analytics services to farmers and industry stakeholders)
- **educational workshops and training** (for conducting workshops, training sessions, and educational programs)

RECOMMENDATIONS

- **invest in new digital technologies and training programs for workers** (to adapt to new digital technologies and start to implementing them)
- **launch educational campaigns to increase awareness** (about organic farming and the benefits of organic sseds)
- **stay informed about industry trends and its impacts in consumer preferences**
- **adapting to climate change** (improving nutritional value) and **technological challenges** (enhance production efficiency)
- **enhancing market reach and visibility**
- **financial sustainability and diversification**
- **diversify funding sources and financial models** (to mitigate financial risks and ensure long-term stability)

Figure 33 Business Birdview – Cultivar testing

4.2 TYPE OF ORGANISATION

Several similarities and differences emerge when analysing the SWOTs of Companies, Initiatives, and Research Centres focused on seed production. These distinctions highlight the unique challenges, opportunities, and paths to profitability each organisational type faces.

Internal Challenges

All three organisational types face workforce management issues, particularly in recruiting skilled labour. Companies struggle with high production costs and maintaining customer relationships, while Initiatives and Research Centres rely on external funding and resource constraints. The seasonality of the work and the burden of bureaucratic inefficiencies are common themes.

Each organisation type also emphasises the need for a solid commercial strategy. Companies focus more on scalability and production capacity, while Initiatives have difficulties in developing commercial strategies, and Research Centres experience issues with communicating internally and externally.

External Challenges

A significant challenge across the board is related to regulatory pressures. All three types of organisations struggle with complex regulations and policy uncertainties. Companies face hurdles from organic rules and competition from larger enterprises. Similarly, Initiatives are hindered by economic instability, and Research Centres face challenges from shifting political priorities and fluctuating government support. Furthermore, climate change and fluctuations in market trends pose significant external threats to all organisations, affecting yield and the ability to remain competitive in the market.

Opportunities

Collaboration stands out as a shared opportunity. Companies, Initiatives, and Research Centres all see potential in partnering with other stakeholders, be it local farmers, international bodies, or research institutions.

On the other side, leveraging technological advancements like digital tools and data analytics is another shared opportunity, helping these organisations optimise production and reach new markets. Furthermore, expanding into international markets and increasing public awareness about the benefits of organic products and sustainable agriculture provide growth potential for all three.

Differences that emerge across organisational types refer to internal focus points. Companies focus more on operational efficiency, profitability, and market diversification. They invest in IT systems, aim for compliance with organic standards, and are driven by profitability through seed sales, export opportunities, and consulting services.

Initiatives, on the other hand, emphasise promoting local plant diversity and preserving biodiversity. Their internal focus is on creating partnerships with local farmers and research communities and utilizing advocacy efforts to shape policies.

Research Centres are more research-focused. They work on extensive cultivar evaluation and use their expertise to support organic farming through dedicated breeding activities. They emphasise long-term partnerships with academic institutions and governments to drive innovation and ensure financial stability.

Commercialisation and Profitability

Companies are highly focused on profit generation through diversified product offerings and the commercialisation of new seeds.

Initiatives focus less on immediate profitability and prioritise biodiversity conservation and sustainability. They are beginning to explore avenues like workshops and training programs to add revenue streams.

Research Centres generate income through public and private grants. Revenue also often comes from certification fees, partnerships with industry stakeholders, and educational services like training programs.

Profitability

When considering profitability, each organisational type has its unique approach:

Seed sales across various channels, including export markets, drive company profitability, which is further bolstered by consulting services and certification fees. Additionally, companies engage in research and development (R&D), which allows them to develop high-value, speciality seed varieties tailored to market needs. Companies also benefit from licensing royalties and educational services, adding a variety of revenue streams to ensure profitability.

Initiatives' profitability is tied to more sustainable programs, including educational workshops and training. They also derive income from seed sales and export sales but with less focus on maximising profitability and more on supporting biodiversity and conservation. Initiatives' future profitability depends on their ability to diversify revenue streams while reducing their reliance on grants and subsidies.

Research centres generate revenue through public and private funding from grants, agricultural organisations, and industry stakeholders. Eventual certification fees and collaborations with national and international entities provide additional income. By focusing on specialised research, consulting services, and educational programs,

research centres aim to improve profitability while expanding their role in developing sustainable agricultural practices.

Recommendations

The recommendations for each organisational type reflect their unique positions in the seed production industry.

The primary recommendations for companies include investing in new digital technologies, streamlining operations to reduce production costs, and improving customer relationship management through CRM (costumer relationship management) systems. Companies are also encouraged to focus on expanding their market reach by adopting new business models and increasing their participation in R&D. Compliance with organic standards remains crucial, and adopting a forward-looking strategy for climate change resilience will ensure long-term success.

Initiatives should prioritise financial sustainability and diversification of revenue streams to reduce reliance on external funding. Building organisational capacity, expanding market reach and visibility, and increasing collaborations with research organisations and government bodies will help initiatives strengthen their position. Advocacy for supportive policies and adapting to technological challenges should be a focus, alongside continuing efforts in biodiversity management.

Research centres should enhance technological integration by investing in advanced agricultural technologies like drones and data analytics to improve efficiency. Further recommendations include strengthening stakeholder engagement, expanding organic breeding programs, and diversifying funding sources. Research centres are encouraged to build more robust collaborative networks and focus on securing long-term financial stability through diversified revenue streams, such as educational services and certification programs.

Conclusion

In conclusion, while Companies, Initiatives, and Research Centres share many challenges and opportunities, they differ in their approaches to profitability and strategic recommendations. Companies are highly profit-driven and focused on operational efficiency, while initiatives prioritise sustainability and biodiversity. Research centres occupy a middle ground, focusing on research-led innovations and collaborative efforts to secure funding and generate revenue. Each organisation type is encouraged to embrace technological advancements, strengthen partnerships, and adapt to emerging agricultural trends to ensure long-term success in the seed production industry.

