British Columbia Plant Health Strategy for Agriculture 2021 – 2026

PLANT HEALTH UNIT
PLANT AND ANIMAL HEALTH BRANCH

BRITISH COLUMBIA
Ministry of Agriculture, Food and Fisheries

COVER IMAGES

- (Top left)
  Fusarium sp. in petri dish

- (Top right)
  brown marmorated stink bug on scarlet firethorn (ornamental)

- (Bottom left)
  anthracnose on blueberries

- (Bottom right)
  Japanese beetle feeding on foliage

Contents

Executive Summary

THE PLANT HEALTH UNIT serves the crop production industry and supports the bioeconomy in British Columbia. Plants are the foundational link in the food chain, providing sustenance for British Columbians directly through food crops and indirectly through the provision of animal feed. Good plant health contributes to food security, livelihoods, growth of small businesses and rural economic development. Plant pests (insects, fungi, bacteria, viruses, nematodes) directly impact the competitiveness of the crop industry by reducing yield and quality, increasing production costs and potential loss of market access.

Staffed with professionals in the disciplines of plant pathology, entomology and pesticide science, the Plant Health Unit in the Plant and Animal Health Branch leads the delivery of integrated pest management strategies that enhance consumer confidence and economic growth for B.C.'s multibillion-dollar agriculture sector. The Unit has the responsibility to diagnose plant health problems, monitor and address pest outbreaks (e.g. Japanese beetle, Eastern filbert blight, little cherry virus, armyworm), make policy recommendations on plant health issues, administer the provincial *Plant Protection Act* and Regulations, provide guidance on the safe use of pesticides and facilitate the addition of new uses on registered pesticide products and registration of new products.

The Unit includes a Plant Health Laboratory (est. 1967) that provides plant health diagnostic services on samples submitted to the lab, monitors plant health trends, and delivers plant health programs for all commercial crops and urban agriculture plants grown in B.C. These include cannabis, grapes, grains, oilseed, tree fruits, berries, greenhouse and field vegetables and landscape plants, totaling hundreds of horticultural crops, each with its own unique pest associations.

THE 2021-2026 PLANT HEALTH STRATEGY IDENTIFIES 6 OBJECTIVES THAT FOCUS ON:

1. Identifying and advising on pest problems using the principles of Integrated Pest Management
2. Surveillance and Pest Risk Assessment
3. Diagnosis of pests that threaten crops in B.C.
4. Modernization of legislation to support plant health policies and programs
5. Integration of climate change adaptation into plant health programs
6. Engagement and strategic partnerships that elevate the profile of plant health in B.C.

The 2021-2026 Plant Health Strategy seeks to build on the strengths of the Unit and leverage opportunities such as heightened awareness of local food supply chains brought about by the COVID-19 pandemic. The Plant Health Strategy supports the objectives of the Plant and Animal Health Branch, and the goals of the Ministry of Agriculture, Food and Fisheries Service Plan 2020/21 – 2022/23.

