CANADIAN AGRICULTURAL PARTNERSHIP

ORGANIC EXTENSION NEEDS ASSESSMENT

PHASE 1 & 2 REPORT

Prepared by:

The Institute for Sustainable Food Systems
at Kwantlen Polytechnic University

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The Institute for Sustainable Food Systems (ISFS) is an applied research and extension unit at Kwantlen Polytechnic University (KPU) that investigates and supports sustainable agriculture and regional food systems as key elements of sustainable communities. We focus predominantly on British Columbia but also extend our programming to other regions. Our applied research focuses on the potential of regional food systems in terms of agriculture and food, economics, community health, policy, and environmental integrity. Our extension programming provides information and support for farmers, communities, business, policy makers, and others. Community collaboration is central to our approach. www.kpu.ca/isfs

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Disclaimer

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Statement from the Ministry of Agriculture, Food, and Fisheries on Organic Extension in BC

The Ministry thanks KPU for their work conducting an Extension Needs Assessment for the organic sector in B.C. The report(s) contain valuable information pertaining to the needs and current extension supports serving the organic and diversified farming sector in B.C. The Ministry of Agriculture, Food, and Fisheries wants to ensure an integrated approach to extension that includes all sectors and commodities, and we will incorporate the information contained in this report into broader strategies and plans going forward.

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EXECUTIVE SUMMARY

The purpose of the Organic Extension Project was to further elucidate and confirm the need for the creation of a province wide extension service to provide relevant and high quality research and informal education to support, advance, and expand BC's organic agriculture and food system sector. Effective extension strategically integrates applied research, information, tool and methods disseminations, and adoption programming. The desired outcome for this project is to enhance awareness of organic production practices in BC to increase the organic sector's profitability and long-term sustainability.

This report presents the results of the following activities:

- Assessment of extension needs in BC's organic sector through sector surveys and interviews, and a scan of existing organic 'extension' in BC.
- Scan of extension services in other jurisdictions to identify organization, governance and delivery options that could be utilized to meet sector needs.
- Identification of gaps and opportunities related to organic extension services in BC.

Our final report on April 30th will present our recommendations for the configuration, staffing, operation, administration and financing of a province wide organic extension service. In it we will identify opportunities that are strategic, informed, objective, and can be effectively integrated with existing resources and programs available through BC Ministry of Agriculture, Food and Fisheries (AFF), BC universities, not-for-profit organizations, et al.

KEY FINDINGS

Sector challenges: The organic sector is an extremely diverse encompassing numerous sub-sectors (e.g. vegetable, fruit, livestock, poultry, dairy, processing, marketing and sales), combined with the diversity of agriculture environments across the different bioregions in BC. An effective extension service must address a range of technical, regulatory, and business challenges if it is to support the continued viability and growth of the sector. Certified organic producers and processors have specific challenges pertaining to certification, organic standards, sourcing organic inputs, soil and crop fertility, and pest management strategies among others. Regionally specific information and support is important, and regions outside of more populated areas feel underserved.

Gap in services: There is a particular lack of organic-specific applied research and extension. Available extension resources are limited, and what exists is predominantly geared towards conventional agriculture information and solutions.

Lack of awareness: Farmers are not always sure what supports or services are available. Survey and interview findings indicate that individual producers vary in awareness of what resources exist, how to access them, and how they can benefit from extension. This indicates a lack of awareness about available services, in addition to the actual lack of extension services.

Lack of coordination: Existing organic extension resources are disconnected, piecemeal, replicated. Organic extension actors lack coordination, a shared long term vision, and sufficient funding to deliver effective levels of support.

Possibilities: A scan of organic extension in other jurisdictions illustrates possibilities for ambitious and strategic organic extension policy and programs. Successful extension requires significant investment from public and private sectors to meet extension demand and transform our agriculture and food system to become more sustainable and resilient.

SUMMARY OF RECOMMENDATIONS

Governance:

- Have a long-term strategy collaboratively developed between AFF, Organic BC, key universities, and other sector stakeholders.
- Advocate for public funding commitment.
- Develop a sector extension funding commitment/mechanism.

Sector participation:

- Include sector representatives in governance and program planning and development.
- Ensure participatory approaches (including farmer-to-farmer) in extension strategic planning and program design and delivery.

Service design:

- Establish an administrative body responsible for coordination of extension agenda, actors, and programs.
- Secure funding to hire additional dedicated extension personnel with general agriculture acumen and speciality areas matching organic sector needs (pest, soil, livestock, horticulture, business management) and to support existing university based extension, and extension programming.
- Ensure the extension service is accountable to a governing body (AFF and sector representatives) for performance and impact.
- Use technology for extension collaboration and delivery. Include extension communications platform (e.g. BC Food Web) as “one-stop shop” for organic extension resources. Ensure ongoing maintenance, curation.
- Make organic extension available to all (not limited to certified organic).
- Design extension programs to span the entire food system (not just production).
- Link organic extension to climate, sustainability, reconciliation initiatives.

We have outlined our proposed concept on pages 50-51 for an organic extension service dedicated to promoting widespread understanding and adoption of organic and regenerative practices throughout BC’s agriculture and food system.

The service will be structured as a collaborative of committed extension actors (individuals and organizations) offering coordinated organic extension services per a mutually conceived and shared agenda.

We will be working with the identified Management Team collaborators to develop recommendations for the following deliverables, which will be presented in the April 30th final project report.

1.0 INTRODUCTION

1.1 RATIONALE FOR ORGANIC EXTENSION

What is Extension ?

Extension is integrated, comprehensive, and strategic applied research, information transfer and communication, and knowledge/method/tool adoption programming. Sector and community development is the primary purpose of an extension service. Extension can address immediate (e.g. on farm soil fertility management) or long term (consumer support for organic farming and purchase of organic foods) challenges. It can focus on technical, social, environmental, economic, and other aspects of the food and agriculture sector.

Extension and applied research are closely linked. Applied research develops knowledge/methods/tools that are shared with the end user through extension knowledge transfer and adoption programming. Feedback from end users deepens understanding of food system challenges and helps develop improved knowledge/methods/tools. Thus effective extension constitutes a circular communication and action mechanism for sector advancement (Mullinix, 2019).

Extension uses 'informal education' methods, including, on-farm research and demonstration, technical publications/resources, workshops, conferences, seminars, short courses, field schools etc. These methods often employ a farmer-to-farmer approach, with support from extension professionals. Producers derive numerous benefits from participating in extension activities, including economic viability and improved farm income, productivity, and adoption of agri-environmental practices (Brennan et al., 2016; Cawley et al., 2015; Herrera et al., 2016; Løes et al., 2015; Tamini, 2011).

History

Modern forms of extension are thought to have originated from Europe, in particular Ireland during the potato famine in the 1850s, as well as traveling farm advisors in continental Europe. The term "extension" comes from the idea of extending or disseminating useful information from universities to the greater population (Jones & Garforth, 1997). The provision of public extension services has declined over time in Europe and North America (Laurent et al., 2006; Milburn et al., 2010) and extension has been relegated to the private sector and market forces. Extension in Canada is a provincial responsibility but has historically received federal funds, and until the 1980s was offered by provincial governments in contrast with the university-based cooperative extension model of the US (Barichello, 1995; Yeshewalul, 1982).

Extension for Organic Agriculture

Organic agriculture produces numerous public benefits including ecosystem services, rural development, public health, animal welfare, and food quality (International Federation of Organic Agriculture Movements [IFOAM], 2017; Reganold & Wachter, 2016). Public investment in research and extension is a powerful policy lever to support organic agriculture and address complex agri-environmental challenges (Delate et al., 2017; IFOAM 2017; Knuth et al., 2020; Standing Senate Committee on Agriculture and Forestry, 2018; United Nations Conference on Trade and Development [UNCTAD], 2008; Wheeler, 2011).

Public funding for research and extension in organic or sustainable agriculture has historically been quite low. In the US, research projects with emphasis on agroecology accounted for an estimated 0.6–1.5% of the 2014 United States Department of Agriculture (USDA) Research, Extension, and Economics budget (DeLonge,

Miles, & Carlisle, 2016). In the European Union, less than 1% of agriculture research and innovation funding was allocated to organic research projects in 2016-2017 (IFOAM, 2017). A common, historical criticism of organic agriculture is the lower yield or productivity compared to conventional agriculture. Recent evaluations reveal this not to be the case- organic agriculture yields are generally equivalent and offer numerous distinct advantages such as greater profitability and reduced energy use and carbon emissions (Rodale Institute, 2011). Greater investment in research and extension on organic best management practices would improve the performance of organic farming systems (Ponisio et al., 2015; Reganold & Wachter 2016; Seufert & Ramankutty, 2017).

1.2 EFFECTIVE EXTENSION

Our extension scan and analysis was heavily informed by the work of Birner et al. (2009) and Davis et al. (2020) on pluralistic agricultural extension systems. Globally, agricultural extension and advisory services have become more pluralistic. In pluralistic systems, no single entity provides extension, and public and private sector organizations are involved in funding and providing extension services.

The following 9 key policy recommendations to ensure efficacy and sustainability of extension (Davis et al. 2020) are reflected in our BC organic sector needs assessment findings and provide guidance for our recommendations. Each recommendation is illustrated by a case study from the global extension scan.

1. Explicit extension policy and strategy is required for effective governance, funding, coordination, and implementation of extension.

> **Case study:** Quebec is the only Canadian province with an explicit provincial strategy document for supporting the organic sector. The policy (Politique Bioalimentaire 2018-2025 - Fueling our world) sets a specific target of doubling the area under organic production in 2025 to reach 98,000 hectares and lays out financial supports to reach that goal, including 85% increase in financial assistance for management, technical and agro-environmental consulting services offered by Agriconseils networks to businesses starting up, those converting or those already dedicated to organic production.

2. Public funding for extension is critical for providing public goods and ensuring that extension services reach underserved groups and areas not served by private or market-oriented funding/ programming.

3. Coordination becomes more important as extension becomes more pluralistic (i.e. more providers involved) in order to identify gaps, reduce duplication, and ensure strategic focus and quality of programs and services

> **Case study:** Organic extension is integrated into the overall extension service for agriculture and forestry in the German state of Bavaria. The state Ministry of Food, Agriculture and Forestry funds and coordinates advisory services, research, and knowledge transfer. Farmers access government-run “organic specialist centres’’ as their single access point for free or low-cost services, including individualized advice. Technical production expertise is provided by industry NGOs, with most costs covered by government funding. Farmers pay very little.

4. Producers and producer organizations need support to better identify, prioritize, and link their needs to extension services.

Case study: Manitoba Beef and Forage Initiatives (MBFI) is a non-profit organization focused on research and innovation for the Manitoba beef and forage industry. MBFI beef and forage producer organizations sit on the board and research advisory committee. Producers directly submit project ideas through an online project intake process.

5. Monitoring and evaluation of extension performance must be strengthened.

6. Extension providers need ongoing training in technical, leadership, educational, and managerial skills.

Case study: Andalucia's agriculture ministry provides a free, universal, public service web platform for knowledge transfer through its public research arm. The platform provides online access to publications, technical bulletins, apps, and online courses, including a specialized 80-hour training course on organic agriculture for agricultural advisors.

7. Participatory decision-making to ensure extension moves away from top-down information sharing.

Case study: In England, Innovative Farmers is a non-profit network of farmers running on-farm trials with support from researchers. The network helps match farmers to other farmers and to a researcher who supports them with field trial design, coordination, and knowledge dissemination. On-farm projects are identified and initiated by farmer groups. Each group is assigned a researcher who helps design, monitor, analyze, and publicize results. The network provides each group with access to up to £10,000 for each field lab trial.

8. Leverage technologies to increase the reach of extension, connect with extension users about their needs, and improve access to real-time information about weather, markets, prices, etc.

Case study: Organic industry associations in the Netherlands established BioNext, a collaboratively structured NGO governed by representatives across the organic value chain. BioNext makes extensive use of online tools to share organic research results widely:

- BioKennis online research portal: users can access plain language resources as well as scientific articles
- BioAcademy platform for webinars and online courses: content offered by various consulting groups and educational businesses
- Bio-Beurs annual organic trade fair
- Calamity and crisis communication: BioNext established a coronavirus "hotline" to find out the main concerns of the organic sector regarding Covid-19. They also have coronavirus-specific newsletters
- BioNext Library for industry reports and trends
- BioBank member platform for organic farmers and businesses to advertise/buy/sell organic products to each other

9. Design extension to meet complex challenges (e.g. climate change) and bring about positive change towards a more resilient food system.

Case study: Organic extension in Switzerland is mainly provided by the Research Institute of Organic Agriculture (FiBL), a private non-profit research agency supported by public and private funds. FiBL's clear and bold vision aims to transform Switzerland's agri-food sector towards sustainability ("Our aim is to place organic farming, animal welfare and agroecology at the heart of the agri-food sector.") FiBL's services address 11 areas that span the entire food system from inputs to consumers.

2.0 METHODOLOGY

The overall intended benefit of this project is to provide recommendations to AFF for the creation of an organic extension service that will provide relevant and high quality research and informal education programming to support, advance, and expand BC's organic sector.

Project objectives:

- Complete an assessment of extension needs in BC's organic sector
- Assess available extension delivery options that meet sector needs
- Engage with stakeholders to identify gaps and opportunities related to organic extension support in BC
- Develop recommendations for organic extension opportunities that are strategic, objective, and can be integrated with existing resources and programs available through AFF, other academic institutions, and organizations in BC

Project activities:

- Scan of BC organic extension actors
- Scan of organic extension models in other jurisdictions
- Sector survey about priorities, challenges, and extension experiences
- Sector interviews about priorities, challenges, and extension experiences
- Ongoing sector and stakeholder engagement to identify collaborators and develop extension model concept

2.1 EXTENSION SCAN

The purpose of our extension scan was to:

- Identify current organic sector extension resources in BC as part of needs assessment
- Identify potential collaborators for a coordinated province-wide organic extension service
- Identify and assess potential extension delivery models for a coordinated province-wide organic extension service

BC extension scan: An initial list of BC organic extension providers was generated from ISFS networks and project advisory committee. Interviews were conducted to understand the current level of organic extension services available, and to generate a list of potential collaborators. Interviewees were asked to provide referrals of other extension providers that would be pertinent for the study (snowball sampling method). A list was generated of organizations that provide extension or extension-like services that are not directly relevant to the organic sector. Refer to Appendix D for interview questions and list of non-organic extension providers.

Canadian extension scan: Internet searches were conducted to identify extension programs in Canada, focusing on provincial level programs as a starting point. Information was gathered from extension provider websites using the best-fit approach. Organic extension services were highlighted if they exist. When dedicated organic extension services are not available, general agricultural extension services are highlighted instead.