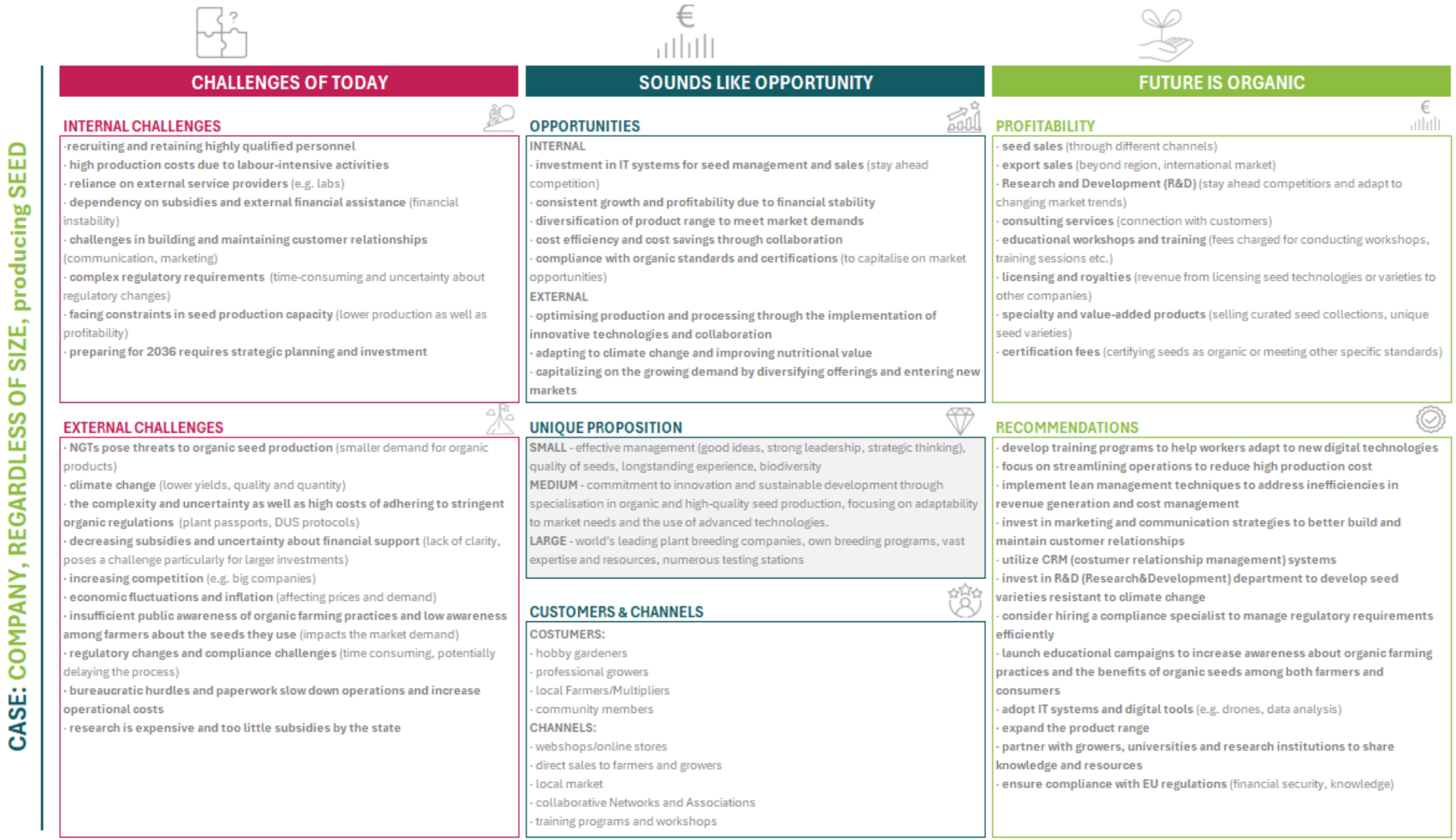


Figure 34 Business Birdview – Company

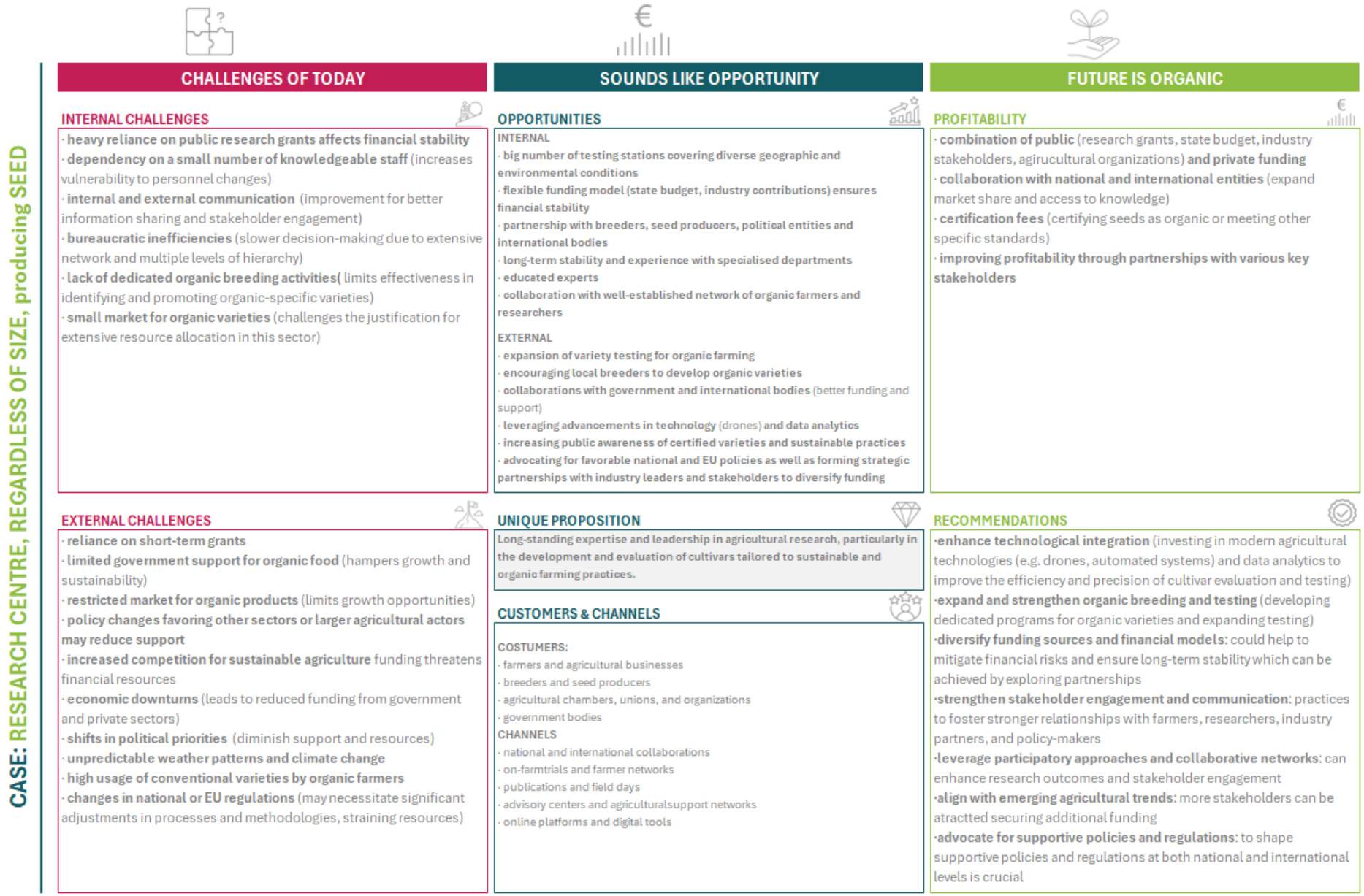


Figure 35 Business Birdview – Research Centre

CASE: INITIATIVES, REGARDLESS OF SIZE, producing SEED

CHALLENGES OF TODAY

INTERNAL CHALLENGES

- **vulnerability to fluctuations in funding availability due to heavy reliance on external funds, grants, or subsidies**
- **resource constraints** (impacts the ability to achieve goals, expand operations, or support networks effectively)
- **lack of commercial strategy or reluctance to commercialize** (limiting market reach and revenue potential)

EXTERNAL CHALLENGES

- **economic instability and fluctuations in funding** (pose a threat to financial sustainability and operational continuity)
- **competition from larger agricultural enterprises or commercial seed companies** (undermine market presence and viability)
- **climate change** (threat to agricultural production, adaptability, resilience, and operational goals)
- **regulatory and policy challenges related to seed production, certification, and agricultural subsidies** (increase administrative burdens and hinder growth)
- **shifting consumer preferences and market trends** (impacts demand, requires adaptation in strategies and offerings)

SOUNDS LIKE OPPORTUNITY

OPPORTUNITIES

INTERNAL

- extensive collaboration and partnerships with local farmers, communities, and professionals
- expertise in leadership and innovative approaches to agriculture and seed preservation
- commitment to preserving local plant diversity and biodiversity
- strong financial stability and support from multiple sources, including grants and subsidies

EXTERNAL

- opportunities to enhance operations through the adoption of digital tools, automation, or other technological innovations
- potential to collaborate with research organizations, governmental agencies, NGOs to strengthen efforts and reach common goals
- exploring opportunities to expand customer bases (online platforms, or new markets)
- using advocacy efforts to shape policies that support sustainability, biodiversity conservation

UNIQUE PROPOSITION

Expertise in preserving and promoting local plant diversity through strong regional partnerships and innovative, biodiversity-focused agricultural practices, combined with minimal competition in their respective areas.

