



CLIMATE CHANGE ADAPTATION PROGRAM

Regional Strategies: Fraser Valley

2018 Update to Report

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Climate Action Initiative
BC AGRICULTURE & FOOD

Fraser Valley

Adaptation Strategies Update

BC Agriculture & Climate Change
Regional Adaptation Strategies

Funding for this project was provided by the Governments of British Columbia and Canada under *Growing Forward 2*, a federal-provincial-territorial initiative.



other project partners
BCAC/ARDCorp



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The BC Agriculture & Food Climate Action Initiative was established by the BC Agriculture Council in 2008, and is led by an advisory committee of agricultural producers, food processors and representatives from various government agencies. The Initiative has been supported by the Investment Agriculture Foundation of BC with funding provided by the Governments of British Columbia and Canada.

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Introduction

The *Fraser Valley Adaptation Strategies* plan was completed in 2015 and project implementation began in the summer of 2015 and concluded by the spring of 2018. Over the fall and winter of 2017/2018, the BC Agriculture and Food Climate Action Initiative (CAI) undertook a process to re-visit the strategies and actions that were identified as high priorities in the original plan, to assess progress in plan delivery and to determine areas of focus for the future. The intent of this process was not to repeat the original (and still relatively recent) comprehensive planning process, but rather to undertake an efficient and targeted update that reflects progress, and captures changes in context and priorities.

This document outlines the Strategies Update process objectives and methodology, describes implementation progress, and defines key actions and implementation priorities moving forward. The Strategies Update process had three overarching objectives:

- To review and reflect on progress in addressing priority actions from the *Fraser Valley Adaptation Strategies*;
- To identify highest priority areas in the plan that have not been addressed or require additional support; and
- To identify new or emerging adaptation priorities/projects.

Overview of Fraser Valley Adaptation Strategies

The original planning process took place in the Fraser Valley from the fall of 2014 to the spring of 2015, bringing together agricultural producers and specialists, along with local and provincial government representatives. Approximately 80 participants took part over the course of two workshops. A local advisory committee that

included representatives from the Fraser Valley Regional District, the District of Kent, the City of Abbotsford, the City of Chilliwack, the Village of Harrison Hot Springs, the District of Hope, the District of Mission, the BC Landscape and Nursery Association, the BC Poultry Association, the BC Young Farmers and Fraser Valley Direct Farm Marketing Association, the BC Dairy Association, the BC Blueberry Council, the BC Greenhouse Growers' Association and the BC Ministry of Agriculture, provided guidance and input throughout the process.

The resulting *Fraser Valley Adaptation Strategies* plan outlines the anticipated changes in climate and the associated agricultural impacts.¹ It also provides clear actions, suited to the specifics of the local context, both with respect to projected changes in climate and local capacity and resources. The plan includes 12 strategies and 28 actions for agriculture to adapt to five priority impact areas:

- 1) Warmer and drier summer conditions;
- 2) Increasing precipitation and extreme precipitation events;
- 3) Changing freshet flood risk;
- 4) Changes to pests² and pollinators; and
- 5) Greater frequency and intensity of extreme heat events.

Upon completion of the planning process, \$300,000 of *Growing Forward 2* funding was made available to implement collaborative projects identified in the plan. The advisory committee that was formed to guide the planning process transitioned into an oversight “working group” for development and delivery of projects. By the spring of 2018, six regional projects had been completed and funding had been fully committed.

¹ *The climate change projections and five impact areas are described in more detail in the Fraser Valley Adaptation Strategies available at:*

<https://www.bcagclimateaction.ca/wp/wp-content/media/RegionalStrategies-FraserValley.pdf>

² “Pests” refers to insects, weeds, diseases and invasive species with potential to negatively affect agricultural production.

Methodology

The process to review and update the *Fraser Valley Adaptation Strategies* included the following four steps:

- 1) Undertaking analysis of progress on strategies and actions;
- 2) Conducting meetings with local partners and the working group;
- 3) Holding an information gathering and prioritization workshop; and
- 4) Developing a draft document and circulating it for working group review prior to finalization.

Each of these steps is described in more detail below:

1) Progress analysis: CAI undertook a review of projects implemented to determine which strategies and actions from the *Fraser Valley Adaptation Strategies* plan have been completed (wholly or partially). This analysis also included a review of any recommendations for next steps or additional activities from completed projects to support further actions in priority areas.

2) Local partner and working group meetings: Preliminary meetings were held with staff from the Fraser Valley Regional District and the Ministry of Agriculture. These meetings helped to identify any changes in local context or organizational priorities. Specific meetings were not held with agricultural organizations in order to minimize CAI demands on their time. However, input was gathered from agriculture sector representatives throughout project implementation via project management committees, at project workshops, and at working group meetings, which took place during the time frame of this Update.

These consultations with a few project partners confirmed that undertaking a formal process to update the *Fraser Valley Adaptation Strategies* plan was both valuable and timely.

3) Prioritization workshop: A workshop was conducted to assess progress on the prioritized strategies and actions within the *Fraser Valley Adaptation Strategies* plan and to discuss preferred areas of focus for near-term implementation. The workshop was held on Thursday November 30th 2017 at the Fraser Valley Regional District building. Workshop participation was by invitation and there were 16 participants including Fraser Valley producers and other key partner groups/agencies with active knowledge of implementation activities in the region.