Extension in other jurisdictions outside of Canada: Internet searches were conducted to identify organic sector extension programs in other jurisdictions. Information was gathered from extension provider websites and non-scholarly reports (IFOAM, 2014; IFOAM, 2017).

The "best fit approach" framework (Birner et al., 2009) was used to organize, present, and assess findings. The

best fit approach framework is designed for analyzing pluralistic agricultural advisory services[1], and examines key characteristics of extension services. The framework was adapted in the following way to organize and analyze results of the extension scan:

Governance Structures

- Service Provision: Who is responsible for coordination (if any) and direct service provision?
- Funding: Public, private, or a combination
- Level of decentralization: At what level of government (national/federal, provincial [or equivalent], local) does extension operate
- Partnerships that exist between actors

Capacity and Management

- Mission: Is organic agriculture central to the extension service mission?
- Capacity: Number of extension staff, available extension facilities

Methods

- Approaches and delivery methods employed by extension service

2.2 SECTOR SURVEY

An anonymous online survey was developed and administered using SurveyMonkey to obtain information about extension needs of farmers and food system businesses in BC that pertain to organic methods and principles, as well as their perceptions of, experiences with, and interest in extension services. The survey was open to organic-regenerative farmers and related food businesses, as well as to those that are not currently using organic methods but interested in learning about organic-regenerative agriculture and food production methods. The survey was promoted through various online channels: Organic BC mailing list, other mailing lists (e.g. Farm Folk City Folk, Capital Region Food and Agriculture Initiatives Roundtable (CRFAIR), BC Food Systems Network). The survey was also sent to Farmers Institutes, industry associations, and offices of First Nations communities to be shared through their networks. There were three variations of the questionnaires with slightly different questions depending on type of respondent (producer, post-production business, and producer with post-production operation). All included closed-ended and open-ended questions. The questionnaires are presented in Appendix A.

The survey received 298 responses. Participants could choose to skip survey questions so the actual response rate to each question varies. Almost 72% of respondents are agricultural primary producers, 16% are producer-processors, and 8% are involved in a post-production business. Just over half (54%) of producers who responded are small farm operators (under 10 acres). Just under half of respondents (49%) are certified organic or in transition to certification. 46% of respondents either use organic/regenerative practices, are

1 Pluralistic: "co-existence of a variety of institutional options that exist for financing and providing agricultural advisory services

Agricultural advisory services: Used interchangeably with extension by Birner et al (2009), referring to "the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills and technologies to improve their livelihoods and well-being".

interested in certification, or are interested in adopting organic practices. Just over half of respondents are from Vancouver Island/Coast or South Coast regions.

Survey data was downloaded and cleaned, and data from closed-ended questions were summarized using descriptive statistics (frequencies, percentages). Some cross-tabulations were conducted. For open-ended questions, themes were identified and coded using either Excel or Atlas.TI.

For open-ended question Q66 ("How would you envision a coordinated Organic Extension Service?") information from our literature review about extension models was used to identify potential analytical codes. For other open-ended questions, themes were drawn from participant responses rather than using pre-established codes.

2.3 SECTOR INTERVIEWS

In-depth interviews were conducted with 18 key actors in the organic-regenerative sector to re-affirm and further assess the organic sector's extension needs, and inform the development of a coordinated and strategic organic extension service. Participants included certified organic farmers as well as representatives from processors, retailers, certification bodies, organic inspectors, and Organic BC. Interviewees were asked about sector challenges and priorities, and their awareness and assessment of current extension services.

Recorded interview audio was transcribed using Sonix online transcription service, and coded to identify themes using ATLAS.ti qualitative data analysis software.

Refer to Appendix B for sector interview questionnaire.

2.4 SECTOR ENGAGEMENT

The following sector engagement activities were carried out:

- Formation of Project Advisory Committee, comprising representatives from industry, post-secondary, government and non-profit sectors. Advisors were engaged through committee meetings, individual conversations, and emails
- Appointment of official liaison between project team and Organic BC as key sector partner. Formation of Organic BC 3-person working group to engage in substantive program development deliberation
- Meetings with potential collaborators to ascertain interest and level of commitment, and gather feedback on initial concept. Meetings with confirmed collaborators to further develop operational recommendations
- Meetings with regional district governments to inform them about the project and gather feedback on the initial project concept

Refer to Appendix C for the list of organizations and individuals engaged.

3.0 EXTENSION ENVIRONMENTAL SCAN

3.1 EXTENSION IN BC

Various groups in the public and private sector provide extension or extension-like services to BC's organic/ regenerative agriculture and food sector. There is no entity, program, or policy framework focused on strategic coordination of organic extension services across the province. Nearly all extension programming is soft-money (grant) funded. Both of these features limit their long-term impact and capacity and entities compete for monetary resources. Few organizations or services specifically serve the certified organic sector. A number of organizations focus on regenerative, sustainable, agro-ecological, diversified, and/or small scale farming, that align well with organic sector needs and organic principles.

Summary of analysis of BC extension scan using the best fit approach:

- Service provision: Numerous groups in the public and private sector provide extension to BC's organic sector. Farmer-to-farmer support is another important source of information.
- Coordination: No single entity is focused on strategic coordination of organic extension services across the province.
- Funding: Scan provided limited information about funding. A number of providers expressed the importance of consistent core operational funding in delivering impactful extension.
- Level of decentralization: Varies by extension provider. The use of webinars has allowed extension providers to reach producers outside of their usual geographic boundaries.
- Partnerships and collaborations: Examples of extension-related partnerships do exist but there is no strategic collaboration for extension across the province and across the sector.
- Mission: Few organizations or services specifically serve the certified organic sector. A number of organizations focus on regenerative, sustainable, agro-ecological, or small scale farming. There were strong opinions that an organic extension service should serve all farmers, with the goal of moving BC agriculture towards more organic, regenerative, and sustainable practices.
- Capacity: There was general agreement from interviewees that more extension capacity is needed.
- Approaches: Available extension services include top-down (e.g. tech transfer) and bottom-up approaches (e.g. farmer-driven).
- Delivery methods: Various, including conferences, field days, demonstrations, mentorship, advising, presentations, workshops, online resources, etc.

3.2 ANALYSIS: SCAN OF ORGANIC EXTENSION IN BC

Governance

Service Provision: Survey results indicate that there are numerous groups in the public and private sector involved in providing 'extension' services in BC. Survey and interview results confirm that farmers sharing information with other farmers, either through informal relationships or through more formal mechanisms (e.g. farmers institutes, mentorship programs, at conferences and workshops), is an important and valued source of knowledge dissemination for the organic sector.

The following are summaries of the groups involved in direct provision of extension services to the organic sector:

Organic BC used to have an organic extension agent from 2007 to 2010. The individual who filled that position still gets questions from farmers even though they have not been in the position for a decade. A number of farmers interviewed for this study spoke about the positive impact of that organic extension agent position. Current extension services provided by Organic BC are the annual conference which they organize. Various organizations are involved in the program. The office also fields inquiries from members but has limited capacity to respond to all questions and often relies on volunteers from their board to do so. The organization also publishes the BC Organic Grower quarterly magazine to all certified organic members and stakeholders.

Questions regarding the certification process are directed by Organic BC to certification bodies (CBs). CBs used to play a bigger role in extension before rules were put in place to limit their role in providing consulting services in order to alleviate the conflict of interest that is inherent in certification. Some CBs offer the following extension-like services to their members:

- Grower meetings: BC Association for Regenerative Agriculture (BCARA), Fraser Valley Organic Producers Association (FVOPA), Islands Organic Producers Association (IOPA), North Okanagan Organic Association (NOOA)
- Educational seminars: IOPA, NOOA
- Farm tours: IOPA, NOOA
- Mentoring: IOPA, NOOA

The *BC Ministry of Agriculture, Food and Fisheries* Sector Development Branch has one Organic Specialist position whose main activities include connecting industry with resources and organizing/supporting education and knowledge transfer. The specialist receives inquiries directly from members of the sector, or through AgriService BC. Some survey respondents also cited Regional Agrologists as a source of extension. Regional Agrologists lead front line ministry initiatives in their specific region, and they work in collaboration with industry specialists including the organic specialist. There are 14 Regional Agrologists across 12 AGRI offices in BC. Ministry staff play a major role in planning the annual Horticultural Growers' Short Course, where one of the three days has events focused on the organic sector.

Young Agrarians is a farmer-to farmer educational resource network for new and young ecological, organic and regenerative farmers. Their BC chapter offers a land matching program, a farmer-to-farmer mentorship program focused on business skills, on- and off-farm educational and social events, and a website that aggregates agriculture-related resources and opportunities.

Other agriculture and food non-profit organizations also offer activities that support farmers with accessing information or networking with other farmers where it fits with their core mandate. Many of these organizations operate at local/regional scale. Examples include, but are not limited to:

- Northern Environmental Action Team's Northern Co-Hort in the Peace Region
- South Okanagan Similkameen Conservation Program (SOSCP)'s Sustainable Agriculture Program
- Langley Environmental Partners Society (LEPS)
- Society Promoting Environmental Conservation (SPEC) in Metro Vancouver
- Senden Sustainable Agriculture Resource Centre in Hazelton
- Bella Coola Valley Sustainable Agricultural Society

Private consultants may work directly with an individual producer, or they may be contracted and funded by government, industry groups, or non-profit groups to deliver services to a particular group or region. Certifying bodies commonly have a list of consultants they can refer their members to. There does not seem to be a single listing of private agriculture/food consultants focused on the organic sector in BC.

One interesting public-private model is Kootenay Boundary Farm Advisors (KBFA), which is an advisory service funded by three regional districts and the Columbia Basin Trust and delivered by a consulting firm to provide free or low-cost extension to producers in the Kootenay Boundary region. KBFA has two core staff, and they also contract out additional services to expert advisors from the public and private sector. KBFA is not organic-specific but they estimate about 30% of their clients are organic producers, and they have a number of organic-focused consultants on their advisor team.

Universities-Academia are involved in applied research and depending on the project, they may carry out extension activities. A number of university representatives interviewed for this study expressed interest in a coordinated extension service.

Coordination: There is no single body focused on strategic coordination of organic extension services across the province. Both Organic BC and the Organic Specialist work on strategic sector-wide initiatives but extension is not their central mission.

> "I was really happy to hear of this initiative because I feel like some of the things we wanted to accomplish would be wonderful If we can work together with everyone in the province and get similar things happening. You know, we don't have that. It doesn't have to be the Interior. We all have different micro sites and unique things to each region. If we could do it on a larger provincial scale, I think it would even be more powerful. And so I'm really excited to be participating in this project." – Extension provider, post-secondary

Funding: There was no interview question specifically about the funding sources for extension programs. A number of interviewees indicated that their organizational or program is soft-funded with uncertainty of whether programs can continue beyond the funding term. A number of interviewees expressed the importance of consistent core operational funding in delivering impactful extension.

> Interviewer: "What do you think is missing in terms of support or resources?"
>
> Participant: "I guess just more extension, have a full time person, not on the grant cycle trying to get another year or two of funding to cobble something together. Have somebody who's a dedicated person at an institution or affiliated with an institution who is able to really put in the time to do a good job of giving them access to information." – Extension provider, NGO

Level of decentralization/geographic scope: Provincial and regional/local depending on the organization. One outcome of the COVID-19 pandemic was the increased offering of webinars to replace in-person events. According to some extension providers, the use of webinars allows them to reach producers outside of their usual geographic boundaries.

Partnerships and collaborations: Examples of extension-related partnerships do exist but there is no strategic collaboration for extension across the province and across the sector.

- The annual Horticultural Growers' Short Course is organized by the Lower Mainland Horticultural Improvement Association in partnership with AFF staff
- BC Food Web is a freely-accessible online portal designed to increase access to food systems research results and other resources for producers, processors, policy-makers, educators, and the general public. It is hosted by the University of British Columbia Centre for Sustainable Food Systems (UBC CSFS) and was developed collaboratively by UBC, KPU, University of the Fraser Valley (UFV), Farm Folk City Folk,

Organic BC, BC Agricultural Climate Adaptation Research Network (ACARN), Metro Vancouver, Investment Agriculture Foundation (IAF), and AFF. It is not organic-specific.

"Whatever programming that we put in place has to put government in partnership, between government, academic, and industry whether it's government providing the funding, with academics providing the leadership on the demonstration and the research, and industry leading the extension." – Extension provider, post-secondary

"Those collaborations were successful because we had key ministry people who were able to act as the liaison to the various commodity groups and industry specialists and others, and call those people together to really come up with a united plan that was pan-industry. And I think that we need to have that focus still in there. And it always destroys my confidence when the Ministry says we want to pull people out of the field or these specialist positions. Because I do really think that those positions are very important for communication, for collaboration and drawing industry in and being the anchor for a lot of those projects." – Extension provider, private consultant

Capacity and Management

Mission: Few organizations or services (besides Organic BC and private consultants) exclusively serve the certified organic sector. There are a number of organizations focused on organic as well as regenerative, sustainable, agro-ecological, or small scale farming, that align well with organic sector needs and organic principles. Other organizations focus on promoting environmental stewardship in agriculture without a focus on organic. The private consultancies that were interviewed offer both organic and non-organic services.

- Organic-exclusive: Organic BC, Organic Specialist, certifying bodies, organic inspectors who offer consulting.
- Organic-aligned, i.e. sustainable, regenerative, ecological: Young Agrarians, UBC CSFS, KPU ISFS and Sustainable Agriculture program, Thompson Rivers University (TRU) Applied Sustainable Ranching Program, Farm Folk City Folk
- Environmental stewardship focus: ARDCorp, BC Climate Action Initiative, regional NGOs (LEPS, SPEC, SOSCP)
- General extension support: Ministry regional agrologists and industry specialists, University of Northern British Columbia (UNBC) part-time extension specialist, Agriculture and Agri-Food Canada

There were strong opinions from extension provider interviewees and from project advisory committee about ensuring that an organic extension service should be able to serve all farmers, with the goal of moving BC agriculture towards more organic, regenerative, and sustainable practices.

"I think it would be great if the Ministry of Agriculture had increased extension support that had more people who were specializing in diversified and ecological production. I think it needs to be much broader than certified organic, in so far that people need to access alternative information. For example, water management systems like Keyline and working with natural lay of the land, and looking at water management along much broader terms, like multi farm, landscape level water planning." – Extension provider, NGO

Capacity: number of interviewees shared that they have limited capacity to respond to inquiries and requests for support from members of the organic sector. There was substantial agreement from interviewees that more extension capacity is needed in BC for the agricultural sector in general.

Interviewer: "Does [your organization] ever get calls from someone who's saying, hey, I need someone to help me with this and that?"

