

BC'S ORGANIC RESEARCH NEEDS REPORT - 2016

PREPARED FOR THE COABC

ROCHELLE EISEN

Resilient
SOLUTIONS
CONSULTING

This project is supported by *Growing Forward 2*, a federal-provincial-territorial initiative.

Background:

To facilitate federal and provincial researchers undertaking projects that would support organic production in BC, an updated research needs summary list has been developed. This summary identifies the agronomic barriers and challenges currently limiting organic certification and organic production in British Columbia as of Oct 2016. Outcomes from these projects could help optimize productivity, improve animal health and welfare, increase and diversify organic production, and improve the competitiveness of organic systems across the province and beyond. There is also a need to demonstrate organic practices are based on sound science and there is research behind the standards.

Methodology:

Electronic communication, phone calls and face to face interactions were solicited across the province across commodities and of all scales, large through small. Key producers, consultants and researchers were contacted directly. As of Nov 17, forty individuals / associations contributed via email or phone conversations and forty-one people through face-to-face communications. The majority of those who participated were either exclusively crop or livestock producers; but a percentage produced both. A handful of organic consultants and researchers also submitted suggestions. *Click [here](#) for the list of phone and email contributors.*

2016 list:Crop

- [Individual Horticultural Crops](#)
- [Pests / Diseases](#)
- [Greenhouse \(Container systems\)](#)
- [Weeds](#)
- [Irrigation](#)
- [Post Harvest](#)
- [Soil / Mulch](#)
- [Crop Nutrition / Yields](#)
- [Alternative Crops / Season Extension](#)
- [Climate](#)
- [Energy / Energy Efficiencies](#)
- [Best Practices](#)
- [Seed Production](#)
- [Human Nutrition](#)
- [Training Requests](#)
- [Non-Agronomic Requests](#)

Livestock

- [Beef / Dairy /Pork](#)
- [Poultry](#)
- [Feed](#)
- [Forage Production](#)
- [Aquaponics](#)

Preparation

- [Cleaning / Sanitation](#)
- [Raw Milk](#)

Historical lists – previous collected research topics:[2003 Crops](#)[2008 Crop](#)[2003 Livestock](#)[2008 Livestock](#)

2016 CROP

INDIVIDUAL HORTICULTURAL CROPS

- Alliums
 - Thrips management
- Bean
 - Botrytis
 - Seed corn maggot
- Blueberry
 - Establishing a phenology-based mummyberry management protocol for BC. (*e.g. When to rake or mulch? When to apply Surround?*)
 - Nutrient management for blueberries through fertigation (liquid fertilizer injection). (*Weed management through landscape fabric makes it challenging to apply coarse mineral and compost. Nutrient management through fertigation is an option that we should explore more in this context. This can be applicable to other perennial crops using landscape fabric as a way to keep the weeds down.*)
 - A lack of overall research supporting organic blueberry production in the Lower Mainland
- Brassicas (North Okanagan, Cariboo, Lower Mainland)
 - Flea beetle in brassicas and all greens
 - Thrips management
 - Aphids
 - Caterpillars
 - Cabbage root maggot
- Carrots
 - Root Knot Nematode (Lower Mainland)
 - Carrot rust fly management (Terrace, Prince George, Dunster, Enderby)
 - Weed control
- Corn (forage and sweet)
 - Pest management (overall strategy as very little organic sweet corn is being produced in the Lower Mainland)
 - Seed corn maggot
 - Corn root worm
- Cranberries
 - Weed control
 - Fireworm / tipworm
- Cucumbers
 - Pollination challenges
- Garlic
 - Developing protocols for garlic seed management to minimize disease, pest issues (modeled around clean seed certification)
 - A white rot biosecurity plan for organic farms (esp Vancouver Island)
 - Is white rot transferrable on non-host species (e.g. rhubarb crown, dahlia tubers) if grown in infected soil? If yes, what is the treatment protocol to kill the white rot spores without destroying the tuber? This research would be helpful for farms with white rot to minimize its spread on other planting material.
- Peas
 - Aphids – could Neem work?
 - Seed corn maggot
- Potatoes
 - Thrips management
 - Tuber flea beetles on potatoes (North Okanagan and Lower Mainland)
 - Potato IPM strategies: cutworm is an example of a pest that is not a constant problem, but can be an issue if allowed to overwinter and build up in numbers.
 - Late blight and other fungal pathogens. Designing alternative systems that reduce the dependency on copper.
 - Pest management (potatoes) – products developed that are economical and produced locally (i.e. entomopathogen work at KPU)
 - Potatoes: Adaptation to rising sea levels, soil salinity, shorter growing seasons in the Delta area.
 - Potato crop rotations – alternatives etc. Need to demonstrate improvements in yields and soil health, reduction in pest pressure.
 - Need to establish the net benefits of covercropping as a nutrient input option in potato systems. Need to learn more about varietal responses; (i.e. effects on skin colour; yield, quality, and skin set)h. Need