CUSTOMERS & CHANNELS

- hobby gardeners
- professional growers
- local farmers/multipliers
- community members
- store buyers
- research and educational institutions

CHANNELS:

- webshops/online stores
- direct sales to farmers and growers
- local market
- collaborative Networks and Associations
- training programs and workshops

FUTURE IS ORGANIC

PROFITABILITY

- **seed sales** (selling through different channels to different customers)
- **educational workshops and training** (for conducting workshops, training sessions, and educational programs)
- **service fee for research projects**
- **export sales** (beyond region, international market)
- **field days**
- **sustainability programs** (charging for certification and consultation on sustainable farming practices)

RECOMMENDATIONS

- **financial sustainability and diversification** (diversify revenue streams and reduce dependence on grants and subsidies)
- **strengthening organizational capacity** (capacity building, recruitment of specialized personnel)
- **enhancing market reach and visibility** (essential for growth and sustainability)
- **advocacy and policy influence** (actively engage in advocacy, collaborations with agricultural organisations, raising awareness)
- **adapting to climate change and technological challenges** (diversifying crops or modifying cultivation practices)
- **expanding partnerships and collaborations** (sharing knowledge and access to market)

Figure 36 Business Birdview – Initiative

4.3 CROP TYPE

Internal and External Challenges

Vegetable Seed Producers face internal challenges such as financial constraints, reliance on grants, and difficulty finding a motivated workforce, especially workers willing to implement digital technologies. These producers also sometimes struggle with a lack of commercial strategy and a business plan or model, which impacts efficiency and market visibility. Externally, they are challenged by complex regulations and registration, competition from large-scale enterprises, and shifting market demands. The lack of modern tools and changes in seed production and certification regulations are additional hurdles.

On the other hand, Arable Seed Producers experience internal challenges that are more centred around staff retention due to the seasonality of work and lower yields. Like vegetable producers, they also lack a structured approach to market presence and a lack of business models, making them vulnerable to market changes. Externally, arable seed producers face short-term funding risks, competition with larger actors, and the threat of climate change and economic downturns affecting agricultural production.

Despite these differences, both production types share concerns about reliance on external funding, economic instability, and regulatory hurdles related to seed production and certification. Both are also impacted by market trends that impacts consumer preferences, though these factors manifest differently depending on the specific market each type targets.

Opportunities

Vegetable Seed Producers and Arable Seed Producers recognise the potential for growth through technological investments and collaborations with various stakeholders, such as research groups, government bodies, and industry players.

For Vegetable Seed Producers, opportunities include leveraging online platforms to expand market reach, investing in innovations and technology, and adapting to climate change by developing seed varieties that are resilient and better suited for future environmental conditions. Additionally, preserving local varieties and organic production are key growth areas. Externally, opportunities lie in participation in research groups and collaboration with government entities, which could lead to expanded networks and enhanced production strategies.

Arable Seed Producers have similar opportunities but with a more focused approach to data analysis, investment in new facilities, and crop rotation systems to enrich soils and improve yield. They see potential in collaborating with government bodies and

research stations and streamlining bureaucratic processes to ensure smoother regulatory compliance and faster market entry.
While both sectors aim to expand their market presence and invest in new technologies, vegetable producers emphasise organic and local seed varieties more. In contrast, arable seed producers focus on optimising production efficiency through innovations like crop rotation and data-driven decision-making.

Profitability

Vegetable Seed Producers derive profitability from a diverse range of activities. They focus on building and maintaining distribution hubs for products sourced from Europe, allowing them to reach multiple market levels. Their key profit generators include seed sales, collaboration with national and international entities, and research and development efforts aimed at developing new seed varieties and technologies. Certification fees (for organic and other standards) and educational workshops also provide supplementary revenue streams. These producers see the value in expanding into international markets and building strong relationships to enhance their market presence and secure profitability.
Arable Seed Producers, on the other hand, focus on collaboration with eminent companies and producers, generating new client groups and expanding their portfolio. Their profitability also stems from membership fees and stakeholder collaborations, which provide more stable and continuous funding. Other revenue sources include training station funds, service fees for research projects, and regional subsidies. While vegetable producers rely on organic certification and educational programs for additional revenue, arable producers focus more on building a wide-ranging client base through collaborations and research-driven projects.
Both sectors see the importance of expanding market reach through exports and specialised seed varieties. Still, vegetable producers lean more heavily on educational services and certification, whereas arable producers benefit more from research-driven revenue streams and collaborations with stakeholders.

Recommendations

For Vegetable Seed Producers, recommendations focus on investing in research and development to develop seed varieties that are more adaptable to changing climates. Expanding their market beyond the local region is also crucial, as is focusing on digitalisation by adopting technologies and data analysis. Collaboration with producers, researchers, and agricultural schools is recommended to enhance knowledge-sharing and collect valuable insights for future growth. Furthermore, adapting to climate change and ensuring compliance with European regulations are key priorities for maintaining profitability and growth. A comprehensive business plan

and commercial strategy is essential to improve market visibility and operational efficiency.

For Arable Seed Producers, the recommendations emphasise the need to develop a novel approach to marketing varieties and to expand the market to include a broader range of crops, including old, local, and traditional varieties. Incorporating digital tools to improve efficiency and make data-driven decisions is crucial for enhancing production. Prioritising consumer needs and interests is another recommendation to ensure the overall experience aligns with market trends. Collaborating with research institutions and government bodies is also advised to leverage knowledge and secure necessary funding. Advocating for supportive policies and regulations and diversifying crops and varieties are also recommended to future-proof the production process against market fluctuations and environmental changes.

Conclusion

In conclusion, Vegetable Seed Producers and Arable Seed Producers share similar challenges related to funding, market trends, and regulatory pressures. Still, they differ in their focus areas and strategies for growth. Vegetable seed producers prioritise organic production and preserving local varieties, strongly emphasising educational services and organic certification. In contrast, arable seed producers focus more on production optimisation, collaborations, and research-driven profitability. Both sectors recognise the need for technological innovation and partnerships, but their approaches to profitability and growth are tailored to their specific markets and production systems.