Participant: "All the time. And we don't have the capacity. The problem is we don't have anybody who's, because we don't have funding for that. We don't have an extension officer. And I would love to have one, but one is insufficient." – Extension provider, post-secondary

Interviewer: "If someone was to call your certification body and say, I'm thinking of getting certified, can you help me, who do you refer them to?"

Participant: "Really, they just go to current processors and producers in the area… And I think for the person calling, they could quickly perceive that this wasn't really something that the person on the other end of the phone had capacity for. So I feel like it just would fall through the cracks to be totally honest." – Certification body board member

Methods

Approaches:

In practice, available extension services and programs seem to combine top-down and bottom-up approaches (e.g. knowledge transfer through presentations of research that was developed in partnership with farmers). Many initiatives are industry- or farmer-driven.

- Knowledge dissemination and information access: Online resources, web portals, demonstrations, research presentations
- One-to-one information exchange and problem solving: Phone and email inquiries, consulting services
- Group learning: One-off events, farm schools, webinar series
- Participatory research: A common approach among the researchers interviewed where research priorities are identified with industry partners
- Farmer-to-farmer: Informal peer support, formal mentorship programs, newsletters

Delivery:

- Conferences
- Demonstrations, farm tours, field days
- In-person support, farm visits
- Mentorship
- One-on-one advising/consulting
- Website, online resources, listserv dissemination
- Presentations, research briefs, fact sheets, course materials
- Applied research, on-farm trials
- Workshops, seminars, webinars
- Short course

"And I do feel that the research and extension needs of that group [organic] are underrepresented. That is one reason why I'm pleased to talk to you this morning. I think that the current sort of procedures we have for funding and supporting the researchers that do research aren't really very effective at addressing the needs of these more marginal groups within the mainstream industry." – Extension provider, post-secondary

3.3 EXTENSION OUTSIDE BC

The "best fit approach" framework (Birner et al., 2009) was used to organize, present, and assess findings. The best fit approach framework is designed for analyzing pluralistic agricultural advisory services, and examines key characteristics of extension services, focusing on coordination, service provision, funding, mission, and capacity. Brief case studies of extension in other jurisdictions are provided below to illustrate.

The scan of organic extension in other jurisdictions illustrates possibilities for ambitious and strategic organic extension policy and programs. It also underscores the importance of significant investment from public and private sectors to meet extension demand and transform our agriculture and food system to become more sustainable and resilient.

Refer to Appendix E for detailed extension scan tables.

3.4 ANALYSIS: SCAN OF ORGANIC EXTENSION OUTSIDE BC

Coordination Models

The role of coordinator is to convene stakeholders and extension providers, facilitate collaboration and shared agenda-setting, and match extension services to demand. Extension scan shows that coordination may be provided by public, academic, industry, or other private sector actors.

Public sector:

- Bavaria, Germany: The state Ministry of Food, Agriculture and Forestry funds and coordinates advisory services, research, and knowledge transfer. Bavarian law requires collaboration between government and industry advisors in order to provide comprehensive advice to all farmers.
- Australia: Rural research and development corporations (RDCs) manage research, development, and innovation activities to support Australia's agriculture, fishing, and forestry industries. Five of 15 RDCs are Australian government-owned entities, and the remainder are industry-owned.

Sector or farmer groups:

- Netherlands: Organic sector groups created an industry-owned NGO (BioNext) that coordinates research and extension for the sector.
- France: Regional organic industry associations coordinate local farmers' extension groups. The national organic farmers' union coordinates regional groups at the national and international level.

Post secondary or other research institute:

- Switzerland: Private non-profit research institute (FiBL) coordinates extension in close collaboration with federal researchers and organic industry association.
- Denmark: International organic research institute (ICROFS) coordinates domestic and international research programs with input from industry, NGOs, and universities.
- USA: Regional offices for the Sustainable Agriculture Research and Education granting program are based out of host universities in four regions.

Service Delivery Models

In pluralistic extension systems, no single entity provides extension, and public and private sector organizations are involved in providing extension services. The coordinating agency is often also a direct provider of extension (e.g. Switzerland's FiBL, France's organic farmers' groups, Bavaria's state ministry of agriculture).

Government:

- Andalucia, Spain: Organic research and extension are shared between the regional government's agricultural research centre (IFAPA) and organic advisory service (ASEPEA).
- Bavaria, Germany: State organic specialist centres serve as farmers' access points for free or low-cost services, including individualized advice. Government advisors mainly address regulatory questions. Farmers with technical questions are referred to industry advisors.
- Switzerland: Cantons (the equivalent of Canada's provinces) offer some organic advisory services.

Sector or farmer groups:

- France: Organic farmers' groups organized at the local level provide technical, regulatory, or economic advice, organize training, and facilitate connections between producers and consumers. Regional and national organic farmers' groups also organize training and publications.
- Germany: Organic certification bodies have in-house staff responsible for addressing technical questions from their membership.
- England: The Soil Association is an organic charity that provides certification as well as extension services.
- Denmark: The national agriculture council owns and operates a research and innovation centre (SEGES) as a centralized source of resources and advice for all Danish farmers. SEGES has a dedicated organic team and organic-specific resources.

Other for-profit:

- Denmark: At the regional level, extension is provided by farmer-owned advisory companies (DLBR).

Post secondary or other research institute:

- Switzerland: Private non-profit research institute (FiBL) provides a range of organic research and extension services nationally and internationally.
- France: Institute of Organic Agriculture and Food (ITAB) is a private non–profit research organization with a state-designated mandate of applied research, technical assistance, and knowledge transfer for agriculture.
- Quebec: The National Institute of Organic Agriculture (INAB) provides organic research and knowledge transfer out of a post-secondary institution (Cégep de Victoriaville). INAB has two centres providing extension services, CETAB+ and CISA. CETAB+ conducts applied research and provides advisory services. CISA offers extension services to support social innovation.

Funding Models

Extension scan shows that funding tends to come from a combination of public and private sources (see Appendix E). Private sources of extension funding include direct contributions by industry associations, sector levies, fee-for-service, membership fees, charitable donations, and licensing fees.

The importance and impact of public funding for organic research and extension is illustrated by examples from European Union member states. The EU is an important public funder of organic research and extension in its member states and for trans-national organic projects. Organic agriculture is explicitly recognized in EU policy as a strategy for climate action and food system transformation. The EU Commission has recently set a goal of transitioning 25% of agricultural land in Europe under organic farming by 2030 (add citation).

Public-private funding arrangements:

- Denmark: The national agriculture council's research and innovation centre is mostly privately financed by industry fees and commercial activities. However, it also receives public funds for some programs

(e.g. organic conversion support program). Regional advisory companies are owned and financed by farmers.

- Switzerland: More than a quarter of FiBL Switzerland's revenues in 2017 came from federal contributions. The remainder are a combination of client fees, grants, and donations.
- Australia: Rural research and development corporations (RDCs) are funded by statutory industry levies matched with federal funds. Levies are collected by the federal department of agriculture. RDCs sign funding agreements with the government that include a performance and accountability framework.
- France: Local organic farmers' groups receive a combination of public funds, membership fees, contributions from organic industry groups, and charitable donations.
- England: A portion of profits from sales of the Waitrose Duchy Organics label supports organic research, extension, and innovation programs offered in partnership with industry associations in the UK. Funds for extension and innovation are also collected by industry through a statutory levy (not organic specific).

Mission

Extension services for organic agriculture can be conceptualized on a spectrum. At one end of the spectrum, organic extension is offered as the sole or primary extension service. This can be illustrated by the state of Sikkim, India which set a goal in 2003 of phasing out synthetic chemical farming inputs and achieving total adoption of organic practices.

The European jurisdictions highlighted in this extension scan fall in the middle of the spectrum where extension services dedicated to organic agriculture and food are offered in parallel to overall conventional agricultural extension. For example, organic extension is integrated into the greater agriculture extension service in Bavaria, Andalucia, and Denmark. Organic industry associations take on leadership roles in extension services in Denmark, France, and the Netherlands.

In Canada, Quebec is the only Canadian province with an explicit provincial strategy document for supporting the organic sector. Extension services for the agriculture sector are provided by government, academic, and private sector actors. The provincial government funds, coordinates, and directly provides some extension services, although available advising services (Agriconseils) is not organic-specific. Quebec's agriculture ministry has 18 regional organic advisors who provide information on the certification process, production techniques, and external resources and financial assistance available.

The Sustainable Agriculture Research and Education (SARE) program in the US and Ecological Farmers Association of Ontario (EFAO) are examples of extension providers that are not explicitly organic in their mission, but are strongly aligned with agro-ecological and sustainable agriculture approaches.

Capacity

Although jurisdictions in the extension scan vary in capacity, one common theme is having dedicated personnel for organic research and extension. The example of Bavaria is highlighted below to illustrate the significant level of public investment in extension capacity to meet an ambitious policy goal of expanding organic agriculture in the region.

Other measures of organic extension capacity are dedicated organic research and demonstration facilities (e.g. Switzerland, France, Quebec, England), continuing education for extension personnel about organic/sustainable agriculture (e.g. Andalucia, Bavaria, USA SARE program), and extension support for farmer-to-farmer programs (e.g. Bavaria, England, France).

Bavaria, Germany: Bavaria's state ministry of agriculture has invested significant capacity into organic research and extension to meet its ambitious policy goal of bringing 30% of its agricultural land under organic management by 2030 (current level in 2020 is 12%). All 9 state agricultural research institutes are involved in organic research projects. The state operates two technical schools and two "eco-academies" dedicated to organic education that offer formal and informal education programs for current and potential organic farmers. One technical school is focused on organic livestock and the other on organic horticulture. There are 5 regional organic specialist centres that coordinate with industry advisors to provide advising and training. The state also funds and coordinates a network of 100 long-term organic farms to promote farmer-to-farmer learning and facilitate mentorship of new organic farmers. In addition to research and extension, the state also provides subsidies for organic farmers and processors, funds an organic marketing campaign, and purchases organic food for state-owned cafeterias.

Methods (approaches/delivery)

Extension scan shows a range of extension approaches and delivery methods used to inform, train, and empower organic farmers. These are summarized in Table 1 below, organized by increasing focus on empowerment and community capacity building. Notable examples of community-based and farmer-to-farmer extension programs are highlighted in the bottom-right box, indicating the role and potential of extension in supporting and facilitating farmer-to-farmer learning.

Table 1. Extension approaches organized by increasing focus on empowerment and community capacity building. Adapted from Black 2000.

	Approach	Examples
As the problem or challenge being addressed by extension increases in complexity... ↓ ..Extension methods move towards empowerment of people and communities towards learning, experimentation, human development, and creativity.	Tech transfer Information access	Organic publications • Switzerland: BioAktuell magazine • BC: BC Organic Grower magazine • USA: Technical bulletins Online databases • Switzerland: organic seed database and permitted inputs list • Denmark: Open-access research archive • Netherlands: Organic industry reports
	Problem solving One-on-one exchange of information	Consulting • Denmark: Farmer-owned organic consulting firm • Andalucia: Government advisors provide advice to current and potential organic producers, including technical, production, and conversion topics
	Education Individual capacity building	Workshops and online courses for producers and extension providers • Andalucia: Online training platform includes 80-hour course on organic agriculture for agricultural advisors
	Community empowerment Capacity building	Supported farmer-to-farmer programs. • Bavaria: BioRegio network of 100 organic farms supporting farmer-to-farmer learning and mentorship. • England: Innovative Farmers network of farmer-led, researcher-supported trials • France: Local and regional organic farmer support groups

4.0 ORGANIC SECTOR CHALLENGES AND NEEDS

4.1 SUMMARY

The BC organic sector's specific research and extension needs have been conveyed in previous reports. BC's Organic Research Needs Survey (Eisen 2016) identified 18 different focus areas and research needs associated with each area. The Organic Horticulture Sector Regional Research Users Meeting (2018) identified expertise gaps in economics, varietal development and post-harvest research for organic horticulture. The need for an organic extension champion and more effective knowledge transfer was documented in both reports.

Summary of sector challenges and needs from sector survey and interviews:

- Sector challenges: The organic sector is an extremely diverse umbrella that encompasses all kinds of sub-sectors (e.g. vegetable, fruit, livestock), combined with the diversity of agriculture across the different bioregions in BC. Extension must address a range of technical, regulatory, and business challenges to support the continued growth and viability of the sector. Certified organic producers and processors have specific challenges pertaining to certification, organic standards, sourcing organic inputs, and organic pest management strategies among other challenges. Regionally specific information and support is important, and regions outside of more populated areas feel underserved.
- Gap in services: There is a lack of organic-specific applied research and extension. Available extension resources are limited, and what exists is predominantly geared towards conventional agriculture information and solutions.
- Lack of awareness: Farmers are not always sure what supports or services are available. Survey and interview findings indicate that individual producers vary in awareness of what resources exist, how to access them, and how they can benefit from extension. This indicates a lack of awareness about available services, in addition to the actual lack of extension services.
- Lack of coordination: Existing organic extension resources are disconnected, piecemeal, replicated. Organic extension actors lack coordination, shared long term vision and direction, and sufficient funding to deliver effective levels of support.

4.2 INDIVIDUAL PRIORITIES

Survey respondents were asked to describe their farm/business goals in an open ended question. Answers were then categorized into the following six themes.

- Profitability: Increase or improve profitability of their farm/business.
- Productivity and Operation Improvement: Improve farm/business performance in terms of yields, efficiency, quality.
- Growth: Expand various aspects of the farm/business e.g. buy more land, hire more staff, expand sales, find new markets.
- Social/Environmental Impact: Make a positive impact on community/environment.
- Personal or Entrepreneurial Goals: Achieve success as a farmer or entrepreneur, make a decent living from farming, achieve a good lifestyle.
- Exit from Farm/Business e.g. Find a successor, retire, sell the business, hand down to family or new business owner.

The top 3 themes in the farm/business goals of producers are Productivity and Operation Improvement, Social/Environmental Impact, and Growth.

The top 3 themes for post-production businesses are Growth, Productivity and Operation Improvement, and Social/Environmental Impact.

Survey respondents indicated that goals are interrelated. For example, increasing productivity will help improve profitability and allow a producer to pay a living wage to employees. Social/Environmental Impact is a broad category. Some respondents talked about sustainability as a general value rather than a specific objective. Other objectives include using sustainable growing methods; educating community; food security and access; and creating jobs. Growth is the top goal area for post-production businesses. It includes growth in supply of ingredients. 4% of post-production respondents have a goal of gaining or maintaining organic status.