2021-2026 PLANT HEALTH STRATEGIC OBJECTIVES AND TACTICS

OBJECTIVES		TACTICS
Integrated Pest Management	Identifying and advising on pest problems using biological, cultural, physical and chemical methods that tackle pest issues while minimizing health and environmental risks	• Best management guides, factsheets and web pages for B.C. producers. • Support access to safe and effective pest control products and technology for B.C. producers, including biopesticides • Develop programs for safe and efficient application of pesticides • Develop research programs on critical pests and pest management • Rapid response programs including emergency use registrations • Participation in biovigilance studies to detect trends linked to agricultural practices or new pesticides
Surveillance and Pest Risk Assessment	Conducting field surveys, literature reviews and ranking of plant pests	• Collection of field data on pest occurrence or absence • Development of pest risk assessments • Production of pest alerts • Make science-based information available for decision-making • Ranked lists of plant pests
Diagnostics	Timely and accurate diagnosis of new and established pests that pose a risk to B.C. agriculture	• Accurate and timely diagnosis of plant pest problems and provision of useful diagnostic reports • Enable early detection of priority/critical plant pests • Support surveillance and detection programs for established and emerging pests • Development of laboratory modernisation and innovation initiatives • Obtain expanded laboratory space • Support cannabis production through diagnostic capabilities
Regulatory Framework	Modernizing legislation to support plant health policies and programs	• Review and modernize the B.C. *Plant Protection Act* and regulations • Contribute to modernizing other relevant legislation provincially and federally • Build awareness of regulatory tools
Climate change adaptation	Integration of climate change adaptation into plant health programs	• Anticipate the distribution of new and established pests in B.C., especially due to climate change by horizon scanning, species distribution modelling and scenario planning • Build awareness of climate change adaptation strategies for growers • Conduct research to understand local climate change impacts to pests and diseases that affect plant health
Engagement and Strategic Partnerships	Collaborations and relationships that elevate the profile of plant health in B.C.	• Representation on multi-stakeholder advisory bodies and working groups • Collaborative research projects • Communication of scientific findings • Build awareness of plant health with government and the public • Interactions with non-traditional partners to create new opportunities in the bioeconomy

Introduction

GROWERS IN BRITISH COLUMBIA rely on the Plant Health Unit to support the production of safe, healthy crops and agriculture products on farms, orchards, groves, greenhouses and nurseries. The COVID-19 pandemic has underscored the importance of local markets and food security for the growing population in British Columbia.

The farming sector in B.C. (crop production and animal production) experienced record economic growth in 2019, totaling $3.9 billion in farm cash receipts,[1] more than tripling in value between 2011 and 2019. Crop production alone totalled $2.1 billion in farm cash receipts in 2019, up 19% from 2018, with a significant growth area in licensed cannabis sales.[2] B.C. remains Canada's largest fruit-producing province and second largest greenhouse vegetable producing province. Crop production is an important part of primary agriculture in B.C., which supports the agriculture sector, valued at $15.5 billion (in 2019).

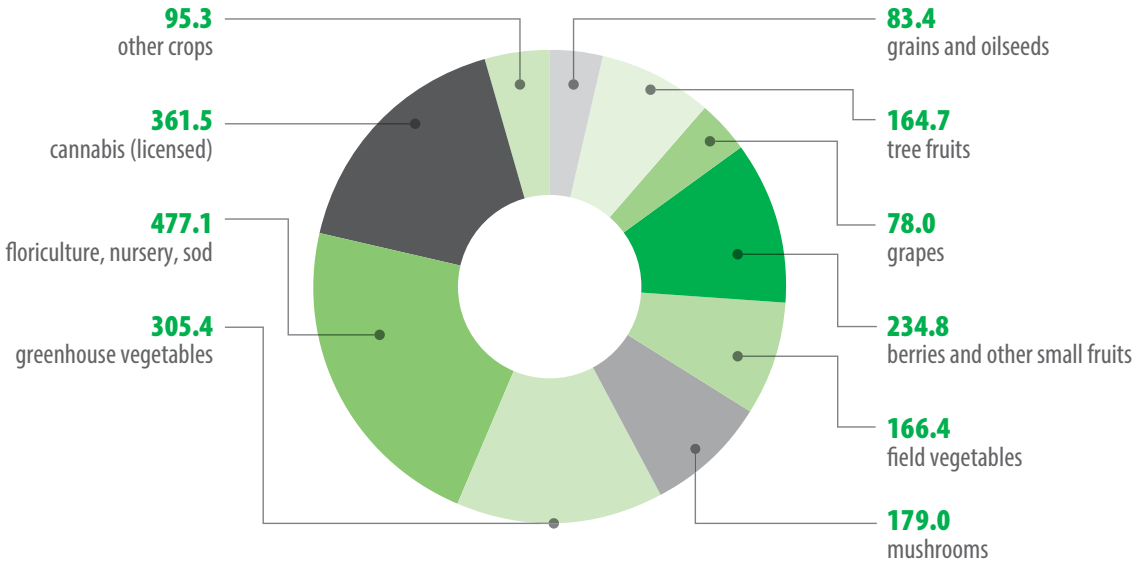
The province's mild climate yields approximately 200 farm commodities from 17, 528 farms (in 2019). B.C. has the most diverse agriculture industry in Canada. Mild climate coupled with a diversity in agricultural commodities and the province's location as a gateway to the Pacific make crop protection a priority for B.C.'s bioeconomy. However, climate change, travel and trade have increased the incidents of insect pests and disease.