The workshop began with an overview of the Fraser Valley adaptation projects completed to date, as they relate to the climate change impacts and strategies within each of the five Impact Areas in the plan. Workshop participants then voted on the most important strategies within each Impact Area (see Appendix 1: voting card). When selecting priorities, participants were asked to take into consideration the following:

- The potential to build on momentum, activities or results of earlier work with next steps;
- The degree of urgency of the strategy; and
- The potential for linkage to related local initiatives and/or synergistic opportunities.

The results of the voting activity were tallied and workshop participants were divided into small groups to discuss the strategies that received the most votes. Participants discussed the actions associated with the top strategies, brainstormed possible additional actions, ranked and determined the top two actions, and then completed action planning based on prioritized actions. A workshop summary was provided back to all workshop participants.

Methodology continued

4) Draft development and completion:

Utilizing the workshop summary, the CAI team developed a draft Strategies Update document. This document was then shared back with the local

working group for feedback. Final adjustments and edits were completed, and the final Update was distributed back to workshop participants and project/program partners.

Summary of Progress to Date

This table provides a visual summary of progress made towards addressing the strategies in the *Fraser Valley Adaptation Strategies* plan. Additional details about projects can be found in the introductions to each strategy in the *Fraser Valley Adaptation Strategies Update* section (beginning on page 5). A table listing all strategies and actions, along with projects completed, is located in Appendix II.

Graphic representation of progress (2015-2018) within each strategy in the Fraser Valley Adaptation Strategies.

		<i>not started</i>	<i>partially addressed</i>	<i>fully addressed</i>
Strategy 1.1	Address critical information gaps to assist producers with water management decisions			
Strategy 1.2	Strengthen knowledge transfer of water management tools, technologies and resources			
Strategy 2.1	Develop a coordinated cross-agency approach to agricultural ditch and drainage management			
Strategy 2.2	Identify, pilot & evaluate mechanisms to reduce runoff onto & off agricultural lands			
Strategy 2.3	Develop adaptive & coordinated nutrient management strategies for the region			
Strategy 3.1	Increase awareness of flood risk & potential impacts to agriculture			
Strategy 3.2	Coordinate sector, commodity & individual producer flood risk responses & planning			
Strategy 4.1	Pilot a cooperative pest surveillance program for priority risks			
Strategy 4.2	Increase research and information transfer regarding pest life cycles, identification and management			
Strategy 4.3	Evaluate the impacts of weather conditions and management practices on pollinators and pollinator/crop interactions			
Strategy 5.1	Identify suitable approaches for minimizing impacts of extreme heat to product quality/health			
Strategy 5.2	Evaluate opportunities for addressing labour supply during periods of peak demand			

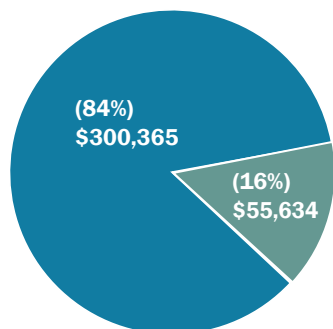
Investment in Fraser Valley Adaptation Projects: 2015 – 2018

The *Fraser Valley Adaptation Strategies* plan identifies 12 strategies and 28 actions to support agricultural adaptation to climate change through the development of (regionally relevant) tools and resources that enhance adaptive capacity. Over a three-year period **six regional projects** (and two farm adaptation innovator projects [FAIP]³) were undertaken to address the highest priorities identified in the *Fraser Valley Adaptation Strategies* plan. The regional projects were supported with \$300,365 of seed funding provided through *Growing Forward 2* and \$55,634 from contributing partners. The Farm Adaptation Innovator Projects (FAIP) projects were supported with \$281,476 of *Growing Forward 2* funding and \$80,600 in funding from other partners.

Investment in Fraser Valley Regional Adaptation Projects: 2015 – 2018

\$355,999
TOTAL REGIONAL ADAPTATION
PROJECT FUNDING

- Partner Funds
- *Growing Forward 2* Regional Adaptation Program



Program and Project Partners

Fraser Valley Regional District
 BC Blueberry Council
 BC Dairy Association
 BC Poultry Association
 BC Landscape and Nursery Association
 BC Ministry of Agriculture
 City of Chilliwack
 City of Abbotsford
 District of Kent
 Lower Mainland Horticulture Improvement Association

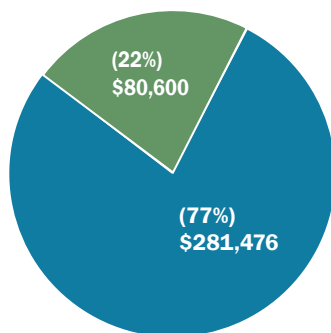
Regional Adaptation Funding Partners

BC Blueberry Council
 City of Abbotsford
 City of Chilliwack
 Fraser Valley Regional District
 Dairy Industry Research and Education Committee
 Lower Mainland Horticulture Improvement Association
 Raspberry Industry Development Council

Investment in Fraser Valley Farm Adaptation Innovator Projects: 2015 – 2018

\$362,076
TOTAL FARM
ADAPTATION INNOVATOR
PROJECT FUNDING

- Partner Funds
- *Growing Forward 2* Farm Adaptation Innovator Program



FAIP Project Leads

ES Crop Consult
 Pacific Field Corn Association

FAIP Funding Partners

BC Potato and Vegetable Growers' Association
 E.S. Cropconsult
 Lower Mainland Horticulture Improvement Association
 BC Dairy Association (DIREC)
 Pacific Field Corn Association

to date

\$718,075 INVESTED IN FRASER VALLEY ADAPTATION PROJECTS

³ The Farm Adaptation Innovator Program supports farm level projects that seek to demonstrate, and evaluate practices and technologies that may reduce weather related production risks and/or increase new production opportunities.