to demonstrate sufficient improvements in soil structure, effect on disease pressure etc –

- Tomato
 - Uneven ripening of tomatoes in tunnels producing green hard shoulders in various tomato types. (Worse to least: beefsteak, roma and cherry)
 - Evaluation/variety trial of fungal disease resistant varieties of tomatoes for tunnels/hoop house production in coastal area. (*Tomatoes are challenged in our high fungal disease region (Lower Mainland) and a thorough variety trial would be desirable.*)
- Tree Fruit
 - Development of compliant Plant Growth Regulators (Okanagan)

PESTS / DISEASES

- Working with border crop. Attracting and retaining beneficial predators in various crops to address an assortment of pests and pollination needs. For example peas /aphids, potatoes /aphids, blueberry /aphids and to supply pollination services, and cranberries / fireworm, tipworm. (*Such research is expensive and challenging to create replicated plots due to the open nature of the settings.*)
- Coastal BC – fungal diseases (club root, blights, molds, and mildews) for a wide diversity of crops
- Grasshopper treatment/management of hay in Cariboo
- Increasing the use of competitive exclusion (probiotics) technologies in organic production to reduce disease
- Symphylans (*pseudocentipedes*) – What crops and which situations are most affected, what seasons are the most difficult. Any methods for control or lessening damage. (*They thrive on organic matter and thus in soils with high organic matter. They seem to be uniquely problematic to organic production in the Pacific Northwest. As such, there is little motivation for much research to be done – they don't impact enough people*)
- Wireworm management / protocol for Vancouver Island (*Things to look at: At what soil moisture level do wireworms begin migrating lower down in the soil? When does mating occur and would pheromone traps at that time be able to bring #s down? When to apply Todd's newly developed fungal control (or when is it too late? Needs to be before mating?) Brown/yellow mustard cover crop before a potato crop? How effective are nematodes and at what concentration?*)
- Compare annual-biennial-perennial cover cropping systems as a means of addressing pest pressure (e.g. wireworm) and nutrient cycling.
- Identify cover crop cultivars and/or mixes that are effective for pest control (e.g. cabbage root maggot) in vegetables systems.
- Spotted Wing Drosophila
 - Organic management for Spotted Wing Drosophila (Okanagan)
 - Reducing the dependency on Entrust – the only SWD tool in the toolbox.
 - Locally adapted berry cultivars with firmer fruit, less susceptible to fruit rot and root rot diseases (all berry crops). [Lower mainland / Vancouver Isl]
 - Insecticides (alternatives to Entrust), cultural tools and biological controls for Spotted Wing Drosophila (blueberry, raspberry, strawberry, blackberry crops). [Inadequate pest management options and poorly-adapted cultivars limit the opportunities for producing high quality organic berries in the Fraser Valley and on Vancouver Island]
- Club root – more specific research and management info.
- Any chemical or 4beneficial and how-to information on aphids and caterpillars on all crops grown in hoop houses during cool springs (Lower Mainland). (*Don't want to apply Dipel every week or Entrust, especially with the 3 day PHI. The challenge is the farm's most lucrative crops are overwintering brassicas which end up serving as aphid refuges – and therefore cannot break the cycle. Need more management tools / solutions.*)
- Management of root crop storage problems
- Organically approved fungicides for fruit rot prevention (all berry crops) (Province wide)
- Designing crop rotations where the crop choices are limited because of pest pressures on various crops.
- Alternatives for Entrust and copper.
- Biological controls – do they work? How to test their effectiveness?
- Apple maggot (Okanagan)
- Maple / boxelder bug on buildings
- Efficacy of pheromone baited trapping systems on vole populations. (The bait is a mix of organic foods with semiochemical and pheromone attractants dispersed passively. This bait will be inside a trap box armed with a snap trap)
- Identify innovations (products) and techniques to reduce soil borne pathogens especially in orchard replant systems. (e.g. alternatives to non-GE brassica meal. Current supply is cost prohibitive)