4.3 ORGANIC SECTOR CHALLENGES

As anticipated, we received a range of responses regarding the main challenges facing the organic sector. It is extremely diverse encompassing a myriad of sub-sectors (e.g. vegetable, tree fruit, small fruit, diverse livestock, cut flowers), combined with the diversity of agriculture and socio-economic environments across the different bioregions in BC. Interviewees indicated the following main challenges faced by the organic sector as a whole:

Agronomic challenges:

- Organic-appropriate production information
- Organic arthropod, weed, and disease pest management
- Soil health and nutrient management
- Cultivar evaluation and selection
- Season extension and farm equipment
- Pasture management, hay and forage production
- Livestock health

Business management challenges:

- Business development
- Distribution and marketing

Regulatory challenges:

- Organic inputs
- Organic certification
- Food processing regulations

Other related challenges:

- Consumer demand
- Land access and affordability
- Labour availability and cost
- Farming in remote regions
- Access to certified organic slaughter facilities

Technical skills and information: Producers spoke about a variety of production-related issues that pose challenges for their operations. Pest management (insects, mites, weeds, diseases) is a challenge for both crop and livestock producers. Diagnosis and remedy of pest problems is not limited to the organic sector, but the approach or treatment must be compliant with organic standards. Other topics relating to animal agriculture are pasture management, hay and forage production, and stock health. Other topics relating to horticulture and field crops are cultivar selection, season extension options, and farm equipment. As the organic sector is quite diverse, so are the technical challenges and extension needs.

Business development: Respondents indicated the need for support to improve the profitability of their farm or business. Some respondents cited the enterprise budgets for smaller scale organic production that were developed by KPU as an example of useful business development resources, but need updating to stay relevant. Other needs include help with business planning, record keeping, scaling up to a more viable business, and how to access financing or grants.

Distribution and marketing: Producers in more rural or remote communities do not have access to the higher price premiums in urban markets like Vancouver. Support in exploring and developing distribution and marketing options, including cooperative models, would be valuable.

Challenges for food processors: "Extension" is not a term commonly used in this industry segment. Organic processors need organic ingredients, and they face a lack of supply and high costs. There is no industry association or organized community of organic food processing businesses in BC. The main supports seem to be the BC Food Processors Association, Small Scale Food Processors Association, and private consultants. Food processors must comply with numerous regulations (including food safety) that are not specific to certified organic operations. Food processing businesses that are smaller scale or in the start-up phase may have trouble accessing funding programs because they don't meet the minimum sales requirement (e.g. annual sales of $30,000).

Organic inputs: Organic farmers would like clarity on what inputs are permitted, and whether there is a permitted substances list. This is a common question to Organic BC and the AFF organic specialist. Organic BC refers these questions to the certifying bodies. Another part of the issue seems to be a lack of coordination among the parties involved (e.g. certifiers, Organic BC) in sharing the information that they do have. This results in farmers having to ask the question again and again, but the answers are not always made available. Another input related challenge is related to sourcing organic inputs and finding affordable options in their region.

Organic certification: In order to get organic certification, a producer or food business must familiarize themselves with organic standards first, which can be perceived as daunting and expensive. They must also become familiar with the process of organic inspections, audits, and recordkeeping. Producers and processors interested in transitioning to organic often seek support to go through the certification process, and are typically referred by certification bodies to private organic certification consultants who charge a range of fees.

Consumer demand: Producers would like to see greater understanding among the general public about what organic farming means, how organic food is produced, and what organic certification entails. Consumer education and awareness would help reduce misinformation, build support, and increase demand for BC-grown organic food.

New entrants: Mentorship is an important and valued new entrant professional development mechanism. Young Agrarians does not directly provide extension programs but does facilitate mentorship, which is grant funded (some from the provincial government). This is an area of potential collaboration within an organic extension service.

Livestock and poultry: In addition to organic livestock production-related challenges (pasture management, disease management and general husbandry), other challenges in the sector are related to accessing abattoir facilities that can do certified organic processing. There seems to be very limited access to suitable abattoirs, as there are few of them, and lots of demand for their services. Small scale livestock has distinct extension needs and challenges and it would be important to have extension personnel with organic livestock expertise as part of an organic extension service. In contrast, larger scale organic growers report that technical/production issues are less of a challenge, but they face significant pressure to sell products at a lower price, which cuts into their margins.

Fruit sector: Cawston/Keremeos is a hub for well-established organic tree fruit growers and is extensively served by private consultants. The more underserved demographics in this subsector are growers that are smaller scale, located outside of Cawston/Keremeos, or are newer to farming and potentially less experienced in horticulture.

Broader challenges: Respondents also shared challenges related to farmland affordability and access, labour availability and cost, and the challenges of farming in remote regions and more demanding climates.

Priority areas from survey

Per the survey, the top two areas producers and producer-processors want extension support for are soil health stewardship and pest management (Table 2). These results are further broken down by region (Table 4) and by product type (Table 5).

There were a smaller proportion of animal agriculture operations who responded to the survey and their needs are not well reflected in this list. Their responses to this question can be summarized as the need for access to small scale abattoirs or on-farm slaughter options.

Table 2. Top 10 areas where producers and producer processors (n=225) want support to achieve their goals

Area of support	% of respondents	Summary of open ended responses
1. Soil health stewardship	49.4%	Help with soil testing and interpretation, information and skill building about soil health, sustainable soil practices, improving soil fertility, soil building, nutrient management
2. Pest management (insects, mites, weeds, and diseases)	47.3%	Pest and disease identification, organic pest management options, organic weed management options, noxious weeds, local/regional information
3. Vegetable crop production	45.3%	Organic production info and access to expertise about specific crops, novel crops, seeds and varieties, diversifying by adding new crops

4. Post-harvest handling, storage, and distribution	35.8%	Increase efficiency of post-harvest and value add, improve shelf-life, systems and infrastructure for post-harvest and storage
5. Fruit and nut crop production	30.0%	Organic orchard management, soil health, pest management, nutrients, organic inputs, pruning, trellising, tree health; adoption of sustainable practices for vineyards and wineries
6. Water resources management	29.6%	Help with water testing and interpretation; sustainable water management practices
7. Whole farm operations	29.6%	Improve overall efficiency, lean principles, scaling up, strategic business decisions
8. Marketing and sales	29.2%	Developing scale-appropriate viable marketing strategies, including farmers market, CSA, organic wholesale, cooperative marketing and distribution
9. Farm machinery and equipment	24.3%	Equipment suited to small scale; season extension options, seed cleaning, equipment sharing options, loans or other financial support for equipment/infrastructure
10. Recordkeeping	21.8%	Systems and templates for tracking inputs (organic certification) and financials

Priority areas for processors

From the survey, the top area where processors want support to achieve their goals is in the ingredient supply chain (Table 3). Existing business supports for processors are not well-suited to smaller businesses. Part of the issue is around minimum revenue thresholds to qualify for supports. Processors want additional support with respect to required documentation, GAP protocols, access to funding, sourcing organic ingredients, equipment improvements, organic certification, and marketing.

Table 3. Top 10 areas where post-production businesses (n=23) want support to achieve their goals.

Area of support	% of respondents
1. Ingredient supply chain (e.g. sourcing organic ingredients, quality control, permitted additives)	47.8%
2. Food safety and certification	39.1%
3. Marketing and sales	39.1%
4. Distribution, storage, and handling	34.8%
5. Process innovations (e.g. developing new equipment/techniques/processes, improving existing equipment/techniques/processes)	30.4%
6. Post-production equipment	30.4%
7. Product innovations (e.g. developing new products, improving existing products)	26.1%
8. Quality control	26.1%
9. Recordkeeping	21.7%
10. Other (please specify)	17.4%

Table 4. Top 3 areas where producers and producer-processors want support, by region.

Vancouver Island/Coast (n=95)

1. Whole farm operations – 58%
2. Soil health stewardship – 43%
3. Vegetable crop production – 41%

South Coast (n=37)

1. Pest management (insects, mites, weeds, and diseases) – 60
2. Soil health stewardship – 57
3. Vegetable crop production – 49%

Cariboo-Chilcotin Coast (n=9)

1. Marketing and sales – 56%
2. Vegetable crop production – 44%
3. Post-harvest handling, storage, and distribution – 44%

Thompson Nicola (n=14)

1. Pest management (insects, mites, weeds, and diseases) – 57%
2. Vegetable crop production – 36%
3. Soil health stewardship – 36%

Okanagan (n=34)

1. Pest management (insects, mites, weeds, and diseases) – 62%
2. Soil health stewardship – 56%
3. Fruit and nut crop production – 38%

Kootenay (n=25)

1. Soil health stewardship – 60%
2. Pest management (insects, mites, weeds, and diseases) – 52%
3. Fruit and nut crop production – 48%

Omineca Skeena (n=8)

1. Vegetable crop production – 63%
2. Soil health stewardship – 38%
3. Marketing and sales – 38%

Peace (n=4)

1. Soil health stewardship - 50%
2. Food safety and certification - 50%
3. Vegetable crop production - 25%

Table 5. Top 3 areas where producers and producer-processors want support, by farm product.

Beef (n=22)

1. Slaughter and handling of animal products - 46%
2. Livestock production - 32%
3. Whole farm operations - 32%

Dairy (n=12)

1. Other - 50%
2. Whole farm operations - 25%
3. Financial management - 25%

Hog (n=15)

1. Slaughter and handling of animal products - 67%
2. Vegetable crop production - 59%
3. Soil health stewardship - 58%

Poultry and egg (n=46)

1. Soil health stewardship - 57%
2. Vegetable crop production - 52%
3. Pest management (insects, mites, weeds, and diseases) -50%

Sheep and goat (n=27)

1. Vegetable crop production - 41%
2. Slaughter and handling of animal products – 41%
3. Soil health stewardship - 37%

Oilseed and grain (n=8)

1. Soil health stewardship - 75%
2. Pest management (insects, mites, weeds, and diseases) - 38%
3. Farm machinery and equipment - 38%

Vegetable and melon (n=134)

1. Soil health stewardship - 90%
2. Pest management (insects, mites, weeds, and diseases) – 85%
3. Vegetable crop production - 82%

Fruit and nut (n=96)

1. Soil health stewardship - 57%
2. Pest management (insects, mites, weeds, and diseases) - 57%
3. Fruit and nut crop production - 55%

Hay and forage (n=37)

1. Pest management (insects, mites, weeds, and diseases) - 15%
2. Marketing and sales - 15%
3. Whole farm operations - 14%

Greenhouse, nursery, floriculture (n=43)

1. Soil health stewardship - 67%
2. Vegetable crop production - 56%
3. Fruit and nut crop production - 53%

Seeds (n=29)

1. Post-harvest handling, storage, and distribution - 66%
2. Vegetable crop production - 59%
3. Soil health stewardship - 59%

4.4 EXTENSION PERCEPTIONS AND EXPERIENCES

Awareness of Extension

Around half of survey respondents have heard of extension before:

- Producers: 53% (n=155)
- Processors: 46% (n=13)
- Producer-processors: 48% (n=31)

Survey respondents had a moderately high level of agreement (73 out of 100, n=204) that extension can help with achieving their farm/business goals.

- Producers: 73/100 (n=160)
- Producer-processors: 77/100 (n=31)
- Processors: 66/100 (n=13)

Survey respondents who are more familiar with extension had a higher level of agreement with the statement that extension can help them achieve their farm/business goals.

- Not familiar with extension: average level of agreement of 66% (n=96)
- Familiar with extension: average level of agreement of 81% (n=103)

The most common responses from interviewees about what comes to mind when hearing the word "extension" are problem-solving help, help with information access, and farmer-to-farmer support.

Problem-solving help: Someone to call if I have a question or an issue to resolve. Participants imagine a person they can call, rather than accessing a website or static resources, as a source of advice for problem-solving. Established organic farmers remember when Rochelle Eisen was the Organic BC extension agent from 2007 to 2010. She was available by phone/email to answer questions and provide appropriate resources. She also monitored an organic listserv where members could pose questions and ask for support from their peers. The previous organic extension service was remembered positively by interviewees. Some farmers shared that they call the AFF organic specialist or regional agrologist for support, but others were unclear about how much one-on-one problem solving advice they can provide.

Help with accessing or navigating relevant organic information for my problem. This includes help navigating and accessing the voluminous information and resources (most often from other jurisdictions and agriculture environments available online). Participants shared that it would be helpful to have a central point of contact, or information hub, for organic-regenerative agriculture. Effective extension should also entail proactive dissemination of critical information and research findings, and not just responding to farmers' immediate information needs. Extension also routinely promotes the work of farmers who have developed innovative and effective practices. This could be done numerous ways, e.g. field days, replicative demonstrations, presentations, conferences, mailing lists.

Farmer to farmer support. Participants talked about the value of being able to learn from other farmers to address farming challenges, and otherwise learn about other farmers' approaches and methods. However, learning from or connecting to other organic farmers can be a challenge for farmers who are not well connected – for example, new entrants, those living in more remote areas, or in areas with few organic farmers/ranchers. Extension can and frequently does employ farmer-to-farmer approaches in programs (e.g. recognize that farmers are experts), by facilitating farmer connection, by strengthening farmer networks, and by promoting the practices of successful farms.

Other responses:

- One farmer, a new entrant, was not familiar with the term 'extension' or its purpose.
- Other extension programs that come to mind are publications (e.g. production guides), farm tours, and on-farm research trials.
- Familiarity with the US model of cooperative extension, coordinated out of universities.
- Coordination between industry, government, and universities is seen as valuable and a viable extension model.

Assessment of Available Extension

Survey respondents were asked to list the organic extension providers they have used in the past (Table 6). The predominant organizations listed by respondents were Organic BC and AFF. Less frequently mentioned providers are Young Agrarians, certification bodies, other farmers/businesses, private consultants, and industry/commodity groups. Post-secondary institutions were not high on the list. This is particularly unfortunate because universities house the preponderance of BC's applied agriculture researchers and many are highly experienced at extension programming.

Responses varied among individual farmers interviewed about whether their own needs are well served by current extension services.

Table 6. Organic extension providers from survey (n=115).

Extension provider	Frequency
Organic BC	36
AFF resources (incl. organic specialist, regional agrologists, industry specialists, other programs)	27
Young Agrarians	17
Certification bodies	17
Other farmers/businesses	16
Private consultants	15
Industry/commodity groups	15
BC post-secondary institutions	12
Non-profit sector groups	12
Unaware of services, or services not available	12
Farmers institutes, agricultural associations	10
Resources outside of BC (e.g. other Canada, US)	8
Publications, other media	4
Other	7

Regional agrologists: Farmers varied in their perception and experiences with regional agrologists. Some had positive things to say about the support they have received from their regional agrologist. Some were unsure what support they could get. Others indicated they had previously requested a farm visit and were told that there is no budget for that kind of one-on-one personalized extension.

Organic specialist: Again, farmers had varied perceptions and experiences with the organic specialist. Some shared that they had received help with their questions, while others were unsure about the organic specialist's role in extension. A few farmers noted that because the sector is so diverse, one person cannot be expected to have all the answers or be able to support an entire sector.