Fraser Valley Adaptation Strategies Update

The Strategies that have been identified as highest priority for near term implementation (through the process outlined in the Methodology) are highlighted in green text boxes. The seven prioritized actions (along with seven possible projects) developed and fleshed out through the workshop – and subsequent input received from the Fraser Valley Adaptation Working Group – are described under the relevant Strategy and highlighted in light blue text boxes.

Impact Area 1: Warmer and drier summer conditions

Strategy 1.1 [Not Prioritized] - Address critical information gaps to assist producers with water management decisions

Progress to Date

One project has been completed that addresses this strategy. The Fraser Valley Agricultural Water Symposium was held in November of 2016 to address information gaps and priorities identified by producers during the development of the *Fraser Valley Adaptation Strategies*.

Topics at the Symposium included future water supply, the provincial regulatory context (the Water Sustainability Act) and how to apply for a well license, irrigation and drainage management and how to use soil moisture sensors. Examples of local innovation in water management practices and technologies were showcased through producer presentations. Following the workshop, a fact sheet was created to further disseminate the topics and key resources shared through the session.

Although not prioritized at this time, future knowledge transfer events would be beneficial in reaching more producers, and covering additional or evolving (or more commodity specific) topics. Field based extension opportunities were of particular interest to Symposium participants for future water-related knowledge transfer.

Strategy 1.2 [Prioritized] - Strengthen knowledge transfer of water management tools, technologies and resources

Progress to Date

This strategy has been partially addressed through the Fraser Valley Agricultural Water Symposium (described above) and the FAIP project *Strategies to Improve Forage Yield and Quality while Adapting to Climate Change*.

The FAIP forage project included testing and demonstrating advanced irrigation practices for more extended hot and dry production seasons. While this project has provided knowledge transfer pertaining to irrigation of forage, these resources are largely pertinent to a single commodity and outcomes are based upon a relatively short (three-season) field trial.⁴

Priority Action #1

Share information regarding innovative water management technologies and practices

There are many innovative water management technologies and practices used in other jurisdictions, or within particular commodity production systems. In some cases, producers are not aware of these options or there is no information available about transferability and/or economics. Even when producers are interested in the potential of technologies or practices, they need to assess the applicability in the local context prior to investment/adoption. A broad-based ‘state of water technology, knowledge and innovation’ analysis could provide a useful “baseline”, particularly if accompanied by scans of innovative practices across specific commodities.

Activities

- I. Inventory innovative practices and technologies (by commodity or in general) locally and within comparable jurisdictions globally
- II. Develop a short list of potential practices/technologies to consider locally
- III. Evaluate the short list of practices/technologies for the local context (including economic considerations)
- IV. Transfer knowledge using fact-sheets/bulletins, working through traditional extension services and using non-technical language
- V. Support development of local trials and/or demonstration as needed

Implementation Details

- The diversity of industries in the Fraser Valley will need to be considered and may require a commodity-specific approach
- Determining which commodity groups to start with could be based on which groups are most interested and able to support the work in-kind or financially (e.g. quality considerations, relating to water management decisions, are integral for the berry sector which could be a good starting point)

⁴ The project also tested and demonstrated corn hybrids suited to both late planting and/or early harvesting and that are tolerant of heat and/or excessive moisture, as well as winter crops that are amenable to a range of planting and harvesting dates.

Implementation Details continued...

- A focus on small projects and easy to adopt technologies/practices that will conserve the most water is recommended
- Financial incentives for innovative practices are effective, but current cost-share programs are limited to a small number of farm practices and are difficult for producers to access
- If a commodity-specific approach is selected, the project structure could be modelled on the *Okanagan vineyard water-use efficiency and knowledge transfer* project

Possible Partners

BC Ministry of Agriculture

Agricultural organizations including (but not limited to):

- o BC Blueberry Council
- o BC Dairy Association
- o BC Greenhouse Growers' Association
- o BC Landscape and Nursery Association
- o BC Poultry Association
- o BC Strawberry Growers Association
- o Lower Mainland Horticulture Improvement Association
- o Raspberry Industry Development Council
- o Pacific Field Corn Association

Farmwest

Local research institutions (University of the Fraser Valley, University of British Columbia, Kwantlen College)

Timeframe

Short-term (less than two years)

Cost

Medium (\$50,000-\$100,000)

Impact Area 2: Increasing precipitation and extreme precipitation events

Strategy 2.1 [Prioritized] - Develop a coordinated cross-agency approach to agricultural ditch and drainage management

Progress to Date

This strategy has been partially addressed through two projects. The *Enhancing Collaboration for Agricultural Drainage and Ditch Management* project included a high level assessment of drainage and ditch management issues across the Fraser Valley and documented current processes and practices related to agricultural ditches and drainage. Challenges and solutions were identified through case studies and two workshops that engaged producers and local and provincial government staff. The summary report shares findings, identifies key actions and provides a draft “roadmap” of the current regulatory approvals process for ditch and drainage maintenance.

Building on action items identified through the first project, the *Climate Adaptive Drainage Management Forum* project developed detailed precipitation projections for the Fraser Valley to support integration of climate change into runoff and drainage management considerations. The project also included a research scan of innovative runoff and drainage management approaches. These resources were used to inform a Forum, which brought governments and producers together to discuss and prioritize options for adapting drainage and runoff infrastructure and management for future conditions.