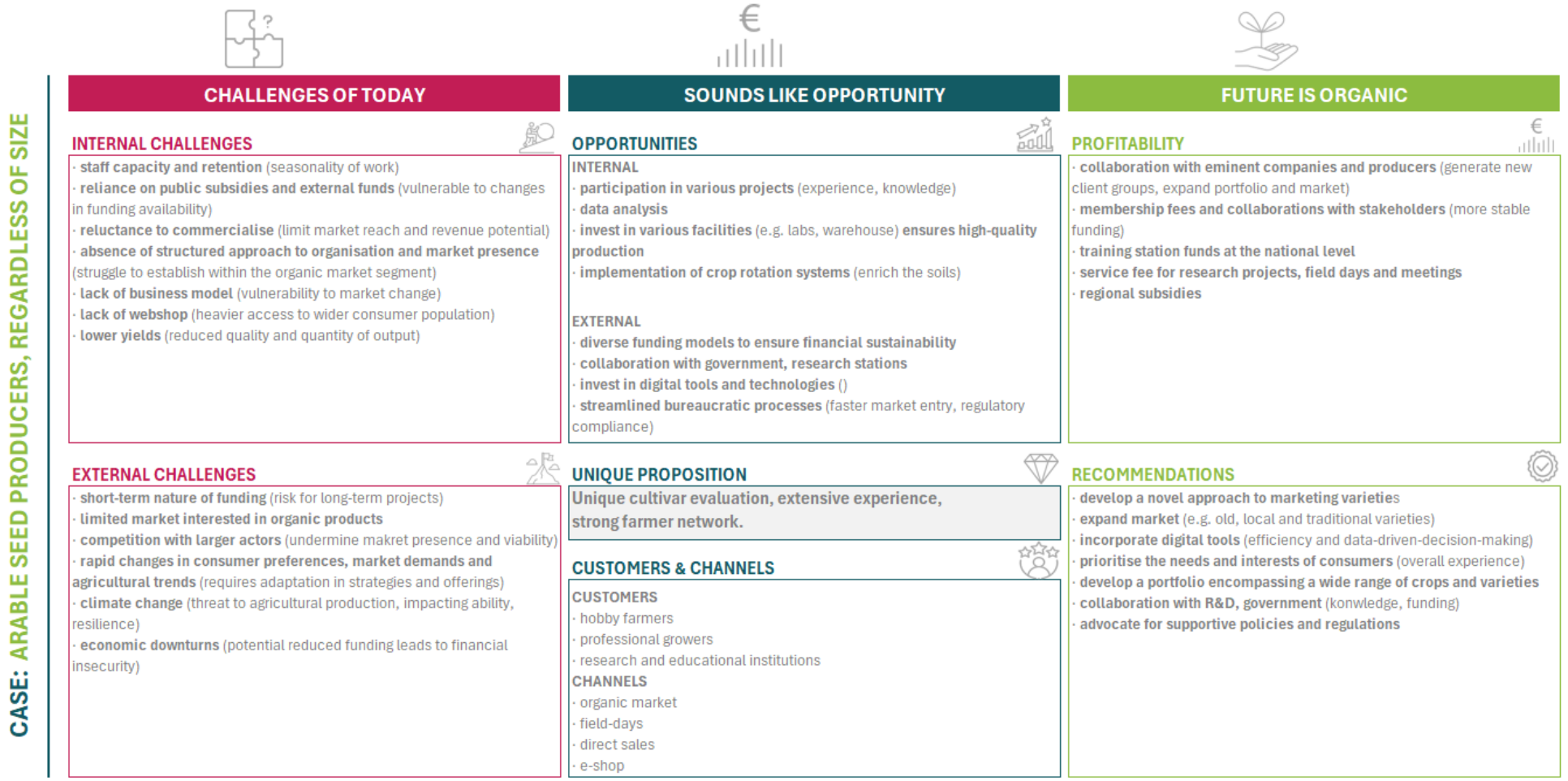


Figure 37 Business Birdview – arable production

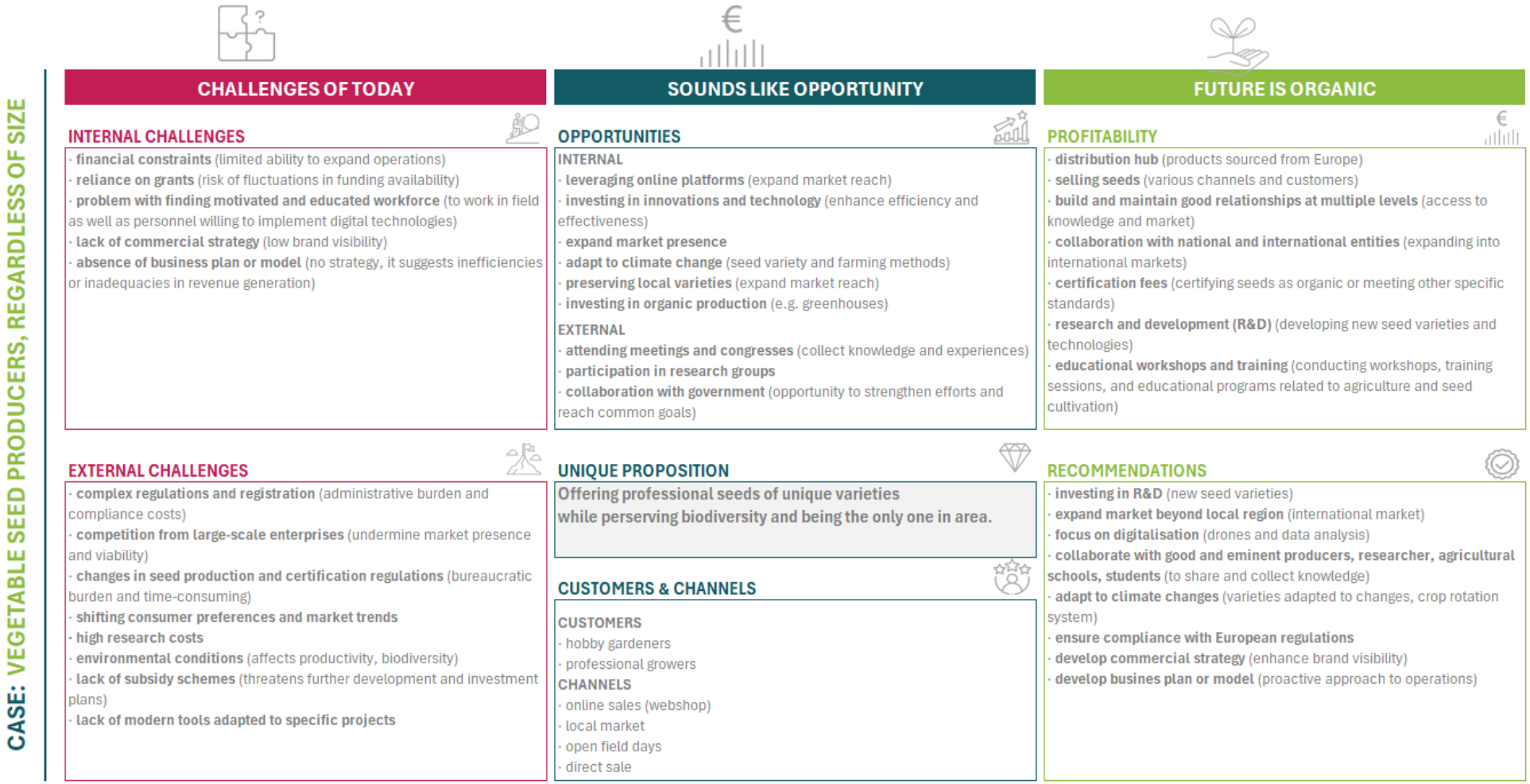


Figure 38 Business Birdview – vegetable

4.4 PRODUCTION TYPE

Internal and External Challenges

Organic and Conventional Production (Combined) face internal challenges such as high production costs, particularly in manual labour tasks like weeding, which affects profitability. The low ratio of organic to conventional farming presents another obstacle, as the organic sector still has a relatively small market footprint. Other challenges include reliance on internal budgets without external funding, the lack of an online sales system, and limited access to the broader market. Workforce shortages and the reliance on EU subsidies pose additional risks for future growth.