Young Agrarians: The 3 relatively new entrants interviewed for the study noted that support from YA has been important for them in the form of land access, mentorship, networking, and learning about available resources. Other farmers who were not new entrants also perceived YA as being a key support for young farmers.

Organic BC Conference: The annual Organic BC (formerly COABC) conference is an important gathering and networking time for the BC organic sector. However, there are some limitations. It only happens once a year, and may not be accessible to all farmers due to the cost of admission, travel, and accommodation. The activities could be improved by being more relevant to sector needs and incorporating skill development or hands-on demonstrations.

Certifying bodies (CBs): Some CBs provide ad-hoc support by answering questions or providing referrals. Volunteer-run CBs have limited capacity and funding to organize or provide extension programming. CBs are limited in providing individualized advice to paying member-operators due to conflict of interest. One common practice among CBs is to refer farmers with questions to private consultants.

Universities: Universities are seen more as a resource for finding out about the latest agricultural research, but are not known as or perceived by the sector as significant providers of extension in BC as they are in other jurisdictions.

Preferences for Delivery Methods

Respondents were asked to rate the effectiveness of different extension delivery methods they have used in the past, from 1 (not effective) to 5 (extremely effective). The top 3 delivery methods, likely reflective of what is occurring now, were one-on-on / farmer-to-farmer mentorship and training (4.01), videos (3.74), and field days, demonstrations, and farm/facility tours (3.67).

Table 7. Extension delivery methods rated by effectiveness (n=187).

Extension delivery type	Effectiveness (out of 5)
1. One-on-one or farmer-to-farmer mentorship/training	4.01
2. Videos	3.74
3. Field days, demonstrations, farm/facility tours	3.67
4. Webinars and online courses	3.55
5. Workshops	3.53
6. Short courses	3.48
7. Farm schools	3.4
8. Meetings and conferences	3.38
9. Research briefs	3.29
10. Technical bulletins	3.25
11. Private sector advisors	3.24
12. Research participation	3.22
13. Public sector advisors	3.06
14. Web forums	3.04
15. Information listserv	3.03
16. Trade publications	2.85
17. Business incubator	2.17

Respondents were asked to rate their interest in using different extension delivery methods in the future, from 1 (not interested) to 5 (extremely interested). The top 3 highest rated for this question are workshops (4.07), one-on-one/farmer-to-farmer mentorship and training (4.03), and public sector advisors (3.96).

Table 8. Extension delivery methods rated by interest (n=188).

Extension delivery type	Interest (out of 5)
1. Workshops	4.07
2. One-on-one or farmer-to-farmer mentorship/training	4.03
3. Public sector advisors (e.g. government agrologists, university experts)	3.96
4. Field days, demonstrations, farm/facility tours	3.94
5. Research participation	3.77
6. Short courses	3.7
7. Videos	3.65
8. Webinars and online courses	3.62
9. Research briefs	3.52
10. Technical bulletins	3.52
11. Meetings and conferences	3.3
12. Trade publications	3.1
13. Web forums	2.98
14. Private sector advisors	2.96
15. Business incubator	2.95
16. Information listserv	2.87
17. Farm schools	2.82

Barriers

Respondents were asked to rate different factors that limit their ability to use or access organic extension, from 1 (not limiting) to 5 (extremely limiting). The top three limiting factors are lack of availability (3.85), cost (3.79), and distance (3.76).

Table 9. Barriers to using or accessing extension (n=187).

Barrier	Average (out of 5)
1. Services I need are not available	3.85
2. Services are too expensive	3.79
3. Services are too far away	3.76
4. Services do not fit with my schedule/availability	3.55
5. I do not know how to access the services I need	3.42
6. I do not have time to access extension	2.9
7. I do not have reliable access to high speed internet or a computer	1.56

Top 3 barriers to using extension, by region. Numbers in brackets are weighted average out of 5.

Vancouver Island/Coast (n=79)

1. Services I need are not available (3.88)
2. Services are too far away (3.83)
3. Services are too expensive (3.79)

South Coast (n=37)

1. Services are too expensive (3.73)
2. Services I need are not available (3.68)
3. Services do not fit with my schedule/availability (3.47)

Thompson Nicola (n=13)

1. Services are too expensive (4.08)
2. Services are too far away (3.9)
3. Services I need are not available (3.88)

Okanagan (n=27)

1. Services I need are not available (3.86)
2. Services are too far away (3.76)
3. Services do not fit with my schedule/availability (3.73)

Omineca Skeena (n=5)

1. Services I need are not available (4.33)
2. Services are too far away (4.2)
3. Services are too expensive (4)

Peace (n=3)

1. Services I need are not available (4.5)
2. Services are too far away (4.33)
3. I do not know how to access the services I need (3.33)

Cariboo-Chilcotin Coast (n=9)

1. Services are too far away (4.57)
2. I do not have reliable access to high speed internet or a computer (4)
3. Services are too expensive (3.67)

Kootenay (n=21)

1. Services are too far away (4.06)
2. Services are too expensive (4)
3. Services I need are not available (4)

Support for Coordinated Province-wide Extension

Survey respondents had a fairly high level of agreement (81/100) with the idea that a coordinated province-wide organic extension service will be valuable to the entire organic sector in BC. Those who had heard of extension before had a slightly higher level of agreement (84/100) than those who had not heard of extension before (76/100).

There are a range of ideas from interviewees on what the priorities of a coordinated organic extension service should be:

Organic-specific information: For some topics (e.g. pest identification), knowledge and information will be applicable to all farmers, organic or not. However, the certified organic sector has distinct needs in terms of management practices and inputs. Organic-specific information can be beneficial to non-organic or non-certified organic farmers as well. From speaking with extension actors in the Cariboo and northern BC, although there are few certified organic farmers in their regions, there is a growing interest in regenerative practices. Thus, there is an opportunity for a coordinated organic extension service to build bridges between the organic and conventional sectors and move away from segregated objectives and methods.

Research links: Extension should ensure that organic research results are reported back to the sector, and ensure that those results are applied or used. Additionally, extension should build farmers' capacity to carry out cooperative on-farm applied research and trials.

Network-building: Extension should build connections among farmers, among different actors in the organic sector (including academia, government, and NGOs), and among the different regions in the province. Extension must recognize that different regions and subsectors will have specific extension needs in addition to common ones.

Sustainability goals: Extension should aim to address larger sustainable goals such as climate change mitigation, and the strengthening of regional food systems.

5.0 MEETING ORGANIC EXTENSION NEEDS IN BC

5.1 GAP ANALYSIS: POLICY

Based on an analysis of extension policy gaps (Table 10), we present the following high-level recommendations for governance, sector participation, and design of the organic extension service:

Governance:

- Have a long-term strategy collaboratively developed between AFF, Organic BC, key universities, and other sector stakeholders.
- Advocate for public funding commitment.
- Develop sector extension funding commitment/mechanism.

Sector participation:

- Include sector representatives in governance and program planning and development.
- Ensure participatory approaches (including farmer-to-farmer) in extension strategic planning and program design and delivery.

Table 10. Analysis of extension policy gaps and high level recommendations.

Policy area	Current state	Desired future state	Recommendation
Governance			
Explicit long-term extension strategy	No explicit strategy identified, beyond indication in Organic BC strategic plan of intention to drive extension development	Explicit long-term strategy to enable and guide organic extension efforts	Long-term strategy collaboratively developed between AFF, Organic BC, key universities, other sector stakeholders
Sustained funding for extension	Limited public funding for extension programs in general Federal-provincial funding envelope in 5 year terms No sector funding mechanism in place	Stable and sustained funding for organic extension	Advocate for public funding commitment Develop sector extension funding commitment / mechanism

Sector Links and Participation			
Producer needs linked to extension	Individual extension actors have existing relationships with individual producers and food/agriculture organizations (not just organic)	Consistent communication between organic producers/sector and extension service Consistent communication with non-organic producers and sector	Include sector representatives in governance and program planning and development
Farmer engaged, farmer-to-farmer / participatory approaches to extension	Farmer engaged, farmer-to-farmer programming is valued Not all farmers feel connected to a peer network they can ask for support	Extension service facilitates and coordinates, farmer engaged and farmer-to-farmer/ participatory applied research and extension programming	Ensure farmer-to-farmer and participatory approaches in extension strategic planning and program design
Extension Service Design and Structures			
Coordination of extension	Extension efforts are piecemeal. No organic sector extension policy or shared agenda developed Extension actors see substantial benefit/ desire from coordination and collaboration	Pluralistic extension is coordinated, streamlined, collaborative Programs offered under shared long-term strategic policy/goals	Establish an administrative body responsible for coordination of extension agenda, actors, and programs
Extension provider capacity	Scan shows extension often an ad-hoc, one-off activity Extension actors want to offer more services and programs, but capacity limited by funding availability and consistency Many have extension experience and expertise (US and internationally)	Extension providers have capacity in technical, managerial, leadership, adult education Sufficient resourcing to reduce overburden and achieve long term impact	Secure funding to hire additional dedicated extension personnel with general agriculture acumen and speciality areas matching organic sector needs (pest, soil, livestock, horticulture, business) and to support existing university based extension, and extension programming.

Monitoring and evaluation	Evaluation dependent on individual extension actors (e.g. reporting to grant funders, self-assessment)	Monitoring and evaluation systems in place to ensure extension meets needs	Ensure extension service is accountable to a governing body (AFF and sector representatives) for performance and impact
Use of technology for extension	Abundance of online information can be confusing, difficult to navigate, not necessarily applicable to BC Various platforms and tools used by extension actors COVID-19 pandemic resulted in widespread use of technology for digital engagement	Use of technology extends reach of extension and saves resources Extension users have access to high quality, organic specific, reliable, regionally specific information Information curation and dissemination is facilitated by extension	Use technology for extension collaboration and delivery Include extension communications platform (e.g. BC Food Web) as "one-stop shop" for organic extension resources Ensure ongoing maintenance, curation
Extension design to meet complex challenges	Survey shows awareness and perceptions of extension are focused on day-to-day/ technical problem-solving	Extension strategy and goals integrated with policies around climate action, sustainability (environmental, social, and economic), sector development, consumer awareness reconciliation	Make organic extension available to all (not limited to certified organic) Design extension programs to span entire food system (not just production) Link organic extension to climate, sustainability, reconciliation initiatives

Service design:

- Establish an administrative body responsible for coordination of extension agenda, actors, and programs.
- Secure funding to hire additional dedicated extension personnel with general agriculture acumen and speciality areas matching organic sector needs (pest, soil, livestock, horticulture, business management) and to support existing university based extension, and extension programming.
- Ensure the extension service is accountable to a governing body (AFF and sector representatives) for performance and impact.
- Use technology for extension collaboration and delivery. Include extension communications platform (e.g. BC Food Web) as "one-stop shop" for organic extension resources. Ensure ongoing maintenance, curation.
- Make organic extension available to all (not limited to certified organic).

- Design extension programs to span the entire food system (not just production).
- Link organic extension to climate, sustainability, reconciliation initiatives.

5.2 GAP ANALYSIS: RESOURCES AND EXPERTISE

Applied research

Universities in BC are conducting applied research specific or relevant to organic agriculture. With additional extension capacity, more can be done to translate and disseminate results to reach the organic sector more widely. There are numerous relevant applied research projects on soil and nutrient management (e.g. UBC, KPU, UFV, TRU). Organic horticulture-related applied research is more concentrated around the Lower Mainland/Fraser Valley and Okanagan. For livestock and forage, few organic-specific resources were identified in the scan. However, strong interest in collaboration was conveyed by TRU and UNBC contacts who have expertise related to sustainable ranching and forage. KPU engages in some organic poultry and hog production demonstration and research.

Farm business management

A number of programs exist to offer farm business management support relevant to the organic sector, including AFF's new Small Farm Business Accelerator pilot, YA's B.C. Business Mentorship network (7 years

Table 11. Organic sector challenges matched with existing resources or expertise in BC (organic and non-organic).

Sector Challenge	Organic Resources or Expertise in BC	Other Relevant Resources in BC (non-organic)
Agronomic		
Organic arthropod, weed, and disease pest management	Post-Secondary • UBC CSFS • KPU Sustainable Agriculture program, ISFS • Industry and Private Sector: • IPM consultants with organic expertise	Government • BC Plant Health Laboratory • AFF Entomologists and Pathologists • Agriculture and Agri-food Canada
Organic soil health and fertility management	Industry and Private Sector: • Consultants with organic soil/nutrient management expertise Post-Secondary • UBC CSFS (e.g. Sustainable Agriculture Landscapes lab) • KPU ISFS • UFV	Government • Provincial Soil and Nutrient Management Specialists • Environmental Farm Plan Program • BC Beneficial Management Practices program (funding) Post-Secondary • TRU Industry and Private Sector: • BC Interior Soil Health Association (new)

Variety evaluation/ improvement (organic horticulture and field crops)	Post-Secondary • UFV researchers (e.g. Renee Prasad) • KPU ISFS • Organic Science Cluster III (2018-2023) Other • Canadian Organic Vegetable Improvement (CANOVI) • Farm Folk City Folk- BC Seeds Program	Other • West Coast Seeds • Agriculture and Agri-food Canada small fruit and tree fruit breeding programs
Season extension and farm equipment	Post-Secondary • KPU ISFS, Sustainable Agriculture • UBC CSFS (digital technology)	Post-Secondary • UFV • College of New Caledonia
Organic livestock management, herd health	Post-Secondary • KPU ISFS	Industry and Private Sector: • Small Scale Meat Producers Association Post-Secondary • TRU Applied Sustainable Ranching Government • BC Animal Health Centre
Pasture management, hay and forage production		Industry and Private Sector: • BC Forage Council • Peace River Forage Association of BC Post-secondary • TRU • UNBC
Business Management		
Farm business development and management	Post-Secondary • KPU ISFS	Government • BC Agri-Business Planning Program • BC Small Farm Business Acceleration Pilot Post-Secondary • UBC CSFS Feeding Growth Program
Distribution and marketing		Other • Regional food hubs • Buy BC Partnership Program
Regulatory Challenges		
Organic inputs information	Industry and Private Sector • Certification bodies (ad-hoc)[2]	Suggested • Organic Materials Review Institute Canada (OMRI Canada)

[2] At the time of publishing this report, Organic BC has just finished developing an allowable inputs list to be shared widely.