Priority Action #2

Pilot producer-led coordinated drainage planning and management

Drainage planning and management within a drainage basin or agricultural area has proven successful in other jurisdictions. A producer-led pilot project could test the potential for this approach in the Fraser Valley. The project would need to take place in an area with drainage issues where there are interested producers (and other partners) that are willing to participate in a pilot project. The focus of the project would be to develop a Drainage Management Plan that, when combined with appropriate permit applications and funding commitments, results in a “shovel-ready” five-year work plan to address multiple objectives.

Activities

- I. Classifying watercourses by habitat and prescribed management activities (to increase management certainty for all parties)
- II. Pilot development of a coordinated management strategy in one agricultural drainage area including:
 - o Creation of producer-led Agricultural Drainage Planning Group
 - o Inventorying, characterizing and assessing the drainage (and possibly irrigation) area including identification of drainage and (and possibly irrigation) enhancement opportunities
 - o Piloting a multi-stakeholder, multi-objective drainage area planning process that embeds individual actions within broader plan
 - o Using completed plan to support broader investments in upgrades

Implementation Details

- Planning could identify some or all of the following:
 - o Infrastructure investment priorities
 - o Collaborative project opportunities for improvements to on-farm drainage and irrigation; conveyance networks and habitat conditions
 - o Outline best management practices by reach
 - o Schedule drainage maintenance work by reach
 - o Outline monitoring, reporting and adaptive management procedures.
- A pilot project of this nature could be documented and utilized as a case study or field site for future knowledge transfer activities related to agricultural drainage management

Possible Partners

BC Ministry of Agriculture
Local governments
Agricultural organizations (see list on page.10)
Ministry of Forests, Lands, Natural Resource
Operations and Rural Development
First Nations

Timeframe

Medium-term (2-5 years)

Cost

Medium (\$50,000-\$100,000)

Strategy 2.2 [Not Prioritized] - Identify, pilot and evaluate mechanisms to reduce runoff onto and off agricultural lands

Progress to Date

This strategy has been partially addressed through the *Climate Adaptive Drainage Management Forum* (described under Strategy 2.1). The research scan identified some innovative approaches for reducing runoff onto and off agricultural lands. Options were evaluated in part through the research scan itself, and in part through discussion at the Forum. Depending on actions implemented to achieve Strategy 2.1, some of these ideas could be incorporated into next steps.

Strategy 2.3 [Prioritized] - Develop adaptive and coordinated nutrient management strategies for the region

Progress to Date

No actions were undertaken by the CAI between 2015 and 2018 to accomplish this Strategy.

Priority Action #3

Research and demonstrate efficacy and economics of nutrient management at the commodity level

Current nutrient management practices, recommended strategies and challenges tend to be production system specific and are largely communicated and managed within commodity groups. However, how climate change will affect these nutrient management practices has been identified as a knowledge gap.

Studies are underway in the Fraser Valley to better understand the interaction between soil nutrients, crop needs and crop impacts to soils. The next step for this work will be linking appropriate management recommendations with soil type/commodity. Increasing knowledge transfer on beneficial management practices (by commodity and incorporating climate change implications) would benefit production.

Commodity-specific information should then be synthesized at a cross-commodity level to understand the scope of activity and knowledge across the Fraser Valley. Through this process, opportunities for working across the sector, for research collaboration and knowledge transfer overlap and opportunities may be identified.

These actions could be addressed through one project with three phases.

Activities

Phase One: Consolidate, assess and synthesize local nutrient management research

- I. Summarize information into a “state of local practice”, and should identify knowledge gaps, opportunities for collaboration, and commodity specific information

Activities continued...

Phase Two: Fill knowledge gaps surrounding how nutrient management will be affected by climate change and evaluate nutrient management practices for local context

- I. Building off results above and working at the commodity level, evaluate how climate change will affect nutrient management practices and identify vulnerable commodities/practices and opportunities for innovation
- II. Undertake a cost-benefit analysis of nutrient management technologies/practices by commodity (or cross-commodity if possible)

Phase Three: Produce cross-commodity and/or commodity specific knowledge transfer resources that include an analysis of the efficacy and economics of nutrient management practices

- I. Analyze and interpret research results and share with producers (in non-technical language)
- II. Knowledge transfer resources might include:
 - o Field days/posters at field days
 - o Workshops for producers on nutrient management strategies
 - o Fact sheets
 - o Workshop/ presentation at the Pacific Agriculture Show
 - o Presentations at research committee meetings and industry group Annual General Meetings

Implementation Details

- There is some work currently underway with raspberries; blueberries, strawberries, beef, dairy and poultry will also have information to draw from
- Findings from this project could inform a coordinated nutrient management pilot project
- Some current technologies for nutrient management include: nutrient injection, cover cropping and technologies to make manure more versatile to use (e.g. pelletizing). Crop rotation also plays a large role in nutrient management.