The Food and Agriculture Organisation estimates that globally, 40% of food crops are lost due to insect pests and diseases each year. Together, plant diseases and insect pests incur a global cost of approximately $363 billion/yr. Crop damage from pests, such as insects, mites, fungi, bacteria, viruses, phytoplasmas, nematodes and weeds reduce crop quality and yield, increase the cost of production, and lower economic viability. There is also the potential for lost export markets due to quarantine measures and regulatory restrictions.

This document outlines the Plant Health Strategy for 2021-2026. A previous Plant Health Strategy was developed for 2013-2018. The Plant Health Strategy for 2021-2026 identifies 6 objectives that build on current opportunities in plant health and the Ministry's legislative mandate related to plant health.

1 Farm cash receipts are revenue from the sale of agricultural commodities, program payments from government agencies and payments from private crop and livestock insurance programs.

2 Legalisation of non-medicinal cannabis in Canada took place on October 17, 2018.



B.C. Crops farm-gate[3] value ($ millions) by commodity group in 2019. Approximate total: $2.1 billion. While the crop industry is relatively small in B.C. compared with other provinces, the diversity of crops and associated pest complement results in numerous pest issues that must be addressed by the Plant Health Unit. Within each commodity type represented in the figure are numerous crops, each with its own pest complement – blueberries, blackberries, cranberries, raspberries, strawberries, peaches, apricots, pears, cherries, nectarines, plums, asparagus, beans, beets, broccoli, Brussels sprouts, cabbage, carrots, cauliflowers, celery, corn, cucumbers, gherkins, garlic, green onions, leeks, lettuce, parsley, parsnips, peppers, potatoes, pumpkins, radishes, rhubarb, turnips, spinach, squash, tomatoes, watermelons and others. Figure source: Statistics Canada and Adapted from Statistics Canada. Table 002-0001 Farm cash receipts, annual.

3 The "farm gate" value is the pricing point of production, excluding charges for transport or delivery.

The Plant Health Unit

FOR OVER 100 YEARS, the Provincial Government has been providing leadership, scientific support and coordination to crop production industries for the promotion of plant health and the production of safe, high quality products from sustainable agriculture systems.

The Plant Health Unit, within the Plant and Animal Health Branch, leads the Ministry's Plant Health Strategy. The Plant Health Unit consists of professional staff in the disciplines of plant pathology, entomology and pesticide science (Appendix 2).

Staff facilitate the implementation of integrated pest management practices to mitigate the impact of plant pests; diagnose plant health problems; monitor and address pest outbreaks; make policy recommendations on plant health issues; administer the provincial *Plant Protection Act* and provide guidance on the use of pesticides.

The Plant Health Unit works closely with other Ministry staff including Industry Specialists and Regional Agrologists.

Plant Health Unit – Vision

Safe, high quality B.C. agricultural commodities produced using economically viable, environmentally sustainable and socially responsible pest management practices.

Plant Health Unit – Goals

To work with industry, government partners and the public to safeguard our agricultural land resource from the adverse impacts of plant pests, and to protect plant health and quality through the application of sustainable pest management technologies and practices that enhance consumer confidence and economic growth.