GREENHOUSE (Container systems)

- Millipede (causes scarring on cucumbers) and Earwigs (scarring on cucumbers) and ruining peppers (use them for breeding locations). *(Have tried DE, and Tanglefoot with no success. And when millipede population is high the earwig population is low and vice versa. Also thinks earwigs have a negative impact on worm population)*
- Carbon footprint / energy study. Comparison of energy (electricity and gas) use (per sq/m) of an organic farm vs a non-organic farm

WEEDS

- Weed control specifically in grain production.
- Weed control in perennial crops (what are the considerations for establishment and crop maintenance stages) – cultural management strategies, IPM solutions. Crops top of mind: lavender, asparagus, rhubarb, berries.
- Canada thistle control in pasture.
- Weed management – specifically methods which do not promote excessive tillage.
- Orchard weed management on small-scale orchards. *(Exploring livestock grazing options and mulching.)*
- Trial of paper mulch as an alternative to biodegradable/plastic mulch for coastal regions. *(Evaluating how fast it breaks down, the cost and the practicality of this material in replacement to plastic mulch.)*
- Determine the species of the new weeds in the eastern Fraser Valley (along Hwy 1); where they are coming from; and some options for eliminating them. *[Proponent speculates that they are wild radish, canola, and mustard and possibly other brassicas. Proponent also mentioned that some seem to be glyphosate-resistant; and also they suspect the weed seeds are arriving via chicken and dairy manure.]*
- Organic management of invasive weeds in agricultural systems and road right ways – Japanese Knotweed, Himalayan Balsam, bindweed, yellow nutsedge, purple loosestrife
- Chickweed – need to know the best winter cover cropping to reduce chickweed overwinter or in general best covercrop to smother winter weeds. We can't get on fields till late April (Lower Mainland) and some overwintering weeds have gone to seed before we can get on the land.

IRRIGATION

- Irrigation water quality management options for organics – alternative compliant water treatments

POST HARVEST

- Development of post harvest treatments for tree fruit (to address post harvest challenges/diseases)
- Investigating the efficacy of electrolyzed water solutions as cleaning agents – on farm and in preparation facilities.
- Crop stress/nutrient load – how to correlate to post harvest life/decay. For example in beets

SOIL / MULCH

- What is happening to the soil biota during occultation (black plastic)?
- What are the long term-impacts on soil health of using occultation (black plastic) and solarisation (clear plastic) as weed-suppression techniques? These are suggested in a lot of small-scale growing guides (JM Fortier, for example). Are there risks to using these techniques?
- Mulching practices for slug prone regions
- Overcoming clubroot and white rot through soil building / management (Vancouver Island)
- Effective overwintering crop rotation plans without brassicas
- Water management on fast draining sandy soil (organic matter building and management, undersowing practices, mulching, etc). *Important for those producing on sandy soils given the increasing drought years.*
- What are the long-term effects of using compost produced from pre- and post-consumer green waste? *(For example Net Zero Waste compost? Enterra? It's great – no weed seeds, consistent product, but it also has a lot of plastic bits. Plus, what other risks are there from prolonged use? Can these be mitigated or are they a problem?)*
- Develop and compare efficacy of fermentation techniques with aerobic and thermophilic composting methods.
- Plastic mulches – do the residues get into the food chain? Are residues harmful to the environment? Are there better options in terms of products that are more suitable for organics? Does a threshold for the above need to be established to keep these mulching products accessible to organics?
- What are the replacement options in terms of management/tools for “biodegradable” mulches?
- Biodegradable plastic or paper instead of plastic mulch that can be mechanically applied. *(We have clay soils and pulling up poly in the fall is a huge chore).*
- Develop best practices and compare better equipment (e.g. roller crimper)/techniques for main season cover cropping systems in vegetables.