Organic certification	Industry or Private Sector • Consultants (e.g. IOIA accredited organic consultants) • Organic BC • Certification bodies	
Food processing		Government • BC Lean for Food Processing Industry or Private Sector: • Small Scale Food Processors Association • BC Food and Beverage Association
Other non-agronomic challenges		
Consumer demand		Other • Farm Folk City Folk public / consumer initiatives around climate smart agriculture
Land access and affordability	Post-Secondary • KPU ISFS	Government • BC Land Matching Program (via Young Agrarians)
Labour availability and cost		Industry or Private Sector: • Western Agriculture Labour Initiative
Farming in remote regions	Post-Secondary • KPU ISFS	Regional agricultural support organizations (various)
Access to certified organic slaughter facilities		

old), and AFF's Agri-Business Planning Program (10+ years old). KPU's (26) organic crop and stock production enterprise budgets are now 6 years old. As our survey results indicate business management continues to be a priority; extension should build on existing programs and capacities, and raise awareness of existing programs in the organic sector.

Regulatory issues

Extension scan identified very limited capacity and resources to address regulatory issues specific to the certified organic sector (inputs, certification). There is a need and opportunity for targeted extension to support current certified organic operators (CBs are not extension providers), and to "demystify" the certification process in order to encourage more producers and processors to certify. Extension should collaborate with food processor associations to promote existing supports for processors.

Non-agronomic challenges

There is a gap in public/consumer education to raise awareness and build demand for BC organic food. The BC land matching program is a potential extension partner for information sharing, networking, and referrals.

5.3 OPPORTUNITIES ANALYSIS

We have identified the following internal and external opportunities that support the development of a coordinated organic extension service.

Sector readiness: Extension is a key pillar in Organic BC's strategic plan. Our survey results show strong support among producers for coordinated organic extension, and strong interest in accessing extension services. Interviewed extension providers report strong interest from conventional farmers in adopting regenerative and sustainable methods.

COVID recovery for BC agriculture and food: There is an opportunity to invest in extension to transform the food system towards resilience and sustainability through widespread adoption of organic practices. Interviewees also reported that they have seen increased consumer interest in sustainable and locally produced food during the pandemic.

Extension actor readiness: Potential collaborators indicate strong interest in a coordinated extension service, and willingness to participate either as core actors (e.g. management, coordinated service delivery) or as allies (e.g. communications support, referrals, ad-hoc partnerships). There are existing applied researchers, research farms, regional agriculture organizations, and extension programs that can be linked and built upon by an organic extension service.

Cost-savings from collaboration: Potential collaborators indicated that coordination and collaboration on extension can reduce duplication of efforts, for example with respect to fundraising and administration.

Market opportunities: Demand for organic food in Canada (and BC) is growing, and most of this demand is being met by organic imports.[1] Organic food processors and distributors want to source far more locally produced organic ingredients.

5.4 PROPOSED CONCEPT

Based on our findings and analysis, we have developed an initial concept for the purpose, functions, and structure of an organic extension service (Table 12).

Extension Service Purpose: To advance a sustainable food system by promoting widespread understanding and adoption of organic practices throughout BC's agriculture and food system, and by supporting BC's organic sector to thrive and expand.

Focus: An organic extension service must generate and put forward information and support that is compliant and consistent with Canadian organic standards. At the same time, the service must be accessible to and inclusive of all farmers and processors.

Functions: Based on the needs assessment, the sector would benefit from a range of extension functions from day-to-day services to long-term initiatives. For example:

- STRATEGIC INITIATIVES: Multi-year programs to build capacity at community and sector level
- EDUCATION PROGRAMS: Workshops, events, and webinars for farmers, ranchers, and consumers
- ADVISING: One-on-one or group problem solving support
- INFORMATION & TOOLS: One-stop shop for relevant and reliable information, tools

1 Annual organic sales in Canada grew from $1B in 2012 to $6.9B in 2020. Canada's organic imports in 2019 were estimated at $788.9M, up 20% from 2018 (Canada Organic Trade Association, 2019).

Structure: Our current concept for the service is a collaborative of committed extension actors (individuals and organizations) offering coordinated organic extension services per a mutually conceived and shared agenda.

- Directors (2-3 members) to provide high level oversight and accountability, and would comprise representatives from AFF, Organic BC, and the First Nations Agriculture Association
- Management team (6-8 members) to lead strategic planning and management of the service
- Extension providers to design, develop, and deliver extension programs based on strategic direction set by the Management Team. Includes current extension providers (e.g. universities, regional agriculture support groups), as well as additional dedicated organic extension personnel
- Administration (1 organization or entity) to provide operational support (e.g. hiring, finance, contracts, event coordination, internal and external communications)

The following extension actors have indicated strong and concrete interest in establishing a coordinated extension service as members of the Management Team.

- KPU Institute for Sustainable Food Systems
- UBC Centre for Sustainable Food Systems
- TRU Applied Sustainable Ranching
- UNBC agricultural extension
- Northern Environmental Action Team (NEAT) Northern Co-Hort
- UFV (to be confirmed)

Table 12. Representation of proposed organic extension concept

	Outputs		Outcomes		
Inputs (Resources)	Participants	Activities (programs, initiatives, materials)	Immediate (awareness, knowledge, opinions, skills) 1-5 yrs	Medium-term (practices, behaviours, policies, choices) 5-10 yrs	Long-term (Social, economic, environmental impacts) 10+ yrs
People Network of regional extension agents Access to subject matter experts **Coordination** Shared priorities and agenda Information sharing **Infrastructure** Regional sites for applied research, demosntrations and hands-on learning **Financial** Sustained core funding Cost-recovery programs	**Target audiences** Farmers, ranchers, food businesses currently engaged or interested in organic agriculture and food Indigenous Nations and communities Public and consumers **Potential collaborators** Target audiences engaged as partners Post-secondary institutions Industry groups NGOs Government	**Strategic initiatives** Multi-year programs to address identified community and sector priorities **Educational activities** e.g. workshops, events, field demonstrations, webinars **Problem solving** e.g. advising, 1-on-1 info exchange **Access to info/ tools** e.g. onling hub, enterprise budgets, videos, apps	**Increase in**: For producesr/ processors: Regionally appropriate evidence-based knowledge, information and skills about organic and regenerative agriculture and food Understanding of organic regulations and ease of certification process For indigenous communities: Access to culturally appropriate, accessible information and support regarding organic and regenerative agriculture to meet community food objectives For public: Increased awreness and understanding about organic agriculture and food	**Increase in**: Sector development: Adoption of organic & regenerative agricultural practices New entrats to organic and regenerative farming Certified organic farms and processors Economic development: Profitability and viability of organic/ regenerative farms and businessess Supply of organic indegredients for the processing market Other: Consumer awareness, demand, and advocacy for organic food Policy and institutional support for organic agriculture and food	A thriving and resilient agriculture sector in BC where organic & regenerative practices are widely adopted Organic and regenerative agriculture is major contributor to economic development, climate change mitigation, environmental stewardship, and food security

6.0 NEXT STEPS

We will be working with the identified Management Team collaborators to develop recommendations for the following deliverables:

- Organic Sector Extension Service start-up, staffing, on-going operations, and administration/ coordination plan (proposal).
- Start-up and maintenance budget.
- Start-up and on-going funding strategy (proposal).
- Communications and outreach plan (proposal).

Collaboratively developed recommendations will be presented in the April 30th final project report.

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APPENDIX A - SECTOR SURVEY

Survey Questionnaire

Title of Research Project: BC Organic Extension Study – Needs Assessment Survey

Principal Investigator: Dr. Kent Mullinix

You have been invited to participate in a survey about the need for agricultural extension services in BC's organic sector. This project is designed and executed by the Institute for Sustainable Food Systems (ISFS) at Kwantlen Polytechnic University (KPU). The survey can be completed online in approximately 15 minutes. Please review the informed consent information and contact the principal investigator if you have any questions.

Purpose of the Study

The main goal of this study is to advance our understanding of the organic sector's needs for agricultural extension services, the types of extension services currently being accessed, topics of interest to the sector, and preferences for how to receive information. Results of this study will be used to inform the creation of an extension program that will provide relevant and high quality education and training for BC's organic sector.

Voluntary Participation

Your participation is voluntary. You may withdraw from the study by simply clicking the exit link on the top right hand corner or closing your web browser at any time. Any responses you completed up to that point will be deleted. You may skip any of the questions you do not wish to answer. There will be no negative consequences for an incomplete survey response or withdrawal.

Procedures and Confidentiality

Your answers are completely anonymous. Survey responses will be summarized and reported in an aggregate form within a report submitted to the BC Ministry of Agriculture. The report will be published on the ISFS website at https://www.kpu.ca/isfs/publications.

Please note that when doing online research, there is always the chance of hacking from outside sources. To protect you, we will do the following: (a) we are not asking you to provide personally identifiable information; (b) we will disable IP address tracking by our online survey; (c) we will download and store your data on a secure KPU server; (d) after downloading, we will delete your responses from the online survey tool; and (e) we will treat your anonymized data confidentially and will only allow the research team or future researchers to have access to the data. We suggest that you disable any browser cookies before beginning this survey or clear them after completing the survey.

Risks of Harm/Discomforts/Inconvenience

We expect a minimal amount of possible discomfort from questions targeting farming challenges faced on your farm or business. If you become distressed during the online survey process, you can stop the survey at any time. You can contact ISFS Director Kent Mullinix to express your concerns.

Benefits

All participants will be given the chance to win one of 5 $200 gift cards by completing the survey. To participate in the raffle, you will be asked to enter your contact information at the end of the survey.

Your participation will help us develop a province-wide organic extension service plan. Indirectly, the results will help improve access to relevant and high-quality education and training for BC's organic sector.

Contact Information

By consenting to participate, you have not waived your rights to legal recourse in the event of research related harm. If you wish to contact someone regarding this research, contact the principal investigator, Dr. Kent Mullinix (Tel: 604-599-2540 or email: kent.mullinix@kpu.ca) or the Kwantlen Polytechnic University Research Ethics Board at 604-599-3163 or reb@kpu.ca.

1. I agree to participate in this study.

I understand the purpose and nature of this study and I am participating voluntarily. I understand that I can withdraw from the study at any time without any penalty or consequences by closing the web browser. I understand that I can skip any questions that I do not feel comfortable with or wish to answer.

a. Yes

b. No

(Note: A response of Yes is required to move forward in the survey. A response of No ends the survey.)

2. What is your age?

a. Under 19

b. 19 to 29

c. 30 to 39

d. 40 to 49

e. 50 to 59

f. 60 to 69

g. 70+

(Note about Q2: A response of Under 19 will end the survey at Section 2.)

3. What is your gender identity?

a. Male

b. Female

c. Prefer not to answer

d. My gender is _____.

4. What is the highest level of formal accredited education you have completed? If currently enrolled, choose the highest degree completed.

a. Less than high school

b. High school diploma or equivalent

c. Some college or university

d. Completed college diploma or certificate (incl. trade apprenticeship)

e. Completed undergraduate degree (Bachelors)

f. Completed graduate degree (Masters, PhD)

g. Prefer not to answer

5. Is your formal education related to agriculture or food? If yes, please describe (e.g. bachelor's degree in agriculture; diploma in horticulture).

a. No

b. Yes: _____

6. What is your ethnicity?

a. Indigenous

b. Metis

c. Inuk

d. South Asian (e.g. East Indian, Pakistani, Sri Lankan, etc.)

e. Chinese

f. Black

g. Filipino

h. Latin American

i. Arab

j. Southeast Asian (e.g. Vietnamese, Cambodian, Thai, Laotian, etc.)

k. West Asian (e.g. Iranian, Afghan, etc.)

l. Korean

m. Japanese

n. White

o. Prefer not to answer

p. Other (please specify)

7. Which of the following best describes your organization?

a. Agricultural producer (e.g. crop/livestock producer)

b. Post-production business (e.g. processor, packer, handler)

c. Both (e.g. producer with on-farm processing operation)

(Survey Monkey skip logic starts here:

If respondent chooses A, they will only see questions 8-26

If respondent chooses B, they will only see questions 27-44

If respondent chooses C, they will only see questions 45-66

All respondents see questions 66 to the end.)

If you have more than one farm business, the following questions relate to your primary farm business.

8. Which of the following best describes your role within your farm or business?

a. Owner-operator

b. Owner (non-operator)

c. Operator/Manager

d. Employee

e. Other:

9. How many years of farming experience do you have?

a. 0 to 2

b. 3 to 5

c. 6 to 10

d. 11+

10. Which best describes your production system?

a. Certified organic

b. In transition to certified organic

c. Ecological/regenerative but not certified organic

d. Conventional but interested in transitioning to certified organic

e. Conventional but interested in adopting organic practices

f. Other:

(Note: If they choose A, they will see section 5 and question 16.)

11. Which of the following activities best describe your farm? Check all that apply.

a. Diversified operation (livestock and crop production)

b. Beef production

c. Dairy production

d. Hog production

e. Poultry and egg production

f. Sheep and goat production

g. Oilseed and grain production

h. Vegetable and melon production

i. Fruit and nut production

j. Hay and forage production

k. Greenhouse, nursery, and floriculture production

l. Seed production

m. Other (please specify):

12. How many acres did you actively farm in 2019? (short answer text box)

13. How many employees did you have in 2019, including yourself? Please include permanent, seasonal, and casual employees.

a. 1

b. 2-4

c. 5-9

d. 10-19

e. 20-49

f. 50-199

g. 200+

14. In what region of BC do you farm? Check all that apply. You may refer to the map below.

a. Vancouver Island/Coast

b. South Coast

c. Cariboo-Chilcotin Coast

d. Thompson-Nicola

e. Okanagan

f. Kootenay

g. Omineca Skeena

h. Peace

15. What are the first three digits of the postal code where your farm/business is located? (short answer text box)

16. How many years have you farmed as certified organic?

a. Less than 2

b. 3 to 5

c. 6 to 10

d. More than 10

e. Other:

17. What are your long-term goals or priorities for your farm/business? (long answer text box)

18. Please select the main areas where you need support to achieve your long-term goals or priorities for your farm/business. Check all that apply.

a. Whole farm operations
b. Vegetable and field crop production
c. Fruit and nut production
d. Harvest
e. Post-harvest handling, storage, and distribution
f. Livestock production
g. Slaughter and handling of animal products
h. Pest management (insects, weeds, diseases)
i. Information, communication, and management technology
j. Farm machinery and equipment
k. Farm infrastructure management
l. Soil health stewardship
m. Water resources management
n. Marketing and sales
o. Recordkeeping
p. Food safety and certification
q. Business management
r. Human resources management
s. Financial management
t. Other:

19. If you are inclined, please provide details on the areas where you need support that you selected in the previous question. (Long answer text box)

Agriculture and Post-Production Extension is strategic, calculated 'informal' educational programming to facilitate the application of new knowledge, methods or tools, developed through applied research (wherever it may occur), to address identified challenges and improve individual operations or the sector on the whole.

Examples of informal education include: One-on-one support, demonstrations, tours, field days, print and digital materials, newsletters, workshops, symposia, seminars, short courses, farm schools, industry conferences, and presentations.