HIGHLIGHTS OF BRITISH COLUMBIA'S PLANT HEALTH HISTORY

1888	Noxious Weeds Act, B.C.
1888	Federal Agassiz Experimental Farm opens
1892	Horticulture Board Act, B.C. enabled regulations to prevent disease spread
1894	Department of Agriculture Act, B.C.
1894	First agricultural pest inspector appointed
1906	First B.C. pest management guide published (tree fruits)
1912	B.C. first Provincial Plant Pathologist in Canada
1919	B.C. joins Western Plant Board
1935	B.C.'s *Plant Protection Act* receives royal assent
1967	B.C. Department of Agriculture Plant Diagnostic Lab established in Cloverdale
1968	B.C. establishes provincial pesticide regulations (Dept. of Ag.)
1973	B.C. Plant Protection Advisory Council formed
1983	Ministry's insect biocontrol demo program results in North America's first greenhouse industry biological pest management program and two commercial insectaries in B.C.
1989	Sterile Insect Release Program introduced to achieve area-wide suppression of codling moth
1990	Pesticide Applicator Course for B.C. Agriculture Producers published
1992	B.C. farmers require certification to use pesticides classed as restricted by the Ministry of Environment
1995	First B.C. Minor Use Commodity Committee
2002	B.C provincial crop profiles introduced
2003	Integrated Pest Management Act replaces Pesticide Control Act
2005	Invasive Plant Council of B.C. formed
2009	Memorandum of Understanding on Critical Plant Pests between provincial and federal agencies signed
2011	Weed Control Act administration transferred to FLNRO
2019	Japanese beetle becomes a regulated pest in B.C.
2021	First cannabis samples are submitted to the Plant Health Laboratory

Legislative Mandate

THE PLANT HEALTH UNIT administers the *Plant Protection Act* and Regulations. The *Plant Protection Act* provides a legislative mandate for the prevention of the introduction and spread of pests destructive to plants in British Columbia, including the powers of inspectors and the authority to establish quarantine areas. At present, there are 7 Regulations administered under the *Plant Protection Act*. We often work alongside our federal counterparts to regulate pests.

OTHER LEGISLATION:

Other municipal, provincial, federal, and international regulations may influence the delivery of the Plant Health Strategy and current crop protection practices in B.C. Staff within the Plant Health Unit provide input on the potential impacts of new or proposed legislation.

Administration of the *Weed Control Act* and weed expertise resides with the Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

THE IMPORTANCE OF WEED MANAGEMENT IN AGRICULTURE

Agricultural weeds account for the greatest economic impact of all pests, negatively impacting productivity and competitiveness. An analysis of economic impacts of just 7 invasive plants indicated that without intervention, the estimated economic damage was $65 million in 2008, rising to $139 million by 2020. (Invasive Species Council of British Columbia)

The Canadian Food Inspection Agency estimates that invasive plants in crops and pastures alone cost approximately $2.2 billion every year in Canada.

KEY LEGISLATION ADDRESSING PLANT HEALTH IN BRITISH COLUMBIA

Municipal/Regional

- Bylaws on pesticides and invasive pests
- Community Charter

Provincial

- Plant Protection Act
- Weed Control Act
- Farm Practices Protection (Right to Farm) Act
- Integrated Pest Management Act
- Seed Potato Act
- Forest and Range Practices Act

International

- International Plant Protection Convention

Federal

- Plant Protection Act
- Pest Control Products Act
- Species at Risk Act

Regulations **under the B.C. Plant Protection Act**

- Bacterial Ring Rot Regulation
- Blueberry Maggot Control Regulation
- Domestic Bacterial Ring Rot Regulation
- Golden Nematode Regulation
- Japanese Beetle Control Regulation
- Little Cherry Control Regulation
- North American Gypsy Moth Eradication Regulation

Linkage to the Ministry of Agriculture, Food and Fisheries Service Plan 2020/21 – 2022/23

THE MINISTRY OF AGRICULTURE, FOOD AND FISHERIES Service Plan 2020/21 – 2022/23 lists the following goals:

1. **GROW BC:** Build sustainable production and help B.C. producers expand local food production
2. **FEED BC:** Build the availability, value and variety of B.C. food
3. **BUY BC:** Build consumer awareness and demand and help local producers market their products to grow their businesses

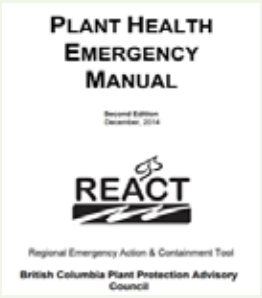
The Plant Health Unit Strategy supports these goals. Our operations are an essential service for growers – our Plant Health Laboratory remained open for business throughout the Covid-19 pandemic. We support the delivery of sustainable pest management practices that enhance consumer confidence and economic growth for B.C.'s multibillion-dollar agriculture sector.