Externally, this combined production type contends with fluctuations in market demand, competition from larger enterprises, and complex seed certification and production regulations. Rising input costs and climate change further exacerbate the operational difficulties, while the lack of subsidy schemes threatens investment plans' future development and expansion.

Organic Production faces internal challenges in finding qualified experts and building a commercial strategy for market presence. The sector also struggles with the lack of a webshop, which restricts market expansion and brand recognition. Another long-term issue is the insufficient number of educated individuals to sustain and drive the industry forward.

Externally, organic producers encounter uncertainties in regulatory policies and decreasing subsidies for organic farming. The rise of new genetic engineering technologies and competition from EU agricultural enterprises further threaten their position. Economic fluctuations, climate change, and the lack of consumer awareness about the benefits of organic farming also present significant challenges.

Both productions struggle with regulatory pressures, competition from larger enterprises, and challenges related to economic sustainability.

Profitability

In terms of profitability, both Organic and Conventional Production and Organic Production recognise the importance of seed sales across different channels, including international markets. However, their approaches differ slightly.

Organic and Conventional Production derive significant profitability from seed sales and collaborations with ministries of agriculture and other government entities. Building long relationships with agricultural schools and research institutions ensures consistent demand for their seed varieties. Additional profitability is achieved through testing stations, consultant services, and the sale of products through online shops. The emphasis on educational workshops and training sessions also brings in revenue and open field days, crucial for customer engagement and visibility.

In contrast, Organic Production focuses heavily on building partnerships with schools, teachers, and agricultural experts to promote organic crop varieties and expand market visibility. Their profitability model is supported by R&D projects that allow the development

of new seed varieties tailored to market demands and environmental conditions. Testing stations and field days are also key contributors to revenue, while collaboration with stakeholders in the organic sector is essential to ensuring long-term profitability.

Recommendations

The recommendations for Organic and Conventional Production emphasise improving operational efficiency through investment in research and development (R&D) and digital tools. Expanding into international markets is crucial, and efforts should be made to collaborate with good producers and research experts to stay ahead of competitors. Addressing climate change by adapting seed varieties and farming methods is vital for long-term sustainability. Additionally, improving the overall customer experience and reducing the use of pesticides and fertilisers should be priorities to enhance the appeal of organic products. Finally, developing a system for customer reporting and communication is recommended to improve customer relations and feedback.

In contrast, Organic Production requires a more tailored marketing approach. The key recommendations for this sector include forming strong partnerships with stakeholders and focusing on non-hybrid seed production to gain a competitive edge. Investments in machinery to meet market demand and scale operations are crucial, as is the need for a well-established marketing strategy emphasising customer experience and quality over quantity. Organic producers should also focus on raising awareness about the benefits of organic farming and adapting seed varieties to organic farming methods. Lastly, a comprehensive business plan should be developed to diversify the product portfolio and generate new client groups.

Both production types need to invest in R&D and marketing strategies. While organic and Conventional Production emphasize the customer experience and adapting to environmental changes, Organic Production focuses on forming key partnerships, raising awareness, and developing specialised seed varieties to meet the demands of organic farming.

Conclusion

In conclusion, while Organic and Conventional Production and Organic Production share common challenges related to regulatory pressures, funding, and competition, their strategic focuses differ. Organic and Conventional Production prioritises scaling through collaborations with government entities, online sales, and reducing input costs. At the same time, Organic Production focuses more on developing non-hybrid seeds, raising awareness, and forming solid partnerships within the organic market. Both sectors see R&D, customer experience, and climate change adaptation as crucial to future success, but their specific approaches reflect the nuances of their production models.