CROP NUTRITION / YIELDS

- Fertility inputs for organic hay production in the Cariboo. What is optimal for meeting nutrient requirements? Is there anything new out there that should be looked at?
- How to establish exactly plants nutrient demands especially for nitrogen and what are the best source of N with consideration to economics and %N.
- Overcoming the slow buildup of P & K in soils when manure is applied regularly.
- Solutions for using (municipal) sewage waste in organic farming.
- Using greenwood clippings as a source of potassium – from municipal or private sources.
- What are cost effective sources of organic N specific to Hops? (*keeping in mind the narrow 6 week for uptake and the demand roughly being 50lbs N/acre in that window*)
- Farm scale production of EM culture
- Develop a decision-tree or infographic tool to guide practicality and/or necessity for inoculants (specific examples?) with cover cropping systems.
- Identify best management practices to address food safety and nutrient cycling in integrated farming systems with annual and perennial crops and livestock.
- Biggest obstacle to remaining competitive, especially against conventional producers, is obtaining comparable yields. *To read the entire “biggest obstacle” submission click [here](#).*

ALTERNATIVE CROPS / SEASON EXTENSION

- Hops, sweet potato, okra – what are the opportunities for organics in BC? What are the management considerations for organics?
- Specialty crops for marginal soils and growing regions.
- What is the potential for kiwi production in BC? Pomegranates? Sweet Potatoes?
- On-farm tissue culturing for crops that are difficult to import quality specimens (sweet potatoes, turmeric, ginger, wasabi)?
- Opportunities for farming the shoulder seasons – (management, variety development, cultural considerations, equipment options *etc.*)

CLIMATE

- A climate adaptation plan for BC organic farms. (*Critical considering the weather extremes experienced around the province the last few years*)
- Potatoes: Adaptation to rising sea levels, soil salinity, shorter growing seasons.
- Increasing the quality of local seed and grain production.
- Increasing the carbon sequestration on organic farms.
- Optimizing conditions/environments for pollinators.
- Increasing thrips population in the Lower Mainland as temperatures rise. Noted on potatoes, cabbage, squash, strawberries and flowers.

ENERGY / ENERGY EFFICIENCIES

- Reducing energy use on the farm – and alternate energy systems
- Reducing environmental impact of food production systems
 - Packaging reductions and alternatives
 - Small scale energy generation / trapping on-farm (heat energy from compost, other waste).
 - Using SMART technologies to reduce waste, increase efficiencies in-field and around the farm.
 - Cost effective ways to recycle water for food safe reuse
 - Is aquaponics part of energy / waste solution?

BEST PRACTICES

- Farm scale – best practices with water storage, drainage, and nutrient dynamics at a regional scale (e.g. ideal systems based on soil type, landscape form, regional climate and micro-climates as well as identification of livestock breeds most ideally suited to regional soil and climate conditions.) [*The soil, climate, and market characteristics of my growing region (Vancouver Island) indicate that diversification on the farm, meaning a planned integration of horticulture and livestock, is a good general strategy for longterm farming success.*]
- Research focusing on best practices for integrating livestock with mixed vegetable crops, specifically aimed towards long-term soil health and accounting for nutrient and water management on the farm as a whole. [*** Shorter term, more narrowly focused projects aimed to address above could include research that evaluates efficacy of a range of regionally available soil amendment inputs and regionally reported soil management practices with the goals of boosting yield and maintaining soil health. Each year, at growers’ conferences in the context of my own soil nutrient management workshops, I field questions about efficacy of specific soil amendments and/or how to maximize benefits of cover cropping and crop rotations. While I would like to move*