The Plant Health Unit staff work closely with Ministry specialists, as well as other ministries and external stakeholders to implement the Service Plan, which enables the B.C. agriculture industry to produce healthy, competitive and profitable crops using environmentally sustainable practices.

CODLING MOTH

Codling Moth is a non-native pest of pome fruit which was introduced to B.C. around 1900. The Provincial Government has collaborated with fruit growers on management programs since the 1920's, including regulatory measures, research, extension and support for the Okanagan Sterile Insect Release Program.

BRITISH COLUMBIA PLANT PROTECTION ADVISORY COUNCIL



The British Columbia Plant Protection Advisory Council (BCPPAC) provides a forum to address plant health and plant quarantine issues of concern to British Columbia. Participants include federal and provincial agencies, regional and municipal governments, universities and industry. Concerns addressed include both recently introduced pests and pests under active management. The Plant Health Unit has active membership in BCPPAC, participates in the technical advisory committees, listed in the REACT Manual.

Linkage to the Plant and Animal Health Branch Objectives (2018)

THE PLANT HEALTH UNIT is one of four units in the Plant and Animal Health Branch. The Branch protects British Columbia's plant and animal population from harm caused by insect pests and diseases. With a specific focus on insect pests and diseases that negatively impact agricultural commodities, the Branch oversees a world-class diagnostic testing facility, a focused research portfolio, and a regulatory compliance and management best-practices team.

Together, the four units allow the Branch to diagnose, monitor, and assist in controlling and preventing plant and animal pests and diseases in British Columbia. The Branch also supports the province's adoption of innovative, sustainable management technologies and practices that support improved quality, consumer confidence, and global competitiveness.

As part of the public service, the Branch is accountable to the government of British Columbia. The Branch relies on its disciplined decision-making process to ensure that its services support a thriving, sustainable agricultural sector for the benefit of all British Columbians.

The Branch has the following **OBJECTIVES**:

1. Improve the state of plant and animal health through diagnostic excellence.
2. Identify and understand pest and disease patterns with the goal of minimizing the likelihood of an outbreak, as well as minimizing the impacts of plant and animal health threats.
3. Improve the state of knowledge with respect to provincial plant and animal health.
4. Support the socially responsible development of British Columbia's agricultural sector.
5. Support the Ministry's food quality and food safety objectives through diagnostic, research, and regulatory enforcement excellence.

ENDURING ACTIVITIES BY THE PLANT HEALTH UNIT THAT SUPPORT MINISTRY GOALS:

- Preventing and managing critical plant pests that threaten crop quality, productivity and biodiversity.
- Protecting market access from the impacts of important invasive and quarantine pests.
- Providing diagnostic services for plant pests.
- Surveillance of new invasive pests to help provide management guidelines.
- Researching, developing and providing information on pest management, including printed and web-based information, demonstrations, displays, presentations, and responding to inquiries.
- Finding solutions to pest issues through emergency use and minor use pesticide registrations.
- Facilitating access to effective IPM-based strategies to protect crops from the impacts of pests.
- Administering the provincial *Plant Protection Act*.
- Supporting Environmental Farm Planning.
- Providing guidance on the management and use of pesticides in agriculture to enhance environmental stewardship, worker protection, urban/agriculture relationships and food safety.

Strategic Objectives

THE FOLLOWING 6 OBJECTIVES will guide the management of the Plant Health Unit:

1. Identifying and advising on pest problems using the principles of Integrated Pest Management
2. Surveillance and Pest Risk Assessment
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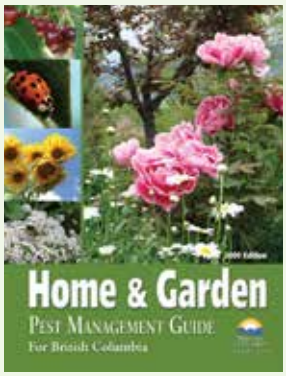
6. Engagement and strategic partnerships that elevate the profile of plant health in B.C.