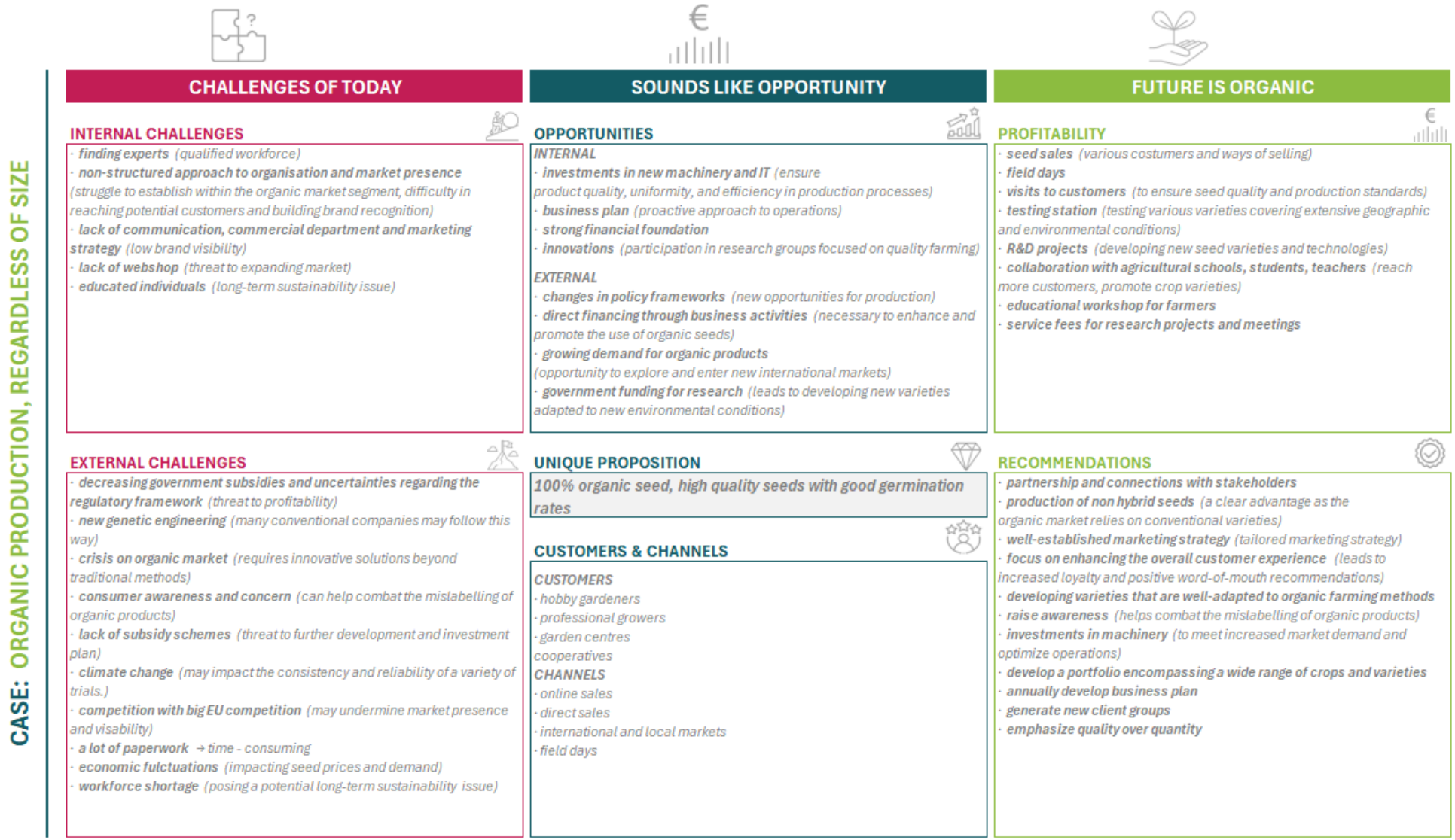


Figure 39 Business Birdview – organic production

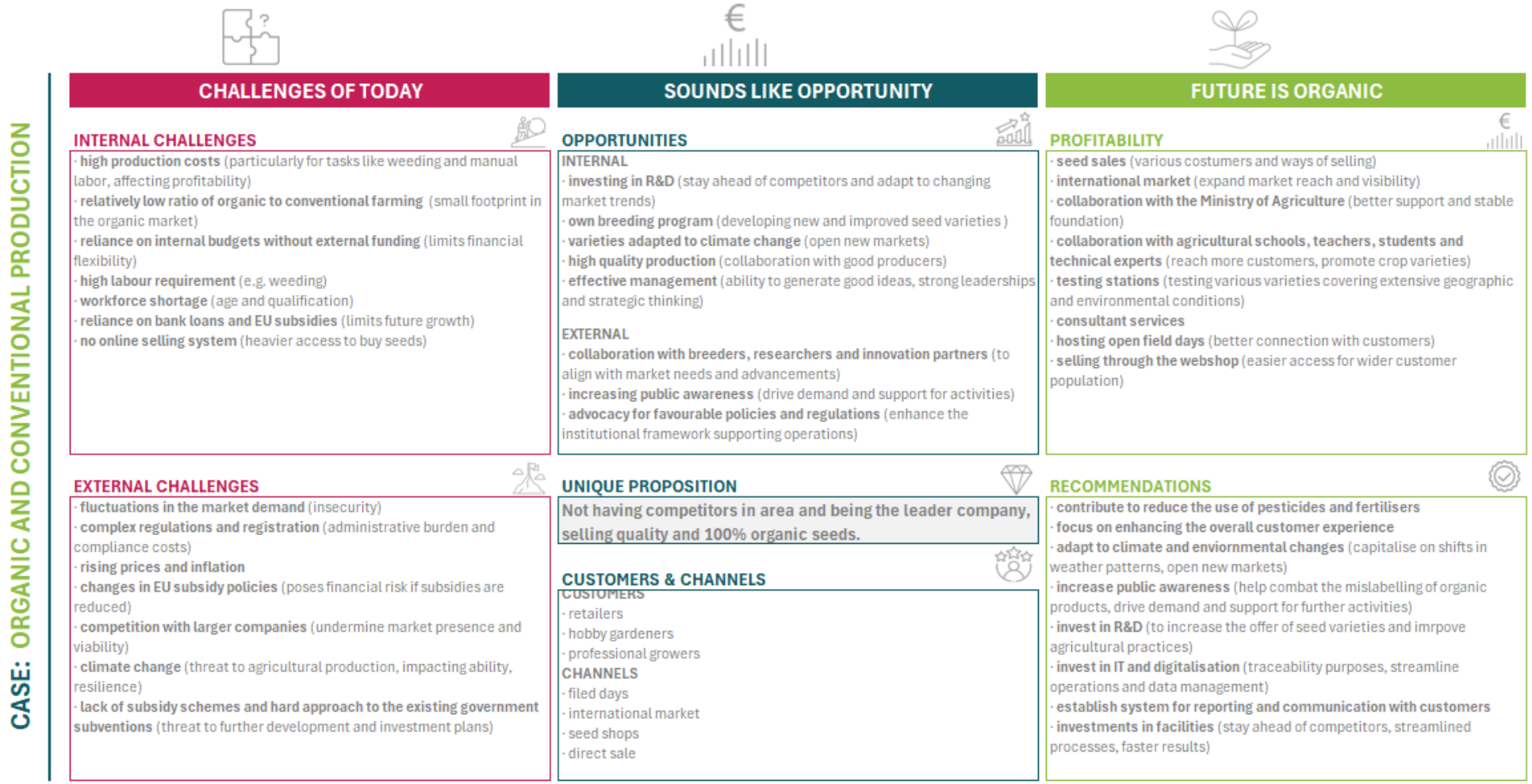


Figure 40 Business Birdview – Organic and conventional production

5. Conclusions and Recommendations

5.1 Customers and Channels

Customer lead covers all customer fields, from hobby gardeners interested in organic and local seed varieties for personal use to professional growers and government bodies. Local farmers are involved in cultivating, planting, and preserving local plant varieties. On the one hand, there are store buyers who purchase seeds for resale or use seeds in more extensive operations, and on the other hand, there are breeders and seed producers.

Figure 41 Overview of customers and channels

Possible channels are various, and customer leads cover all ranges of levels. Some channels are direct or face-to-face through open field days, training programs and workshops, and national and international collaborations. These allow seeds to be sold directly, reach a broader audience, and share knowledge and experiences. Some are online through web shops and digital platforms, which allow seeds to be sold directly to a broad audience, including international customers.

Profitability in general can be increased by selling seeds to national and international markets or participating in Research & Development projects from developing organic seed varieties and technologies. Other potential hides in various subscription services, cooperative and shared services, consulting services, educational workshops and training where income can be provided from fees charged for conducting seminars, training sessions, and educational programs related to organic farming methods or services offered within a cooperative model, such as agronomic support or shared

profit among members. Another method to enhance profitability can be licensing and royalties, where revenue comes from licensing organic seed technology or varieties to other companies. Moreover, certification fees are great method where income comes from certifying seeds as organic or meeting other specific standards. Also, testing stations can provide income by testing various varieties that cover extensive geographic and environmental conditions. Furthermore, selling agricultural data and analytics services to farmers and industry stakeholders can also provide income.

Recommendations can be divided into five fields: collaborations, marketing and internal strategies, investments, markets and consumers, and finances.

Collaborations and partnerships with research institutions, growers, and universities lead to cost savings, innovative solutions, and access to resources, knowledge, and various markets.

In terms of marketing and internal strategies, developing training programs could help workers to adapt to new digital technologies, adopt IT systems and digital tools and plant information systems to streamline seed management and sale processes, prepare for threats to ensure resilience and enhance market reach and visibility. Investment in marketing and communication strategies builds and maintains customer relationships, and investments in R&D develop seed varieties that can adapt to climate change.

Financial sustainability and diversification are crucial to making investments possible. Diversifying funding sources and financial models could help mitigate financial risk and ensure long-term stability.

Regarding the market and customers, it is desirable to use Customer relationship management (CRM) to track and enhance customer interactions, expand the product range, and stay informed of industry trends and technological advancements to remain competitive. Staying agile and responsive, diversifying market presence, and exploring new geographical regions can help reduce dependency on a single market.

5.2 Unique Selling Proposition (USP)

The Unique Selling Proposition (USP) is vital to any business strategy that differentiates a company or product from its competitors. It highlights what makes the product or service unique, defining its value to the customer that others cannot. A strong USP helps businesses attract and retain customers by showcasing their distinctive quality, sustainability, innovation, or expertise advantages. It is a core identity that shapes marketing efforts and informs decision-making across all business functions. In highly competitive sectors like agriculture and seed production, having a clear and compelling USP is crucial for establishing market leadership, enhancing brand loyalty, and achieving long-term success.
Based on the Unique Selling Propositions (USPs) presented for different sectors within seed production, each has its distinct focus, aligning with the specific needs and priorities of its market segment.

Seed Production

For the general Seed Production category, the USP focuses on organic seed varieties, particularly on local heritage and sustainable practices. This approach positions the business as a guardian of traditional agricultural knowledge while meeting the modern demand for organic options. By focusing on local heritage, the organisation appeals to customers who value preserving and managing biodiversity and organic farming. This USP is crucial in a market increasingly driven by environmental concerns and the shift toward sustainable agricultural solutions.