20. Have you heard of agriculture and post-production extension before?

a. Yes

b. No

21. Please rate your level of agreement with this statement: “Agriculture and post-production extension can help me reach my farm/business goals”. Sliding scale: “Do not agree” to “Completely agree”

22. What extension activities are available for the organic sector in BC that you are aware of? Check all that apply.

a. Public sector advisors (e.g. government regional agrologists, university experts)

b. Private sector advisors/consultants

c. Farmer-to-farmer mentorship/training

d. Workshops

e. Field days, demonstrations, farm tours

f. Meetings and conferences

g. Short courses

h. Farm schools

i. Technical bulletins

j. Research briefs

k. Trade publications

l. Participation in agricultural research (e.g. on-farm research trials)

m. Webinars and online courses

n. Videos on YouTube or other platforms

o. Information listserv

p. Web forums

q. Other (please specify):

23. Please think about the extension activities for the organic sector in BC that you have used in the past. On a scale of 1 to 5 with 1 as the lowest and 5 as the highest, how effective were they in meeting your needs?

	1 – Not effective	2	3	4	5 - Extremely effective	I have not used this before

Public sector advisors (e.g. government regional agrologists, university experts)						
Private sector advisors/consultants						
Farmer-to-farmer mentorship/ training						
Workshops						
Field days, demonstrations, farm tours						
Meetings and conferences						
Short courses						
Farm schools						
Technical bulletins						
Research briefs						
Trade publications						
Participation in agricultural research (e.g. on-farm research trials)						
Webinars and online courses						
Videos on YouTube or other platforms						
Information listserv						
Web forums						

24. Please think about your interest in future extension activities for the organic sector in BC. On a scale of 1 to 5, with 1 as the lowest and 5 as the highest, how interested are you in using each type of extension activity in the future?

	1 – Not interested	2	3	4	5 – Extremely interested	Don't know
Public sector advisors (e.g. government regional agrologists, university experts)						
Private sector advisors/consultants						
Farmer-to-farmer mentorship/ training						
Workshops						
Field days, demonstrations, farm tours						
Meetings and conferences						

Short courses						
Farm schools						
Technical bulletins						
Research briefs						
Trade publications						
Participation in agricultural research (e.g. on-farm research trials)						
Webinars and online courses						
Videos on YouTube or other platforms						
Information listserv						
Web forums						

25. Please list the main extension providers for the organic sector in BC that you have used in the past (e.g. your industry association, regional advisors, regional non-profit organizations, educational institutions, etc.). (Long answer text box)

26. Please think about factors that limit your ability to use or access extension for the organic sector in BC. On a scale of 1 to 5, with 1 as the lowest and 5 as the highest, how much do the following factors limit your ability to use or access extension?

	1 – Not limiting	2	3	4	5 – Extremely limiting	Don't know
Services are too expensive						
Services do not fit with my schedule/availability						
Services are too far away						
Services I need are not available						
I do not have reliable access to high speed internet or a computer						
I do not have time to access extension services						
I do not know how to access the services I need						
Other (please specify):						

If you have more than one post-production business, the following questions relate to your primary post-production business.

27. Which of the following best describes your role within your post-production business?

a. Owner-operator

b. Owner (non-operator)

c. Operator/Manager

d. Employee

e. Other:

28. Is your post-production business:

a. Certified organic only

b. Certified organic and conventional

c. Conventional only but interested in certified organic

d. Other:

29. Which of the following best describe the organic portion of your post-production business? Check all that apply.

a. Processing

b. Packing

c. Handling

d. Other:

30. Please briefly describe the nature of your post-production business. (e.g. “We prepare and can fruit jams and sell them at farmers markets”, “We roast, blend, grind, package, and distribute organic coffee”) (Short answer question)

31. How many employees did you have in 2019, including yourself? Please include permanent, seasonal, and casual employees.

a. 1

b. 2 to 4

c. 5 to 9

d. 10 to 19

e. 20 to 49

f. 50 to 199

g. 200+

32. In what region of BC does your business operate? Check all that apply. You may refer to the map below.

a. Vancouver Island/Coast

b. South Coast

c. Cariboo-Chilcotin Coast

d. Thompson-Nicola

e. Okanagan

f. Kootenay

g. Omenica Skeena

h. Peace

33. What are the first 3 digits of the postal code(s) where your business is located? (short answer text box)

34. What are your long-term goals or priorities for your post-production business, as it pertains to organic food? (long answer text box)

35. Please select the main areas where you need support to achieve your long-term goals or priorities that you shared above. Check all that apply.

a. Product innovations (e.g. developing new products, improving existing products)

b. Process innovations (e.g. developing new equipment/techniques/processes, improving existing equipment/techniques/processes)

c. Ingredient supply chain (e.g. sourcing organic ingredients, quality control, permitted additives)

d. Post-production equipment

e. Information, communication, and management technology

f. Distribution, storage, and handling

g. Quality control

h. Marketing and sales

i. Recordkeeping

j. Food safety and certification

k. Business management

l. Human resources management

m. Financial management

n. Other: please specify

36. If you are inclined, please provide details on the areas where you need support that you selected in the previous question. (Long answer text box)

Agriculture and Post-Production Extension is strategic, calculated 'informal' educational programming to facilitate the application of new knowledge, methods or tools, developed through applied research (wherever it may occur), to address identified challenges and improve individual operations or the sector on the whole.

Examples of informal education include: One-on-one support, demonstrations, tours, field days, print

and digital materials, newsletters, workshops, symposia, seminars, short courses, farm schools, industry conferences, and presentations.

37. Have you heard of agriculture and post-production extension before?

a. Yes

b. No

38. Please rate your level of agreement with this statement: “Agriculture and post-production extension can help me reach my business goals”. (Sliding scale: “Do not agree” to “Completely agree”)

39. What extension activities are available for the organic post-production sector in BC that you are aware of? Check all that apply.

a. Public sector advisor (e.g. government consultant, university expert)

b. Private sector advisors/consultants

c. One-on-one mentorship/training

d. Workshops

e. Facility and site tours/demonstrations

f. Meetings and conferences

g. Business incubator programs

h. Technical bulletins

i. Research briefs

j. Trade publications

k. Participation in applied research (e.g. university-industry research partnerships)

l. Webinars and online courses

m. Videos on YouTube or other platforms

n. Information listserv

o. Web forums

p. Other (please specify):

40. Please think about the extension activities for the organic post-production sector in BC that you have used in the past. On a scale of 1 to 5 with 1 as the lowest and 5 as the highest, how effective were they in meeting your needs?

	1 – Not interested	2	3	4	5 – Extremely interested	Don’t know

Public sector advisors (e.g. government regional agrologists, university experts)						
Private sector advisors/consultants						
Farmer-to-farmer mentorship/ training						
Workshops						
Field days, demonstrations, farm tours						
Meetings and conferences						
Short courses						
Farm schools						
Technical bulletins						
Research briefs						
Trade publications						
Participation in agricultural research (e.g. on-farm research trials)						
Webinars and online courses						
Videos on YouTube or other platforms						
Information listserv						
Web forums						

41. Please think about your interest in future extension activities for the organic post-production sector in BC. On a scale of 1 to 5, with 1 as the lowest and 5 as the highest, how interested are you in using each type of extension activity in the future?

	1 – Not interested	2	3	4	5 – Extremely interested	Don't know
Public sector advisor (e.g. government consultant, university expert)						
Private sector advisors/consultants						
Private sector advisors/consultants						
One-on-one mentorship/training						
Workshops						
Facility and site tours/ demonstrations						

Meetings and conferences						
Business incubator programs						
Technical bulletins						
Research briefs						
Trade publications						
Participation in applied research (e.g. university-industry research partnerships)						
Webinars and online courses						
Videos on YouTube or other platforms						
Information listserv						
Web forums						

42. Please list the main extension providers for the organic post-production sector in BC that you have used in the past (e.g. Industry associations, regional food hubs, regional advisors, educational institutions, etc.). (Long answer text box)

43. Please think about factors that limit your ability to use or access extension for the organic post-production sector in BC. On a scale of 1 to 5, with 1 as the lowest and 5 as the highest, how much do the following factors limit your ability to use or access extension?

	1 – Not limiting	2	3	4	5 – Extremely limiting	Don't know
Services are too expensive						
Services do not fit with my schedule/availability						
Services are too far away						
The services I need are not available						
I do not have reliable access to high speed internet or a computer						
I do not have time to access extension						
I do not know how to access the services I need						

44. Which of the following best describes your role within your farm or business?

a. Owner-operator

b. Owner (non-operator)

c. Operator/Manager

d. Employee

e. Other:

45. How many employees did you have in 2019, including yourself? Please include permanent, seasonal, and casual employees.

a. 1

b. 2 to 4

c. 5 to 9

d. 10 to 19

e. 20 to 49

f. 50 to 199

g. 200+

46. In what region of BC does your farm/business operate? Check all that apply. You may refer to the map below.

a. Vancouver Island/Coast

b. South Coast

c. Cariboo-Chilcotin Coast

d. Thompson-Nicola

e. Okanagan

f. Kootenay

g. Omenica Skeena

h. Peace

47. What are the first three digits of the postal code where your farm/business is located? (short answer text box)

The following questions relate to the farm/production portion of your business.

48. How many years of farming experience do you have?

a. 0 to 2

b. 3 to 5

c. 6 to 10

d. 11+

49. Which best describes your production system?

a. Certified organic

b. In transition to certified organic

c. Ecological/regenerative but not certified organic

d. Conventional but interested in transitioning to certified organic

e. Conventional but interested in adopting organic practices

f. Other:

(Note: If they choose A, they will see section 12 and question 55.)

50. Which of the following activities best describe your farm? Check all that apply.

a. Diversified operation (livestock and crop production)

b. Beef production

c. Dairy production

d. Hog production

e. Poultry and egg production

f. Sheep and goat production

g. Oilseed and grain production

h. Vegetable and melon production

i. Fruit and nut production

j. Hay and forage production

k. Greenhouse, nursery, and floriculture production

l. Seed production

m. Other (please specify):

51. How many acres did you actively farm in 2019? (short answer text box)

The following questions relate to the post-production portion of your business.

52. Is your post-production business:

a. Certified organic only

b. Certified organic and conventional

c. Conventional only but interested in certified organic

d. Other:

53. Which of the following best describe the organic portion of your post-production business? Check all that apply.

a. Processing

b. Packing

c. Handling

d. Other:

54. Please briefly describe the nature of your post-production business. (e.g. “We create jams using certified organic fruits”, “We roast, blend, grind, package, and distribute roasted organic coffee beans”) (Short answer question)

55. How many years have you farmed as certified organic?

a. 0 to 2

b. 3 to 5

c. 6 to 10

d. 11+

56. What are your long-term goals or priorities for your farm/business? (long answer text box)

57. Please select the main areas where you need support to achieve your long-term goals or priorities for your farm/business. Check all that apply.

a. Whole farm operations

b. Farm information, communication, and management technology

c. Vegetable crop production

d. Fruit and nut crop production

e. Harvest

f. Post-harvest handling, storage, and distribution

g. Livestock production

h. Slaughter and handling of animal products

i. Pest management (insects, mites, weeds, and diseases)

j. Farm machinery and equipment

k. Farm infrastructure management

l. Soil health stewardship

m. Water resources management

n. Product innovations (e.g. developing new products, improving existing products)

o. Process innovations (e.g. developing new equipment/techniques/processes, improving existing equipment/techniques/processes)

p. Ingredient supply chain (e.g. sourcing organic ingredients, quality control, permitted additives)

q. Post-production equipment

r. Quality control
s. Marketing and sales
t. Recordkeeping
u. Food safety and certification
v. Business management
w. Human resources management
x. Financial management
y. Other:

58. If you are inclined, please provide details on the areas where you need support that you selected in the previous question. Long answer text box

Agriculture and Post-Production Extension is strategic, calculated 'informal' educational programming to facilitate the application of new knowledge, methods or tools, developed through applied research (wherever it may occur), to address identified challenges and improve individual operations or the sector on the whole.

Examples of informal education include: One-on-one support, demonstrations, tours, field days, print and digital materials, newsletters, workshops, symposia, seminars, short courses, farm schools, industry conferences, and presentations.

59. Have you heard of agriculture and post-production extension before?

a. Yes
b. No

60. Please rate your level of agreement with this statement: "Agriculture and post-production extension can help me reach my business goals". (Sliding scale: "Do not agree" to "Completely agree")

61. What extension activities are available for the organic sector in BC that you are aware of? Check all that apply.

a. Public sector advisors (e.g. government consultants/agrologists, university experts)
b. Private sector advisors/consultants
c. One-on-one mentorship/training
d. Workshops
e. Field days, demonstrations, farm tours
f. Meetings and conferences
g. Short courses
h. Farm schools
i. Processing facility and site tours/demonstrations

j. Business incubator programs

k. Technical bulletins

l. Research briefs

m. Trade publications

n. Participation in agricultural research (e.g. on-farm research trials, university-industry research partnerships)

o. Webinars and online courses

p. Videos on YouTube or other platforms

q. Information listserv

r. Web forums

s. Other:

62. Please think about the extension activities for the organic sector in BC that you have used in the past. On a scale of 1 to 5 with 1 as the lowest and 5 as the highest, how effective were they in meeting your needs?

	1 – Not effective	2	3	4	5 – Extremely effective	I have not used this before
Public sector advisors (e.g. government consultants/ agrologists, university experts)						
Private sector advisors/consultants						
One-on-one mentorship/training						
Workshops						
Field days, demonstrations, farm tours						
Meetings and conferences						
Short courses						
Farm schools						
Processing facility and site tours/ demonstrations						
Business incubator programs						
Technical bulletins						
Research briefs						
Trade publications						

Participation in agricultural research (e.g. on-farm research trials, university-industry research partnerships)						
Webinars and online courses						
Videos on YouTube or other platforms						
Information listserv						
Web forums						

63. Please think about your interest in future extension activities for the organic sector in BC. On a scale of 1 to 5, with 1 as the lowest and 5 as the highest, how interested are you in using each type of extension activity in the future?

	1 – Not interested	2	3	4	5 – Extremely interested	I have not used this before
Public sector advisors (e.g. government consultants/ agrologists, university experts)						
Private sector advisors/consultants						
One-on-one mentorship/training						
Workshops						
Field days, demonstrations, farm tours						
Meetings and conferences						
Short courses						
Farm schools						
Processing facility and site tours/ demonstrations						
Business incubator programs						
Technical bulletins						
Research briefs						
Trade publications						
Participation in agricultural research (e.g. on-farm research trials, university-industry research partnerships)						
Webinars and online courses						

Videos on YouTube or other platforms						
Information listserv						
Web forums						

64. Please list the main extension providers for the organic sector in BC that you have used in the past (e.g., your industry association, regional advisors, regional non-profit organizations, food hubs, educational institutions, etc.). (long answer text box)

65. Please think about factors that limit your ability to use or access extension for the organic sector in BC. On a scale of 1 to 5, with 1 as the lowest and 5 as the highest, how much do the following factors limit your ability to use or access extension?