Possible Partners

Agriculture and Agri Food Canada
BC Ministry of Agriculture
Agricultural organizations (see list on page 7)
Local research institutions (see list on page 7)

Timeframe

Medium-term (2-5 years)

- o *Phase one:* fall/winter
- o *Phase two:* spring/summer (to accommodate any piloting or demonstration)
- o *Phase three:* knowledge transfer will be ongoing

Cost

High (\$100,000 +)

Impact Area 3: Changing Freshet Flood Risk

Strategy 3.1 [Not Prioritized] - Increase awareness of flood risk and potential impacts to agriculture

Progress to Date

This strategy was addressed through the report *Freshet flooding and Fraser Valley agriculture evaluating impacts and options for resilience*. The report assesses the overall economic value of agricultural production in the Fraser Valley and estimates the potential costs and losses to the sector under three different freshet flood scenarios. The report also identifies actions that can be undertaken by individual producers, sector groups and other partners to assist the agriculture sector to be prepared, and to reduce losses and speed recovery, in the case of a flood. Both the report and a report summary were shared broadly upon project completion.

Strategy 3.2 [Prioritized] - Coordinate sector, commodity and individual producer flood risk responses and planning

Progress to Date

No actions were undertaken by the CAI between 2015 and 2018 to accomplish this Strategy.

Priority Action #4

Develop effective mechanisms for supporting producers with farm-level flood preparedness and mitigation planning

Some resources already exist that could assist producers with farm-level flood preparedness and mitigation planning (see Implementation Details below). A focused effort on distribution (and/or refinement) of existing resources has been limited, and therefore uptake has also been limited. Producers have also identified the need for an individual that is resourced to support uptake/adoption of this type of planning. However before any materials are shared broadly, their utility should be assessed and the most effective delivery mechanism identified.

Activities

- I. Review range of existing resources and consult with producers about how to make them more effective
- II. Pilot or test the utility/effectiveness of existing resources and/or of specific recommendations within these resources

Activities continued...

- III. Refine materials as necessary
- IV. Identify champions and best delivery mechanisms for planning
- V. Launch resources in partnership with relevant commodity associations and roll-out broadly with appropriate financial or human resource supports

Implementation Details

- Existing relevant materials include:
 - o CAI and Delta region *Flooding Preparedness and Mitigation Pilot Project* (which piloted a specific preparedness tool)
 - o The more broadly focused *Emergency Planning and Preparedness Guides* created by the Ministry of Agriculture and sector partners. (Guides have been created for dairy, beef, poultry, pork, small mixed farms)
- While there are some commodity-focused materials, some commodity groups are lacking specific informational resources
- The focus should be on building on existing materials and ensuring accessible materials and feasible recommendations to ensure adoption/uptake
- It might be helpful to use “scenario-based planning” which walks people through impacts of specific events, (rather than materials focused on a general emergency).
- This project could be short-term if there were dedicated human resources to launch and share refined materials while offering planning support to producers. This approach would aim to reach as many producers as possible within a given time frame.
- An alternative approach would be to implement over a longer time period through a mixture of knowledge transfer/planning supports.

Possible Partners

BC Ministry of Agriculture
Agricultural organizations (see list on page.10)
Local governments
Emergency Management BC
Insurance companies
Public Service Canada (National Disaster Mitigation Fund)

Timeframe

Short term (less than 2 years)

Cost

High: \$100,000+

Impact Area 4: Changes to Pests and Pollinators

Strategy 4.1 [Prioritized] - Pilot a cooperative pest surveillance program for priority risks

Progress to Date

This strategy has been partially addressed through two consecutive projects. The *Agricultural Pest Assessment* included consultation across 30 commodities to document recent pest-related projects and issues. A comprehensive inventory of activities, issues and priorities was generated to help guide planning and next steps. In December 2016, a cross-sector workshop was held to share and discuss the inventory findings.

The *Enhancing Collaboration for Managing Emerging Pests* built on the results of the agricultural pest assessment by analyzing the inventory results to identify priority pests. A series of (7) new fact sheets were developed to address key information gaps and (2) targeted strategic planning sessions were focused on priority pests (spotted wing drosophila and helminths). A cross sector workshop was held in December 2017 to share project results and continue to build on collaborative action planning.

Priority Action #5

Develop coordinated, regional and cross-commodity monitoring and surveillance of emerging and priority pests

Undertaking annual regional-level surveillance (i.e. collection and compilation of survey data) to assess and document occurrence and distribution of pests was flagged as a high priority in order to help to track overall/seasonal shifts in pest distribution as well as arrival of new pests of concern. This action could include both a more formal and structured survey approach, as well as a process to engage a broader group of producers and professionals.

While it's helpful to document the presence and changes of particular problem pests, this action should focus on the next layer of *emerging* pests (i.e. those that are not yet federal or provincial priorities). The goal of this action is to be very proactive in surveillance and monitoring for what is coming or expected to grow in severity, rather than being reactive to new pests. The overall focus of this action is to support growers, and others in the sector, to engage and be proactive with their own awareness, monitoring and reporting.

Activities

- I. Determine which pests will be the focus. Criteria for determining pests to survey could include:
 - o Which pests neighbouring jurisdictions are mapping and surveying
 - o Which pests are in climates similar to the future climate of a zone
 - o Refer to emerging pests in inventory and compare with Ministry of Agriculture focus (what is already being done) to determine the gaps

Activities continued...