away from any kind of product endorsement and the slippery slope of input substitution, an evaluation of the addition of off-farm soil amendments, stand-alone and in combination with specifically identified cover-cropping systems and/or livestock – crop rotations (e.g. which combo of cereals and legumes, seeded when and how, incorporated when and how; which livestock rotations where, how, when with horticultural crops), could help individual growers and grower organizations prioritize spending and make long term nutrient (and water) management plans.]

- Best practices for nutrient and water management with two broad goals of soil health and food safety.
- Increasing biodiversity as a means of reducing pest and disease pressure
- What are the best options for allowable building materials for movable tunnels?
- Building design. Best practices for energy saving and food safety

SEED PRODUCTION

- How to minimize pathogen loads on seed crops
- Seed sanitation methods. *The current use of peracetic acid is limiting as it is really the only sanitizer approved, very hard to find, and a challenge to work with.*
- Economics of seed production integrated into mixed vegetable operations (e.g. development of a Planning for Profit paper)
- Marketing options for growers – once they grow the seed what are their options for selling?
- Trial of seed production; identifying regional strength of seed production.
- Establishing regionally appropriate seed supply and varieties (e.g. broccoli for the Lower Mainland)
- Variety trials for emerging organic seed varieties

HUMAN NUTRITION

- Relationship between inputs, soil health and ultimate nutritional quality of fruit and vegetables. Likewise, feed types and resulting nutritional qualities of livestock products.

TRAINING REQUESTS

- Site specific soil agronomics. *To read the entire “site specific soil agronomics” submission click [here](#).*
- To help farmers improve their seed quality and bulk up production.
- To help farmers integrate breeding into their seed production efforts.
- Organic extension service including regional visits and support through workshops.
- Knowledge transfer of new innovation and inputs that help with organic production
- Consumer education on the benefits of local organics vs just local. Millennials in the Kootenays are rejecting organic as they believe local is better. Also millennials do not believe organic includes animal welfare requirements. There is so much misinformation on organics that consumers are glomming onto.
- I would add producer education on organic standard. With all the changes, some producers seem to have a hard time to follow up with the standard. Also, many producers that have been in the program for a while could use a refresher. Many small-scale farmers are isolated and are a little disconnected. Without the follow up, I'm afraid we'll start losing small-scale producers. I would also add that it would be great to have non-organic producer education on the value of being organic.

NON-AGRONOMIC REQUESTS

- Land and water access are major barriers to all agriculture for coastal BC
- Do pre-harvest applications of glyphosate on wheat contribute to so-called gluten intolerance?
- How to motivate and educate more conventional farmers to transition to organic growing.
- How to keep the certified organic message strong, supporting Bill 11.

2016 LIVESTOCK

Beef / Dairy / Pork

- Horn fly management in beef herds
- Medical ozone (intramammary for mastitis). Would it be allowed under COR? Would a withdrawal period be required? If yes, how long?
- Is nitric oxide an efficacious method of dealing with udder infection? Would nitric oxide be allowed under COR? Would a withdrawal period be required? If yes, how long?
- When, what, how and why dairy cows select to go outside/inside?
- What topical creams or salves are effective against udder infections?
- Scoring organic dairy animals for knees and hock condition (swelling or abrasions), gait and cleanliness
- Impacts of organic, management-intensive grazing systems on soil and ecosystem health as compared to conventional continuous-grazing programs.
- Better housing designs for pigs that apply to large scale organic production. For example a design with free range area for pigs that can be used year round or in combination with covered area for winter use, impacts of design on health & welfare, parasite control, productivity
- More research around non-chemical parasite controls. Those of us who use diatomaceous earth, for example, know it works. A student in the KPU Sustainable Agriculture program did a research project on this last year demonstrating that it works. Yet there is very little research that backs this up to give alternative non-chemical controls any credibility. And, as a result, there is little known about proper dosage or long-term health impacts. Other items we use for which there is little research: garlic, pumpkin seeds, wormwood, vinegar, rosemary . . . and the list could go on.
- Identification of stress indicator for organic piglets. Are they the same or different than non-organic piglets? Does it vary with production system? Scale? Does it vary with breed?
- Development of specialized vaccines. *(To deal with site specific diseases / strains e.g. pink-eye)*