HOME AND GARDEN PEST MANAGEMENT GUIDE



The *Home & Garden Pest Management Guide* supports urban agriculture in B.C. It contains information on over 400 common insects and diseases, with emphasis on prevention and integrated pest management. The home and garden can often be the first place where new plant pests are detected.

Responding to invasive pests can be expensive. The attempted eradication of plum pox virus in Ontario resulted in $190 million in expenditures between 2000-2014.

OBJECTIVE 1:
Integrated Pest Management

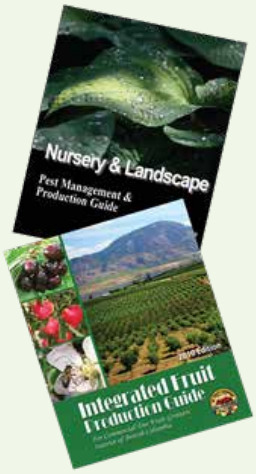
IDENTIFYING AND ADVISING ON PEST PROBLEMS USING BIOLOGICAL, CULTURAL, PHYSICAL AND CHEMICAL METHODS THAT TACKLE PEST ISSUES WHILE MINIMIZING HEALTH AND ENVIRONMENTAL RISKS

Protecting crops from pests using best management practices enhances crop quality, productivity and food safety while protecting the environment. The use and promotion of preventative practices minimizes the risk of establishment of pests that threaten agricultural crops, biodiversity and access to export markets.

Tactics and Outcomes

- Best management guides, factsheets and web pages available to B.C. producers
- Support access to safe and effective pest control products and technology for B.C. producers, including biopesticides
- Develop programs for safe and efficient application of pesticides
- Develop research programs on critical pests and pest management
- Rapid response programs including emergency use registrations
- Participation in biovigilance studies to detect trends linked to agricultural practices or new pesticides

CROP COMMODITY BEST MANAGEMENT PRACTICES GUIDES



Crop Commodity Best Management Practices Guides are important sources of information for B.C. producers. Plant Health staff, in collaboration with industry specialists, prepare up-to-date content on best management practices to produce healthy crops and manage pests.

These guides are key educational tools for producers, promoting agricultural practices that are effective, practical and environmentally sustainable. These guides support part of the Environmental Farm Plan Program series of Beneficial Management Practices.

APPLE MAGGOT

Apple Maggot *(Rhagoletis pomonella)*, first detected in the Fraser Valley of B.C. in 2006, is a serious threat to apple and pear crops. Public awareness programs are a priority of the Plant Health Unit to prevent its spread to other areas of B.C. Introduction of apple maggot to Interior fruit growing regions would result in increased pesticide use to protect the crop. This would reverse the trend of reduced insecticide use achieved by the codling moth sterile insect release program and increase production costs.

OBJECTIVE 2:
Surveillance and Pest Risk Assessment

CONDUCTING FIELD SURVEYS, LITERATURE REVIEWS AND RANKING OF PLANT PESTS

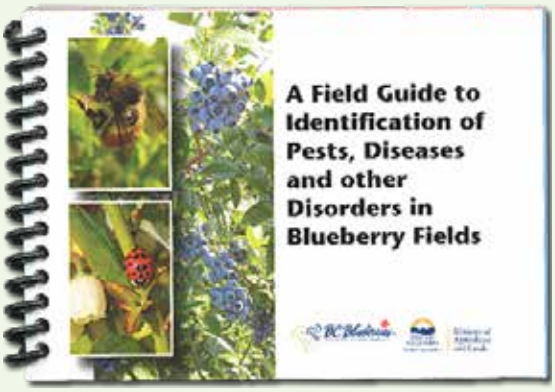
Preventing the establishment and spread of new pests and pests of quarantine significance, and monitoring changes in established pest populations in B.C. requires timely surveillance programs.

Plant pest risk assessments evaluate the probability of a critical pest being introduced and established in B.C. Assessments then evaluate the potential impact of the pest on agriculture and the environment; identify possible risk management measures; describe the risks; and provide a foundation for developing plant protection policies and programs as required.