- II. Ground truth the ‘pests focus list’ with affected industries and pest specialists
- III. Initiate monitoring based on shortlist
- IV. An annual meeting could be used to check back with industry on list of focus pests for the coming year

Implementation Details

- Some form of centralized survey data collection/collation will be needed if changes are to be properly documented and understood
- It is important to get as many “eyes on the ground” as possible. Sales representatives, mechanics and others who frequently visit farms could be included in training/surveillance activities
- There is potential for individuals who already contract private pest monitoring services on their properties to contribute data into a centralized system for public consumption
- A less formal and low cost surveillance/monitoring program would train people to identify prioritized pests and create broad awareness on the ground
- A more formal version of this monitoring would be centralized, organized, include pest identification training and include more human resourcing

Possible Partners

Pest management specialists/consultants
Agricultural sales representatives and mechanics
BC Ministry of Agriculture
Agriculture and Agri-Food Canada
All agricultural organizations with Fraser Valley members

Timeframe

Long-term (5+ years)

- o On-going. Multi-year.
- o Surveillance timing will be pest-specific and is tied to season/ climate thresholds

Cost

Medium (\$50,000 - \$100,000)

Strategy 4.2 [Prioritized] - Increase research and information transfer regarding pest lifecycles, identification and management

Progress to Date

Through factsheets and pest-specific planning sessions, the *Enhancing Collaboration for Managing Emerging Pests* project resulted in a set of deliverables that improve information transfer on pest lifecycles, identification and management for a set of key emerging and high priority pests. Factsheets were distributed through the Pacific Agricultural Show, agricultural organizations and a number of other mechanisms.

The FAIP project, *Evaluation of Thrips Damage to Potatoes in a Changing Climate*, assessed how potato yields are affected by thrips at varying crop stages, local thrips transmission of tomato spotted wilt virus, and the varietal preferences of thrips (all in relation to measured growing season weather conditions). The goal was to better prepare growers to manage this pest through changing climate

conditions. Information transfer occurred through numerous presentations, workshops and completion of a fact sheet showcasing project results.

While progress has been made, there is considerably more work to be done in the areas of pest research and knowledge transfer, as well as building forward on collaboration for effective management of priority pests.

Priority Action #6

Support targeted pest specific (multiple commodity) planning and knowledge transfer sessions

The work to date has initiated dialogue around management of a small selection of priority pests between multiple commodity groups. This approach appears to be valuable but needs to include additional pests and commodity groups, as well as follow-up steps relating to pests included to date. Also, information for pest identification, management and control is constantly improving, so follow-up activity and future planning sessions can continue to distribute the latest information to producers and producer groups. It is also possible that new (pest-specific) knowledge transfer resources will evolve out of the targeted planning approach.

There is also value in maintaining and updating the cross-commodity pest project inventory (list) and an annual cross-commodity meeting (such as those held for the last two years). Targeted planning sessions, updating the project list, additional inventory analysis (if needed) and an annual meeting could all be bundled together for efficiency in delivery.

Activities

- I. Review the *Fraser Valley Pest Inventory Analysis* and, if needed, conduct additional assessments of immediate and near-term pest threats to the sector
- II. Select pests of focus for strategic planning sessions and coordinate new sessions
- III. Provide support and follow-up on priority actions from previous sessions and new sessions. This may include fact sheet development, evaluation and sharing of existing/appropriate mobile applications, or other knowledge transfer activities
- IV. Support processes to ensure that the inventory priorities and project list are kept up to date (e.g. annual meeting or another process to gather information, update and distribute annually)
- V. Keep sharing the information related to potential threats with all commodities

Implementation Details

- It was undetermined if this action should continue to work with the same pests, and keep the scope limited, or, whether future sessions should begin the conversation about other emerging (multiple commodity) pests
- The sessions need to share the best possible research on the pest in question (e.g the U.S. is doing a large literature review and meeting every year related to SWD)

Implementation details continued...

- Cross-commodity knowledge transfer and sharing could be linked to the Pacific Agriculture Show
- Should bolster the efforts of Ministry of Agriculture staff to provide presentations and information on pest threats
- More outreach around the inventory is needed to prevent redundant research and projects within the sector
- Strategic planning sessions should be used to hear industry research needs
- Successful knowledge transfer resources depend on investment in developing a high quality product and adequate investment in distribution (including search engine optimization)
- For pest control, knowledge transfer is only useful if there is broad uptake. Effectiveness of adequate control on the ground relies on uptake of control across the commodity group (or multiple commodities if pest is presence or hosted on multiple commodities)

Possible Partners

Agriculture and Agri Food Canada
BC Ministry of Agriculture
Agricultural organization (partners will depend on pests selected as focus)
Fraser Valley Regional District (if invasive species are included as a focus)
Private sector pest management companies and consultants

Timeframe

Short term (under 2 years)

Cost

Medium (\$50,000-\$100,000)

Strategy 4.3 [Not Prioritized] - Evaluate the impacts of weather conditions and management practices on pollinators and pollinator/crop interactions

Progress to Date

No actions were undertaken by the CAI between 2015 and 2018 to accomplish this Strategy.

Impact Area 5: Greater Frequency and Intensity of Extreme Heat Events

Strategy 5.1 [Prioritized] - Identify suitable approaches for minimizing impacts of extreme heat to product quality and health

Progress to Date

No actions were undertaken by the CAI between 2015 and 2018 to accomplish this Strategy.

Priority Action #7

Develop state of practices and technologies assessment for mitigating extreme heat impacts

There are many technologies and practices utilized in warmer climates that may have increasing applicability for producers in the Fraser Valley. While producers may be aware of these approaches, it is important to consider their applicability and effectiveness, as well as cost-benefit, in the local context.

Technologies and practices for managing and mitigating the affects of extreme heat on crop quality or livestock health will be commodity-specific and will be designed for local conditions and production specifics. However, there are likely to be practices and technologies to draw on and adapt from other areas. A state of practices and technologies scan could either be structured as a cross-commodity study or could focus specifically on a sub-set of those commodities in the Fraser Valley that are the most vulnerable to impacts associated with extreme heat.