Poultry

- How to reduce mortality rates in day old to 7 day old chicks *(Operation not experiencing significant losses after that)*
- How to reduce mortality rates in 17 – 26 day meat birds *(Operation not experiencing significant losses up to this window)*
- Feeding fish meal to reduce costs and increase weight gains. Would also eliminate the need for methionine supplementation. *(Should fishmeal be restricted to the first 3 weeks? What proportion of the feed can be fishmeal and have no impact on smell/taste at different stages throughout the life of a broiler? How to identify organic compliant sources of fish meal?)*
- Are premixes necessary if birds have access to range? *(how much of the nutritional needs of the birds can be secured from range eliminating the need for supplementation?)*
- Broadening the poultry gene pool to increase immunity
- Assessing alternative breeds for organic systems
- What are ideal flock sizes (layers, meat and breeds) that allow for natural behaviours? Reduce cannibalism?
- Better housing designs for poultry that apply to large scale organic production. – and identifying impacts of design on health & welfare, parasite control, productivity
- Conversion efficacies. Does a slower growing bird (like the Redbro, Freedom Ranger, Sasso, Cobbsasso) eat less overtime than the Cornish X at 40 days?
- At what outdoor temperature / relative humidity should birds be kept indoors? At what age? Layers vs Meat birds? Per breed? *(challenging the 2 degree difference position – when it is 2 degrees cooler inside than out birds should not have to go outside).*
- More research around non-chemical parasite controls.
- Identification of stress indicator for organic poultry. Are they the same or different than non-organic birds? Does it vary with production system? Scale? Does it vary with breed?
- Addressing the lack of slaughter capacity & willingness for existing abattoirs to meet organic requirements?

Feed

- Explore alternative feed concentrates for ruminants and monogastrics.
- Designing nutrition-rich poultry feeds containing minimal grains /legumes /seeds – from grains/legumes that could be grown produced in coastal BC particularly reducing prairie and offshore imports.
- How to finish pork (Berkshires) with cost effective weight gains and ample marbling without or reduced grain. *(Cost of grain transport to the Cariboo is putting organic pork at severe price disadvantage).*
- Identifying alternatives sources of protein & energy, insects as a food source for example. What are the effects on egg quality, voluntary intake etc

- Raising organic insects for feed (small scale, large scale)
- Creating balanced feeds with organic insects.
- Designing efficient, cost effective small scale sprouting facilities for various livestock operations.
- Should organic be shifting its feeding regime to better balance the Omega 6/Omega 3 ratios?

Forage Production

- Improving forage production through increasing diversity in the pasture, trialing new forage varieties, managing grazing impact and extending the grazing season, improving irrigation efficiency and the like.
- Fertility inputs for organic hay and grain production in the Cariboo. What is optimal for meeting nutrient requirements? Is there anything new out there that should be looked at?
- Plants for the pasture especially for small ruminants to act as anti or de-wormers. *(There was a presentation at Guelph last year by someone who had done a bit of research on multispecies plantings, but I think we need more work.)*

Aquaponics

- Designing organic aquaponic systems
- Phosphorus limitations in organic aquaponic systems
- Using bioregional and in-house sustainable, renewable resources to develop and manufacture floating feed pellets with optimal nutritional value for fish and plants in an aquaponics system.

2016 PREPARATION

Cleaning / Sanitation

- Listeria control in organic preparation facilities. Examining sources of listeria found in preparation facilities. Is it coming from the farm?
- Investigating the efficacy of electrolyzed water solutions as cleaning agents – on farm and in preparation facilities.