Cultivar Testing

The USP of Cultivar Testing is centred around a unique cultivar evaluation method supported by extensive data analysis. This focus on advanced, data-driven evaluation processes allows the organisation to offer precise and reliable insights into the performance of different seed cultivars, which is invaluable for organic agricultural companies and researchers. By ensuring that seeds are tested under various environmental and soil conditions, this USP highlights the organisation's role as a scientific leader in seed testing, providing critical data that drives innovation and helps improve crop production in specific locations and conditions. This technical expertise and data-backed approach make the organisation indispensable to stakeholders aiming to optimise their agricultural outcomes.

Research Centre

For the Research Centre, the USP revolves around its long-standing expertise and leadership in agricultural research, particularly in developing and evaluating cultivars tailored to organic farming practices. This USP positions the research centre as a pioneer in developing new seed varieties that align with global needs toward sustainability. The centre's innovation leadership and ability to produce cultivars designed explicitly for organic farming gives it a distinct advantage in a market increasingly oriented toward environmental responsibility and the future of agriculture.

Company

The Company takes a more multifaceted approach to its USP, emphasising effective management, innovation and placing a focus on profitability. The company's ability to specialise in organic high-quality seed production, combined with its commitment to innovation, gives it a competitive edge. The company's USP also includes its breeding program and testing stations, . This strategic advantage ensures the company remains competitive while focusing on sustainability, production efficiency, and growth.

Initiative

For the Initiative, the USP is its expertise in preserving and promoting local plant diversity, achieved through strong regional partnerships and biodiversity-focused agricultural practices. This aligns with global efforts to combat the loss of biodiversity in agriculture, making it particularly relevant in a world where climate change and monocultures threaten the agri-food system stability. The initiative supports local economies and aligns with sustainable development goals by emphasising strong regional collaboration. This USP appeals to stakeholders focused on sustainability and those who support organic agricultural initiatives rooted in environmental and regional resilience.

Arable Seed Producers

The Arable Seed Producers stand out for their unique cultivar evaluation expertise, extensive experience, and strong farmer networks. The strong relationship with the agricultural community underscores the trust and credibility built over time, positioning this organisation as a leader in seed testing and farmer support. By leveraging both practical experience and technical knowledge, this USP offers value to farmers who seek organic, reliable, high-performing seeds that are thoroughly evaluated and tailored to their specific farming needs.

Vegetable Seed Producers

The Vegetable Seed Producers focus on offering professional organic seeds of unique varieties while maintaining a solid commitment to preserving biodiversity. By positioning themselves as the only organic provider of such unique varieties in their area, they create a niche market that ensures customer loyalty and highlights their exclusivity. This focus on biodiversity aligns with the growing demand for speciality products that meet consumer and environmental expectations, making it a strong selling point for producers prioritising long-term sustainability.

Organic Production

For Organic Production, the USP emphasises 100% organic, high-quality seeds with good germination rates, which speaks directly to the market's demand for reliability in organic farming inputs. By focusing on germination rates, the organisation reassures customers that their seeds will perform well under organic farming conditions, where synthetic inputs are not forbidden. This assurance of quality is critical for farmers who rely on organic certifications and need to ensure the viability of their crops, making this USP highly effective in building trust within the organic farming community.

Organic & Conventional Production

The USP for Organic & Conventional Production highlights the organisation's role as a leading company with an strategy to mitigate negative market impacts . This ability to be flexible and cater to both conventional and organic markets gives the company a unique advantage, as it can it can easily adapt to the gradual growth of the organic seed market. By being adaptable, the company appeals to a broader customer base, including conventional and organic farmers . This dual-market approach positions the company as a versatile leader in the seed production industry, able to meet diverse agricultural context.

	SEED PRODUCTION	CULTIVAR TESTING	RESEARCH CENTER	COMPANY	
UNIQUE SELLING PROPOSITION	· a unique focus on organic seed varieties · emphasizing local heritage and sustainable practices	· unique cultivar evaluation method and extensive data analysis	· long- standing expertise and leadership in agricultural research, especially in the development and evaluation of cultivars tailored organic farming practices	· S - effective management, only project of its kind · M - commitment to innovation and sustainable development through specialization in organic · L - world's leading comapnies, own breeding program and testing stations	

	INITIATIVE	ARABLE	VEGETABLE SEED PRODUCERS	ORGANIC PRODUCTION	ORGANIC & CONVENTIONAL PRODUCTION
UNIQUE SELLING PROPOSITION	· expertise in preserving and promoting local plant diversity through strong regional partnership and innovative, biodiversity-focused agricultural practices	· unique cultivar evaluation, extensive experience and strong farmer network	· offering professional seeds of unique varieties while perserving biodiversity an being the only one in the area	· 100% organic high-quality seeds with good germination rates	· leading company with an strategy to mitigate negative market impacts · by beeing adaptable, the company appeals to broader customer base, including conventional and organic farmers

Figure 42 Overview of USP per typology

6. References

- Boschiero, Martina, Valeria De Laurentiis, Carla Caldeira, and Serenella Sala. "Comparison of organic and conventional cropping systems: A systematic review of life cycle assessment studies." *Environmental Impact Assessment Review* 102 (2023): 107187.
- Directorate-General for Agriculture and Rural Development. "Organic farming in the EU. A decade of organic growth." European commission (2023) EU Agricultural Economic briefs
- Döring, T., Bocci, R., Hitchings, R., Howlett, S., Lammerts van Bueren, E., Pautasso, M., . . . Wolfe, M. (2012). The Organic Seed Regulations Framework in Europe-Current Status and Recommendations for Future. *Org. Agric*, 173–183.
- Döring, Thomas F., Riccardo Bocci, Roger Hitchings, Sally Howlett, Edith T. Lammerts van Bueren, Marco Pautasso, Maaike Raaijmakers et al. "The organic seed regulations framework in Europe—current status and recommendations for future development." *Organic agriculture* 2 (2012): 173-183.
- Orsini, S., Costanzo, A., Solfanelli, F., Zanoli, R., Padel, S., Messmer, M.M., Winter, E., & Schaefer, F. (2020). Factors Affecting the Use of Organic Seed by Organic Farmers in Europe. *Sustainability, 12*, 8540.
- Pânzaru, Radu Lucian, Daniela Firoiu, George H. Ionescu, Andi Ciobanu, Dragoș Mihai Medelete, and Ramona Pîrvu. 2023. "Organic Agriculture in the Context of 2030 Agenda Implementation in European Union Countries" *Sustainability* 15, no. 13: 10582. https://doi.org/10.3390/su151310582
- Solfanelli, F.; Ozturk, E.; Dudinskaya, E.C.; Mandolesi, S.; Orsini, S.; Messmer, M.; Naspetti, S.; Schaefer, F.; Winter, E.; Zanoli, R. Estimating Supply and Demand of Organic Seeds in Europe Using Survey Data and MI Techniques. *Sustainability* 2022, *14*, 10761. https://doi.org/10.3390/su141710761
- Solfanelli, Francesco, Emel Ozturk, Emilia Cubero Dudinskaya, Serena Mandolesi, Stefano Orsini, Monika Messmer, Simona Naspetti, Freya Schaefer, Eva Winter, and Raffaele Zanoli. 2022. "Estimating Supply and Demand of Organic Seeds in Europe Using Survey Data and MI Techniques" *Sustainability* 14, no. 17: 10761. https://doi.org/10.3390/su141710761
- Willer, H., Schlatter, B., Travnicek, J., Kemper, L., Lernoud, J. "The World of Organic Agriculture. Statistics and Emerging Trends 2020". Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn. January 28, 2020. Accessed June 10, 2024. https://orgprints.org/id/eprint/37222/9/willer-et-al-2020-full-document-2020-02-28-4th-corrigenda.pdf
- Willer, Helga Jan Trávníček and Bernhard Schlatter (Eds.) (2024): The World of Organic Agriculture. Statistics and Emerging Trends 2024. Research Institute of Organic Agriculture FiBL, Frick, and IFOAM – Organics International, Bonn.