Activities

Phase One:

- I. Review the practices and technologies currently used in the Fraser Valley to manage through periods of “extreme heat”, as well as those used by producers in places that are more accustomed to the types of temperatures “spikes” anticipated (e.g. Israel, southern California, etc.)
- II. Evaluate which approaches, practices and technologies might be most applicable to the Fraser Valley
- III. Summarize options and ground truth ideas with producers in a workshop setting for input

Phase Two:

- IV. Once the best options for the Fraser Valley have been identified, initiate piloting and demonstration of these options in the field
- V. Evaluate which approaches, practices and technologies might be most applicable to the Fraser Valley

Implementation Details

- Another option for sharing practices/technologies with producers would be to connect with the Pacific Agriculture Show and have a section of the trade show devoted to “adaptive” technologies – this could include for extreme heat but also water management technologies (see Priority Action #1)

Possible Partners

Agriculture & Agri-Food Canada
BC Ministry of Agriculture
Agricultural organizations(see list on page 7)
Research Institutions (see page 7)

Timeframe

Phase One: Short term (less than 2 years)
Phase Two: Medium term (2-5 years)

Cost

Phase One: Medium (\$50,000-\$100,000)
Phase Two: Medium (\$50,000-\$100,000)

Strategy 5.2 [Not Prioritized] - Evaluate opportunities for addressing labour supply during periods of peak demand

Progress to Date

No actions were undertaken by the CAI between 2015 and 2018 to accomplish this Strategy

Appendix I

Fraser Valley Voting Card



**FRASER VALLEY
VOTING CARD**



<p>Check ONE strategy from Area A</p>	<p>A Impact Area 1: Warmer and drier summer conditions</p> <table border="1"><tbody><tr><td data-bbox="540 527 906 638"><p>Strategy 1.1 Address critical information gaps to assist producers with water management decisions</p></td><td data-bbox="915 527 1268 638"><p>Strategy 1.2 Strengthen knowledge transfer of water management tools, technologies and resources</p></td></tr></tbody></table>	<p>Strategy 1.1 Address critical information gaps to assist producers with water management decisions</p>	<p>Strategy 1.2 Strengthen knowledge transfer of water management tools, technologies and resources</p>	
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<p>Check TWO strategies from Area B</p>	<p>B Impact Area 2: Increasing precipitation and extreme precipitation events</p> <table border="1"><tbody><tr><td data-bbox="391 814 675 953"><p>Strategy 2.1 Develop a coordinated cross-agency approach to agricultural ditch and drainage management</p></td><td data-bbox="688 814 972 953"><p>Strategy 2.2 Identify, pilot & evaluate mechanisms to reduce runoff onto & off agricultural land</p></td><td data-bbox="985 814 1269 953"><p>Strategy 2.3 Develop adaptive & coordinate nutrient management strategies for the region</p></td></tr></tbody></table>	<p>Strategy 2.1 Develop a coordinated cross-agency approach to agricultural ditch and drainage management</p>	<p>Strategy 2.2 Identify, pilot & evaluate mechanisms to reduce runoff onto & off agricultural land</p>	<p>Strategy 2.3 Develop adaptive & coordinate nutrient management strategies for the region</p>
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<p>Check ONE strategy from Area C</p>	<p>C Impact Area 3: Changing freshet flood risk</p> <table border="1"><tbody><tr><td data-bbox="540 1100 891 1226"><p>Strategy 3.1 Increase awareness of flood risk and potential impacts on agriculture</p></td><td data-bbox="915 1100 1265 1226"><p>Strategy 3.2 Coordinate sector, commodity & individual producer flood risk responses & planning</p></td></tr></tbody></table>	<p>Strategy 3.1 Increase awareness of flood risk and potential impacts on agriculture</p>	<p>Strategy 3.2 Coordinate sector, commodity & individual producer flood risk responses & planning</p>	
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<p>Check TWO strategies from Area D</p>	<p>D Impact Area 4: Changing pests and pollinators</p> <table border="1"><tbody><tr><td data-bbox="391 1402 675 1541"><p>Strategy 4.1 Pilot a cooperative pest surveillance program for priority risks</p></td><td data-bbox="688 1402 972 1562"><p>Strategy 4.2 Increase research and information transfer regarding pest life cycles, identification and management</p></td><td data-bbox="985 1402 1269 1562"><p>Strategy 4.3 Evaluate the impacts of weather conditions and management practices on pollinators and pollinator/crop interactions</p></td></tr></tbody></table>	<p>Strategy 4.1 Pilot a cooperative pest surveillance program for priority risks</p>	<p>Strategy 4.2 Increase research and information transfer regarding pest life cycles, identification and management</p>	<p>Strategy 4.3 Evaluate the impacts of weather conditions and management practices on pollinators and pollinator/crop interactions</p>
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<p>Check ONE strategy from Area E</p>	<p>E Impact Area 5: Greater frequency and intensity of extreme heat events</p> <table border="1"><tbody><tr><td data-bbox="540 1703 899 1835"><p>Strategy 5.1 Identify suitable approaches for minimizing impacts of extreme heat to product quality/health</p></td><td data-bbox="915 1703 1268 1835"><p>Strategy 5.2 Evaluate opportunities for addressing labour supply during periods of peak demand</p></td></tr></tbody></table>	<p>Strategy 5.1 Identify suitable approaches for minimizing impacts of extreme heat to product quality/health</p>	<p>Strategy 5.2 Evaluate opportunities for addressing labour supply during periods of peak demand</p>	
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Appendix II