Raw Milk

- What is the micro-biological safety of raw milk produced from legitimate herdshares who follow Raw Milk Institute's (RAWMI) standards?
- What is the consumer demand in BC for organic, grass-fed raw milk?
- What are the economic and biological impacts of RAWMI training on milk safety?

New opportunities

- Yukon organic crops - possible sources of alternative non-carcinogenic curing nitrates
- A comparison of glucosinolates and goitrogens ratios in raw, cooked and fermented organic cruciferae

| 2008 Crops | 2008 Livestock |
|---|--|
| <ul style="list-style-type: none"> • Soil quality • Biodiversity • Enhancing natural insect controls Soil fertility and crop rotations Pesticide reduction • Ecological interactions in rotations • Beneficial rotations for specific problems • Cultural disease controls Enhancing natural disease controls | <ul style="list-style-type: none"> • Livestock feed • Livestock breeds |

| 2003 Crops | 2003 Livestock |
|--|--|
| <ul style="list-style-type: none"> • Soil fertility & management; covercropping • Pest management • Seed availability • Nutrient management; compost tea | <ul style="list-style-type: none"> • Livestock nutrition management |

LIST OF PHONE AND EMAIL CONTRIBUTORS (2016)

| Name | Profile | Op'tn Scale | Production Type | Locale |
|--------------------------|-----------------------|--------------------|--------------------------------|------------------|
| Anne Macey | consultant | N/A | Livestock | BC |
| Arzeena Hamir | producer | Medium | Crop / Livestock | Vancouver Island |
| BC Herdshare Association | producer | Small | Livestock / Preparation | BC |
| Carmen Wakeling | producer | Large | Crop / Sprouts | Vancouver Island |
| Carolyn Teasdale | provincial agrologist | N/A | Crop | Lower Mainland |
| Chris Bodnar | producer | Medium | Crop / Livestock | Lower Mainland |
| Chris Thoreau | producer | Medium | Sprouts / Seeds | Lower Mainland |
| Corey Brown | producer | Medium | Crop / Livestock | Okanagan |
| David Janssens | producer | Large | Livestock / Forage | Lower Mainland |
| DeLisa Lewis | producer | Small | Crop / Livestock | Vancouver Island |
| Elana Varner | consultant | N/A | Crop / Livestock | BC |
| Elmarie Roberts | producer | Small | Crop | Vancouver Island |
| Evelyn Pereira | producer | Medium | Crop / Livestock | Vancouver Island |
| Gabe Cipes | producer | Large | Aquaponics / Crops | BC / Okanagan |
| Hermann Bruns | producer | Medium | Crop | Okanagan |
| Jack McLeod | producer | Medium | Livestock / Forage | Okanagan |
| Jim Grieshaber-Otto | producer | Medium | Crop / Livestock | Lower Mainland |
| Joan Wilkinson | producer | Medium | Livestock / Forage | Vancouver Island |
| Joanne Jackson Johnson | producer | Small | Crop / Livestock / Preparation | Yukon |
| Joanne Warren | producer | Small | Crop | Thompson |
| John Stevenson | provincial agrologist | N/A | All | Cariboo |
| Jordan Marr | producer | Small | Crop | Okanagan |
| Kiara Jack | consultant | N/A | Crop | Lower Mainland |
| Keith Hammond | producer | Large | Greenhouse | Lower Mainland |
| Lydia Ryall | producer | Medium | Crop | Lower Mainland |
| Marlene Thimer | producer | Medium | Livestock / Forage | Cariboo |
| Mel Sylvestre | producer | Small | Crop / Livestock | Lower Mainland |
| Molly Thurston | producer | Medium | Crop | Okanagan |
| Niki Strutynski | producer | Small | Crop | Vancouver Island |
| Paddy Doherty | producer | Medium | Crop | Okanagan |
| Renee Prasad | consultant | N/A | Crop | Lower Mainland |
| Robert Hettler | producer | Medium | Crop | Okanagan |
| Robin Sturley | producer | Small | Crop / Livestock | Vancouver Island |
| Sam Quinlan | producer / consultant | Medium | Crop | Thompson |
| Sara Dent | consultant | N/A | Greenhouse | BC |
| Shaun Fairbairn | consultant | N/A | Livestock | BC |
| Tamara Smith | producer | Small | Livestock | Kootenays |
| Tara Moreau | researcher | N/A | Policy | BC |

This project is supported by the Strategic Outreach Initiative - *Growing Forward 2*, a federal-provincial-territorial initiative.