Annex 1 SWOT interview concept for organic seed producers

Overview of SWOT interview concept for T5.1.

GENERAL PROFILING	20’

Tell us a bit about your business.
How did you secure initial funding? Subsidy schemes?
Type of production nowadays? Ratio of organic/conventional seed production/plant breeding?
When did you start with organic seed production/plant breeding?
Insight in the past 3-5 years (investments, turnover, scope of production etc.)?
Plans for the upcoming 3-5 years?
What is your Unique Selling Proposition (USP)?
(Qualified) workforce? How many people do you employ?
Current professional relationship model (suppliers, retailers, customers)?
General feedback on the business's profitability (CAPEX, OPEX)?
Do you have a business plan/model nowadays? Are you updating it regularly?
Approach to R&D? Participation in projects/ interest in participation?
The difference between organic and conventional production? How are you covering additional costs of organic seed production?

STRENGTHS	WEAKNESSES
20'	20'

RESOURCES/ PRODUCTION

The situation in organic and conventional agriculture differs in the sense of production, resources, but also knowledge required. We'd like to know more about these segments and that you perceive as a strength of your organisation…

- capabilities
- experience, knowledge and, datasets
- resources, assets, and people
- processes, systems

USP & MARKETING

Unique selling propositions and marketing are important factors for successful market reach, price forming and development of long-term business relationships. Tell us a bit more about…

- competitive advantage
- price, value and quality
- innovative aspects/IT/digitalisation
- marketing
- communication strategy

MARKET & SALES

Next to the production, seed producers/plant breeders must also play the role of agro-managers who detect market opportunities and can analyse sales strategies and channels on a national and international level.

- target market (national, international)
- most successful selling channel
- top sales strategies
- location, geographical

BUSINESS PLANNING

The transition to organic production is a complicated, time-consuming, and financially demanding process which comes with numerous OPEX and CAPEX costs. To avoid financial risks, strategies and planning processes are recommended. At the moment, do you have/use…

- presence of business plans/models
- financial reserves, returns
- subsidy schemes – using currently?
- strategy for scaling up

RESOURCES/PRODUCTION

Organic seed production and plant breeding requires more effort in comparison to conventional, more checks and certificates as well as different infrastructure is required. What presents the biggest weaknesses of your production and/or process…

- missing capabilities
- supply chain
- management cover
- equipment?
- infrastructure?
- area availability?
- biggest production / business bottlenecks?
- continuity of production
- certification (cost, procedure etc.)

MARKET

Nowadays, it is difficult to break into the market, as consumers request a lot of information and each detail for products placing is important

- gaps in competitive strengths
- reputation, presence, and reach

FINANCES

Financial framework is an extremely important segment of each production. Which of these present the biggest weakness / obstacle for your production process?

- reliability of data, plan, and project financials
- cash flow, cash drain
- lack of business planning/modelling
- subsidy schemes

OPPORTUNITIES	THREATS
20′	20′

MARKET

Nowadays, there is a growing demand of organic products and consequently organic seed... It is of great importance to determine the target market, trends, demand, and import/export. Where do you see opportunities concerning...

- target markets
- market developments and trends
- geographical import/export
- consumer demand?

TECHNOLOGY

There is a difference in the technologies applied in the organic seed production / plant breeding / cultivar testing. Which technologies/innovations you plan to implement in the upcoming year(s) and why?

- innovation and technology development

BUSINESS PLANNING

How much importance do you put on business planning process? Which opportunities on the market do you see in the upcoming 2-5 years?

- business development
- major contracts, tactics
- subsidy schemes (needs)

POLICY FRAMEWORK

Which segments of policy framework do you perceive as an opportunistic?

- regulatory framework?

NETWORKING

There are a small number of organic seed producers compared to conventional production. Would you find partnerships helpful for increasing market competitiveness?

- partnerships?

MARKET

The market is changing rapidly, and different geopolitical situations (war in Ukraine, COVID-19) also brought a lot of difficulties to the agricultural and food sectors. Which of these would you pinpoint as the most challenging for the future period?

- market demand
- competitors?
- workforce
- loss of resources

TECHNOLOGY

Due to increasing climate changes and temperature differences, innovation in technologies must keep up with those changes and adapt to them. Do you think that there is a sufficient number and quality of technologies that support avoiding risks related to climate changes?

- innovation in technologies, services
- environmental effects/climate

ECONOMICS & BUSINESS PLANNING

Which of the following segments would you pinpoint as the most important and least supported by relevant institutions?

- economic effects
- poor management strategies
- new contracts and partners
- other obstacles to be faced

POLICY FRAMEWORK

Considering an ever-changing policy environment, which of the political and legislative segments have the biggest negative impact on this sector...

- political effects
- legislative effects

Annex 2 SWOT interview concept for cultivar evaluation networks

Overview of SWOT interview concept for T5.1 adapted for cultivar evaluation networks

GENERAL PROFILING

Tell us a bit about your initiative/organisation.
Are you:

- A public organisation
- A private commercial organisation
- A non-profit organisation (association, etc.)

What is your main overall activity?

- Agricultural production/marketing
- Seed production/marketing/breeding
- Research
- Development/advisory
- Public policies
- other (specify)

Describe the cultivar testing activity you are involved with; your role within it (coordination, consultancy, assessments, data analysis, dissemination, register…); who else is involved (farmers and how many, other experimental stations, other organisations, etc…) What about your cultivar evaluation activity? When did it start? Who took the initiative?
Which type of cultivars are you testing?

- conventionally bred cultivars (propagated under certified organic conditions)
- organically bred cultivars (breeding and propagation under certified organic conditions)
- conservation and/ or amateur varieties (conservation variety = landrace or variety threatened by genetic erosion; amateur variety = with no intrinsic value for commercial crop production)
- Organic Heterogeneous Material
- local or traditional cultivars
- cultivars coming from participatory or farmers´ plant breeding
- cultivars developed by seed companies under PBR
- cultivars developed by seed companies without PBR

How did you secure initial funding for the cultivar testing activity you are conducting? Subsidy schemes?

How do you finance the cultivar evaluation activity? (multiple answers possible, try to extract more details for each possible funding model)

- public funding
- private funding
- local, regional, national, EU
- fee from members
- Breeders fee
- supply chain funding
- selling the information

Are you publishing the information in full open access?

Are you testing cultivars in organic or conventional production? Ratio?

Insight in the past 3-5 years (investments, turnover, scope of production etc. and/or financial stability, constraints, opportunities) of your overall activity?

Plans for the upcoming 3-5 years about your cultivar testing activity?

What is your Unique Selling Proposition (USP) about your cultivar testing activity? (example: providing recommendations to farmers / seed producers / processors dedicated on organic farming...)? What gap is your activity filling? Who are the main target groups of your activity?

Current professional relationship model (suppliers, retailers, customers)? Describe a little bit your relationship with the value chain? (farmers, seed enterprises, breeders, etc.)

How do you track your work? How did you organize your activities from the financial side? Do you have a council/board within the initiative that makes business decisions and plans, including cultivar testing activities? Do you have any problems with funding and setting up the testing activities?

Approach to R&D? Participation in projects/ interest in participation?