Summary of strategies, actions and implementation to date

Impact Area 1 Warmer and drier summer conditions		
Strategy	Actions	Implementation Details
Strategy 1.1 Address critical information gaps to assist producers with water management decisions	Action 1.1A Bring producers and key partners together for information exchange regarding the Water Sustainability Act	mostly addressed by workshop/event: <i>Fraser Valley Agricultural Water Symposium</i>
	Action 1.1B Develop producer-focused informational resources regarding agricultural water issues	
Strategy 1.2 Strengthen knowledge transfer of water management tools, technologies and resources	Action 1.2A Promote the use of BC-Specific water management tools and resources	partially addressed by workshop/event: <i>Fraser Valley Agricultural Water Symposium</i>
	Action 1.2B Share information regarding innovative water management technologies and practice	
	Action 1.2C Demonstrate/evaluate potential of agricultural water management innovations not commonly used in the Fraser Valley	partially addressed by FAIP project: <i>Strategies to Improve Forage Yield and Quality while Adapting to Climate Change</i>
Impact Area 2 Increasing precipitation and extreme precipitation events		
Strategy	Actions	Implementation Details
Strategy 2.1 Develop a coordinated cross-agency approach to agricultural ditch and drainage management	Action 2.1A Assess the current state of agricultural ditches and drainage across the FVRD	partially addressed by report: <i>Enhancing Collaboration for Agricultural Drainage and Ditch Management</i> and forum: <i>Climate Adaptive Drainage Management Forum</i>
	Action 2.1B Develop options to improve coordination of ditch and drainage management	
Strategy 2.2 Identify, pilot & evaluate mechanisms to reduce runoff onto & off agricultural land	Action 2.2A Conduct background research to identify most promising options for runoff reduction	partially addressed by forum: <i>Climate Adaptive Drainage Management Forum</i>
	Action 2.2B Implement pilot projects to evaluate runoff management approaches	
Strategy 2.3 Develop adaptive & coordinated nutrient management strategies for the region	Action 2.3A Evaluate the relationship between climate change and nutrient management in the Fraser Valley	not yet addressed
	Action 2.3B Develop and pilot strategic approaches for nutrient management	

Impact Area 3 Changing freshet flood risk

Strategy	Actions	Implementation Details
Strategy 3.1 Increase Awareness of flood risk and potential impacts on agriculture	Action 3.1A Evaluate the potential impacts and costs to agriculture associated with freshet flooding	mostly addressed by report: <i>Freshet flooding and Fraser Valley agriculture evaluating impacts and options for resilience</i>
	Action 3.1B Provide information materials to enhance producer awareness of flood risk and available resources and supports	
Strategy 3.2 Coordinate sector, commodity & individual producer flood risk responses & planning	Action 3.2A Develop a mechanism for active/on-going sector participation in flood protection and flood management planning	not yet addressed
	Action 3.2B Pilot commodity-level flooding preparedness, mitigation and recovery planning	
	Action 3.2C Refine and deliver planning for individual producer flooding preparedness/mitigation and recovery	

Impact Area 4 Changes to pests and pollinators

Strategy	Actions	Implementation Details
Strategy 4.1 Pilot a cooperative pest surveillance program for priority risks	Action 4.1A Conduct an assessment of immediate and near-term pest threats to the sector	mostly addressed by report/inventory: <i>Agricultural Pest Assessment</i> and fact-sheets/planning sessions: <i>Enhancing Collaboration for Managing Emerging Pests</i>
	Action 4.1B Develop partnerships and mechanisms for coordinated, regional and cross-commodity monitoring	
Strategy 4.2 Increase research and information transfer regarding pest lifecycles, identification and management	Action 4.2A Conduct background research to identify most promising options for runoff reduction	partially addressed by report/inventory: <i>Agricultural Pest Assessment</i> and fact-sheets/planning sessions: <i>Enhancing Collaboration for Managing Emerging Pests</i>
	Action 4.2B Provide effective informational materials for producers for pest identification, management and control options (particularly for emerging pests)	
	Action 4.2C Educate the public on pest detection, invasive plant management and pest host species	not yet addressed
	Action 4.2D Support local governments to improve weed and invasive species management on public lands (including ditch maintenance)	

**Impact Area 4 (continued)
Changes to pests and pollinators**

Strategy	Actions	Implementation Details
Strategy 4.3 Evaluate the impacts of weather conditions and management practices on pollinators and pollinator/crop interactions	Action 4.3A Undertake a vulnerability assessment of climate change impacts on pollinators	not yet addressed
	Action 4.3B Evaluate the interactions between weather, cropping systems and pollinators	

**Impact Area 5
Greater frequency and intensity of extreme heat events**

Strategy	Actions	Implementation Details
Strategy 5.1 Identify suitable approaches for minimizing impacts of extreme heat to product quality/health	Action 5.1A Identify suitable approaches for minimizing impacts of extreme heat to product quality/health	not yet addressed
	Action 5.1B Develop commodity-specific materials to support adoption of new technologies and practices	
Strategy 5.2 Evaluate opportunities for addressing labour supply during periods of peak demand	Action 5.2A Assess potential effects of climate change on agricultural labour demand in the Fraser Valley	not yet addressed
	Action 5.2B Evaluate and pilot options for addressing unanticipated seasonal shifts in labour demand	