	1 – Not limiting	2	3	4	5 – Extremely limiting	Don't know
Services are too expensive						
Services do not fit with my schedule/availability						
Services are too far away						
Services I need are not available						
I do not have reliable access to high speed internet or a computer						
I do not have time to access extension services						
I do not know how to access the services I need						
Other (please specify)						

66. Please rate your level of agreement with this statement: "I believe that a coordinated province-wide organic extension service will be valuable to the entire organic sector in BC. (Sliding scale: from "Do not agree" to "Completely agree")

67. The results of this study will be used to inform the creation of a coordinated province-wide extension service that will provide relevant and high quality education and training for BC's organic sector.

How would you envision a coordinated province-wide organic extension service in BC? (Long answer text box)

68. Would you like to be entered into a raffle draw for a prize?

a. Yes

b. No

69. If yes, please enter your name and contact information for the chance to win one of five $200 gift cards. Winners will be able to choose a gift card from one of the following suppliers: (TBD, e.g. West Coast Seeds, Lee Valley). We will only use your contact information for the prize draw.

a. Name:

b. Phone:

c. Email:

APPENDIX B - SECTOR INTERVIEWS

Interviews were conducted with 18 key actors in the organic sector, representing producers,

processors, retailers, certification bodies, organic inspectors, and Organic BC from the regions of Vancouver Island, Lower Mainland, Thompson-Okanagan, Cariboo, Kootenay, and Omineca-Skeena. Interviewees were offered a $50 gift card for their participation.

The following questions were asked:

- AWARENESS: When you hear the word extension, what comes to mind for you?
- CHALLENGES: What are the major challenges faced by the organic sector (or your specific sub-sector) that can be addressed by extension?
- EFFECTIVENESS: If you think about the current extension services available, how well do those meet the needs of your/the sector? What's working well? What's missing?
- PRIORITIES: We believe that a sector wide extension service has to be strategic, has to be informed by a larger goal or strategy. What do you think should be the goals or priorities of a coordinated extension service for the BC organic sector? What would you like to see in a more effective and strategic extension service?

APPENDIX C - SECTOR ENGAGEMENT

Organic BC Contacts

- Jen Gamble- Liaison
- Eva-Lena Lang- Liaison
- Chris Bodnar- Working Group member
- Molly Thurston- Working Group member
- Gavin Wright- Working Group member

Project Advisory Committee

Name	Organization
Advisors	
Robin Tunnicliffe	Saanich Organics, Vancouver Island
Shirlene Cote	Earth Apple Farm, Surrey and Abbotsford
Dixon Terbasket	Syilx, Okanagan Nation Alliance, Penticton
Anna Helmer	Helmer's Organic Farm, Pemberton
Anita Georgy	Farm Folk City Folk, Vancouver
Linda Geggie	Capital Region Food and Agriculture Initiative Roundtable, Vancouver Island
Lorna Shuter	Shulus Community Garden Manager, Lower Nicola Band, Merritt
Tristan Banwell	Spray Creek Ranch, Lillooet
Joy Hall	Joy Farms, Chilliwack, Sto:lo Nation
Bess Legault	Northern Environmental Action Team, Peace River
Gillian Watt	Applied Sustainable Ranching Program Director, Thompson Rivers University
Arran Stephens	Nature's Path Organic Foods
Paddy Doherty	West Enderby Farm, PACS
Ex officio members	
Jen Gamble	Organic BC
Karina Sakalauskas	BC Ministry of Agriculture, Food and Fisheries (AFF)
KPU project research team	
Angeli dela Rosa	KPU ISFS
Leah Sandler	KPU ISFS
Kent Mullinix	KPU ISFS

Engagement with regional district governments

Regional District	Engagement
Alberni-Clayoquot (Regional District)	Meeting, January 8 2021
Bulkley-Nechako (Regional District)	Meeting, December 8 2021 Meeting, January 5 2021
Capital (Regional District)	Meeting, January 26 2021
Cariboo (Regional District)	Meeting, January 22 2021 Delegation, April 16 2021
Central Coast (Regional District)	Meeting, January 19 2021 Delegation, March 11 2021
Central Kootenay (Regional District)	Meeting, December 10 2021
Central Okanagan (Regional District)	Meeting with Central Okanagan Economic Development Commission, December 15 2021
Columbia Shuswap (Regional District)	(no response)
Comox Valley (Regional District)	Meeting, January 6 2021
Cowichan Valley (Regional District)	Meeting, December 10 2021 Delegation, March 24 2021
East Kootenay (Regional District)	Meeting, December 9 2021
Fraser Valley (Regional District)	Phone conversation, March 2 2021
Fraser-Fort George (Regional District)	Meeting, January 8 2021 Presentation to ALU Standing Committee, April 21 2021
Islands Trust (Islands Trust)	Meeting, January 22 2021 Delegation, March 9 2021 Endorsement provided
Kitimat-Stikine (Regional District)	Meeting, December 10 2021
Kootenay Boundary (Regional District)	(no response)
Metro Vancouver (Regional District)	Meeting, December 8 2021
Mount Waddington (Regional District)	Meeting, March 11 2021
Nanaimo (Regional District)	(no response)
North Coast (Regional District)	Delegation, March 19 2021
North Okanagan (Regional District)	Meeting, January 6 2021
Okanagan-Similkameen (Regional District)	(no response)
Peace River (Regional District)	(no response)
qathet (Regional District) (Powell River)	Meeting, March 11 2021 Delegation, April 15 2021
Squamish-Lillooet (Regional District)	(no response)
Strathcona (Regional District)	(no response)
Sunshine Coast (Regional District)	Meeting pending
Thompson-Nicola (Regional District)	(no response)

APPENDIX D - BC EXTENSION SCAN

Questionnaire

1. Can you tell me about the mandate of your organization? What is your role? (If not known)
2. My next question is about the extension you provide. What I mean by agricultural extension are informal education programs that help farmers apply new knowledge or tools to address challenges, either to help individual farms or across an entire sector.

Based on that description, could you please list the agricultural extension services that you provide that are relevant to the organic sector in BC?

Prompts: What topics are covered? Who are the target audiences? What is your geographic reach? Is there a cost to participants? Are the programs integrated into a larger comprehensive objective/ strategy, or is it more one-off? What media formats do you use (e.g. print resources, online resources, podcasts, video)?

3. Can you think of anyone in your network who also provides extension services for the organic sector in BC, that we can contact for this study?
4. For the next phase of our project, we will be looking for organizations to collaborate with on developing the extension service. Would you like us to contact you about the next phase?
5. Our final report may include a list of the extension organizations that participated. May we include the name of your organization on that list?
6. Is there anything else you wanted to say that you haven't yet said?

Extension providers identified as potential collaborators

The following organizations/individuals were interviewed and expressed varying levels of interest in a collaborative, coordinated organic extension service. Meetings were held to ascertain readiness and interest in collaborating on organic extension.

Organization and Contact(s)	Extension Activities
Thompson Rivers University Applied Sustainable Ranching Program	• Workshops/Webinars • Farm Tours • Soils Conference
UBC Centre for Sustainable Food Systems	• UBC Farm seed programs: Trials, field days, workshops, online outreach • Diversified Agroecosystems Research Cluster: Presentations, field days, briefs • Feeding Growth: Workshops, events • Food literacy outreach program: Workshops, webinars • BC Food Web: Website, research briefs • Advising (ad hoc)
UBC Sustainable Agricultural Landscapes Lab	• Trials • Workshops/Webinars • Research briefs • Advising (ad hoc)

University of the Fraser Valley	• Trials • Presentations • No formal extension mechanism through UFV
University of Northern BC	• Workshops • Field days • Presentations • Advising (ad hoc)
KPU Sustainable Agriculture Department	• Seed lab: General outreach • Garden City Lands: Trials, workshops, demonstrations, tours • Cranberry extension (not organic)
KPU Institute for Sustainable Food Systems	• Farm schools • Workshops/webinars • Advising (ad hoc)
Farm Folk City Folk	• BC Seed Security: Events, demonstrations, tours, webinars • Public education events and online campaigns • Online tools and resources
Young Agrarians	• Website • Workshops, webinars, farm tours • Mentorship program • Publications • Land matching
NEAT Northern Co-Hort	• Workshops, webinars • Networking • Farm visits • Eco Farm Skills (similar to internship)
Kootenay Boundary Farm Advisors	• Advising • Workshops, webinars, farm tours, field days
Chris Bodnar, consultant	• Consulting services around farm business management
Climate and Agriculture Initiative	• Farm Adaptation Innovator Program: demonstrations, fact sheets, workbooks, workshops, field days
First Nations Agriculture Association of BC	• Business and farm production supports for indigenous farmers • Not organic specific but majority of participants are interested in organic/regenerative

Other providers of extension / agricultural support

The following is an *extensive but not comprehensive* list of providers of extension and other agricultural support, generated through the snowball method (referrals) or internet searches. Most of these organizations are not organic-specific. Information about extension activities offered was gleaned from organization websites when available.

Organization	Type	Extension Activities
Agriculture and Agri-Food Canada	Public	Research scientists: applied research, workshops, presentations Knowledge transfer officers: workshops, events, publications Not organic specific but some notable organic projects (e.g. wireworm research)
Columbia Basin - Agricultural Business Advisors Program	Public	Business advising
Community Futures programs (local/regional)	Public	Business support, some funding
Plant Health Lab @ AFF	Public	Diagnosis of plant health problems caused by insects and disease
Regional Agrologists @ AFF	Public	High level support, may organize extension activities, not organic specific
Western Economic Diversification Canada	Public	For processors and food businesses
Dan Weary, UBC Animal Welfare Program (Dairy)	Post-secondary	Organic dairy is fairly well supported in comparison to other sectors
David Connell, UNBC	Post-secondary	Economics and land use
Joanne Taylor, UBC O	Post-secondary	Food security and food sovereignty
John Volpe, UVIC Ecogastronomy	Post-secondary	Interested in extension in the future
Juli Carrillo, UBC Biodiversity Research Centre	Post-secondary	
Lenore Newman, UFV Food and Ag Institute	Post-secondary	Interested in extension generally
Mary Stockdale, UBC O	Post-secondary	Regional food systems, sustainable transportation, transition town initiatives and climate change awareness.
North Island College – Small Scale Market Garden and Sustainable Farming courses	Post-secondary	Continuing studies programs
Simone Castellarin, UBC Okanagan	Post-secondary	Grapes and vineyards, not organic specific
Sorin Pasca, College of New Caledonia	Post-secondary	Not organic specific, some work on season extension
Bella Coola Valley Sustainable Agriculture Society	NGO	Food security, educational events around sustainable agriculture

Bulkley Valley Research Centre	NGO	Sustainable resource management, broadly
Cariboo Agricultural Research Alliance	NGO	Not organic specific
Community Connections Revelstoke Society	NGO	Food security
Delta Farmland and Wildlife Trust	NGO	Wildlife habitat preservation
Futurpreneur	NGO	Business supports, more for processors / food manufacturing
Langley Environmental Partners Society	NGO	Riparian protection, skill building
Langley Small Farm Network	NGO	Farmer to farmer network
Langley Sustainable Agriculture Foundation	NGO	Ecological Services Initiative (riparian area focused)
Lift Community Services - Food Security Project	NGO	Food security focused org in Powell River
OUR Ecovillage	NGO	Permaculture
Skeena Watershed Conservation Society	NGO	Willing to be a supporter
Small Business BC	NGO	For Processors and food businesses
South Cariboo Sustainability Society	NGO	Public education, gardening
South Okanagan Similkameen Conservation Program	NGO	Invasive species management, links and referrals to sustainable agriculture resources
Society Promoting Environmental Conservation	NGO	Farmland Ecosystem Services Project: Seminar, soil testing, workshops, pest diagnosis/advice
The Root at Salt Spring Island	NGO	Hub for local food education and initiatives, owned and operated by the Salt Spring Island Farmland Trust.
Upper Skeena Development Centre, Senden Sustainable Agriculture Resource Centre	NGO	Regional NGO in Hazelton
Women's Enterprise Centre	NGO	Entrepreneurship for women (incl food businesses)
ARDCorp	Industry NGO	Environmental Farm Plan
BC Food Processors Association	Industry NGO	Not organic specific

Commodity associations e.g. BC Blueberry Council, BC Cranberry Growers' Association, BC Forage Council, Cattlemens Association (multiple)	Industry NGO	Vary in capacity to provide extension to members; not organic specific
Farmers Institutes (multiple)	Industry NGO	Vary in capacity to provide farmer-to-farmer support
Farmwest	Industry NGO	Developed by Pacific Field Corn Association
LMHIA Horticultural Growers Short Course	Industry NGO	Annual short course includes organic
Peace Region Forage Seed Association	Industry NGO	Extension for forage seed in Peace region
Peace River Forage Association	Industry NGO	Extension for forage in Peace region
Small Scale Food Processors Association	Industry NGO	Not organic specific
Investment Agriculture Foundation	Funder	
ES CropConsult	Consultant	IPM
Hatchet and Seed	Consultant	Permaculture
Megan D'Arcy, D'arcy Consulting	Consultant	Wildlife ecology and agriculture, based in Telkwa
Molly Thurston, Pearl Agricultural Consulting	Consultant	Tree fruit focus, has organic services
Tamara Richardson, Cornucopia Crop Consulting	Consultant	IPM, Fruit and vegetable production, has organic services

APPENDIX E - GLOBAL EXTENSION SCAN

See separate Word document and Excel spreadsheet for detailed extension scan data.

Organic extension models compared by funding source and service provider

SERVICE DELIVERY	FUNDING		
	Public	Mix	Private
Public sector	**Andalucia** - gov. organic advisory service and research centre **Switzerland** - cantons' organic advisory service		
Public-private collaborations	**Bavaria** - organic specialist centres and network consulting	**Quebec** - advisory network **Saskatchewan** - applied research and extension network	
Industry or farmer-based organizations		**France** – local and regional organic farmer groups; inter-professional associations **Denmark** – industry research institute **Ontario** – EFAO **UK** – on-farm research trial network	**Denmark** – farmer-owned advising companies **Netherlands** – organic value chain network **UK** – organic info service
Post-secondary or private non-profit research institute	**USA** – SARE nationwide funding and education program	**Switzerland** – FiBL **England** – Organic Research Centre **France** – ITAB **Quebec** – INAB	