Biggest Obstacle submission (2016)

Here is a problem I think research may be able to address as a priority.

I have found that one of the biggest obstacles to remaining competitive, especially against conventional producers, is obtaining comparable yields.

At the end of the day, yields are most closely linked with fertilizer inputs. And this is especially true for the hop industry, whose plants have an insatiable appetite for nitrogen.

Organic producers are often particularly challenged by logistical aspects of fertilizers, such as:

- sourcing issues (where do I get the most cost-effective fertilizers?)
- consistency issues (can I rely on getting the preferred fertilizers from year to year?)
- concentration issues (how do I get all that nitrogen onto my fields? There's only so much compost you can apply).

No amount of green manure and cover crop management can make up for the high nutrient demands by many plants. They must receive additional nutrients beyond the compost that many producers already make use of on-farm (but never have enough of...).

I think there needs to be a 21st century approach to solving the universal issue faced by every organic producer - nutrient and fertilizer supply and management. And I think that applied research would be able to address this need.

For example, shipping old composted manure from a dairy operation to the local market garden to top dress their fields in the spring is not a 21st century solution. BC as a region needs to better assess the potential organic feed stocks available to them, find ways to process them more centrally, and offer these value-added fertilizers to farms in need of reliable, local, and cost-effective solutions to nutrient management.

Without a renewed approach to nutrient management, organic producers will continue to limit their production systems to below attainable levels and, as a result, limit their competitiveness against conventional farms and the broader market.

Site specific agronomics submission (2016)

1) What agronomic research is needed to support the evolution and growth of the BC organic horticulture and livestock sector

- a) on your farm: How can I learn more about my farm-specific soils and what soil preparation and fertility management methods would best suit them, eg. general guidelines according to soil type, as well as more specific case studies in organic ag systems, including amendments, machinery selection, crop rotations, cover crop selection and timing, rotation with livestock grazing etc. These may be clay-rich soils, or sandier soils, or silty soils, sometimes multiple soil types exist on a single farm or even in a single field
- b) in your region? Same as above, keeping in mind that there is such a small amount of ideal agricultural soil on Vancouver Island, it is important to learn how to work effectively, sustainably and as productively as possible with more marginal soils (with land prices going steadily upwards, new farmers may not have the capital to obtain ideal agricultural soils).
- c) across the province? I'm sure other regions of this coastal and/or mountainous province have similar challenges working with less-than-ideal soil types.

2) Why is this project a priority? Since existing prime agricultural soils in BC are under threat by hydro dams, development/ urban sprawl, industry, etc, as well as becoming prohibitively expensive, we need to learn to maximize marginal soils through holistic management. The best resources I have been given (by a UBC soil science PhD) are a handful of Oregon State University documents on soil sample analysis, and a BC government soil survey document from the 60s. Not a lot to work with! A comprehensive, 'one-stop shop' soil management resource would be so incredibly valuable to small- and large-scale organic farmers in BC.

3) Do you have anything you would like to add or remove from the research needs already identified for BC (see page 2)? Do you have any comments on more specific issues? It looks like soil quality and management

were top of the list in both previous surveys, however I'm not sure what the outcome of the research was or how to access it. In any case it would seem that the results are not readily available to the public in an internet-based, searchable format, as I did not come across these documents in attempting to find information specific to BC or Vancouver Island. This would be the best use of the results in my opinion, as we do not have extension services in BC, the next best thing would be an easily searchable database of research publications pertaining to organic agriculture in BC and in language accessible to non-scientists.