Tactics and Outcomes

- Collection of field data on pest occurrence or absence
- Development of Pest risk assessments
- Development of pest alerts
- Make science-based information available for decision-making
- Ranked lists of plant pests

MINISTRY FIELD GUIDES



Ministry field guides aid in the surveillance, recognition and management of established and potential plant health threats. The Ministry is creating more user friendly, web format Field Guides, such as the Blueberry Field Guide below:

OBJECTIVE 3:
Diagnostics

TIMELY AND ACCURATE DIAGNOSIS OF NEW AND ESTABLISHED PESTS THAT POSE A RISK TO B.C. AGRICULTURE

Accurate and timely diagnosis of plant health problems is an essential component of Integrated Pest Management which supports the competitiveness of B.C.'s agricultural industries. Diagnostic capability is also a critical foundation supporting surveillance and regulatory mandates.

Tactics and Outcomes

- Accurate and timely diagnosis of plant pest problems
- Early detection of priority/critical plant pests
- Support surveillance and detection programs for established and emerging plant pests
- Obtain expanded laboratory space for diagnostics and increasing needs of the BC plant industry
- Development of laboratory modernisation and innovation initiatives
- Support cannabis production through diagnostic capabilities

Identification of diseases and insects by the Ministry's Plant Health Diagnostic Laboratory helps B.C.'s agricultural industries to manage their pest threats.

Blueberry submission in Plant Health Laboratory

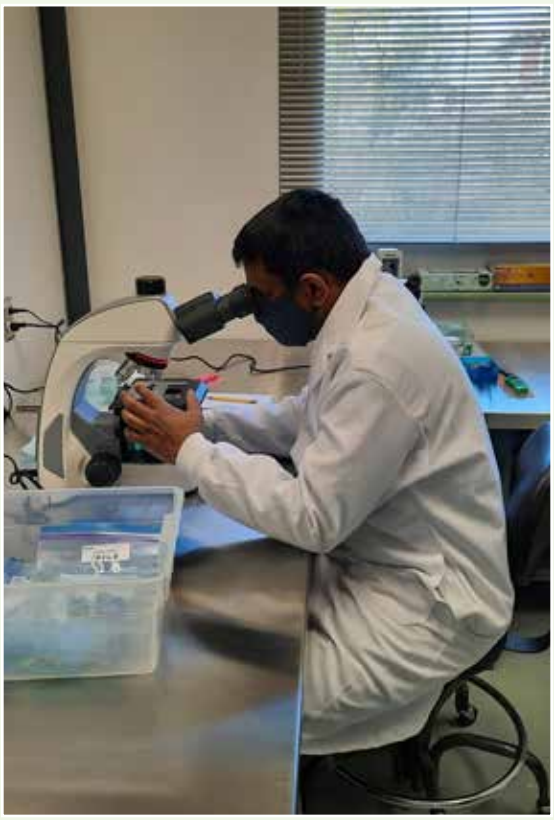
SPOTTED WING DROSOPHILA

Spotted wing drosophila (SWD) was first detected in B.C. in 2009. It is a serious pest of stone fruit and berries with high economic impact. It can cause 20-80% damage to berry crops if not managed effectively, and the Okanagan-Kootenay Cherry Growers' Association reported damage to 0.5 million kg of cherries in 2010. SWD is difficult to control and has led to increased production costs, estimated to be as high as $3.5 million annually in berry crops alone. Ministry staff continue to work with impacted industries and other government collaborators to monitor SWD populations, provide management guidelines, and seek emergency and minor use registrations.

OBJECTIVE 4:
Regulatory Framework

MODERNIZING LEGISLATION TO SUPPORT PLANT HEALTH POLICIES AND PROGRAMS

Effective programs and policies supported by appropriate legislation are essential for implementation of pest prevention, early detection, rapid response and effective plant health management programs.



Microscopic examination of plant sample submitted to the Plant Health Laboratory

Tactics and Outcomes

- Review and modernize the B.C. *Plant Protection Act* and regulations
- Contribute to modernizing other relevant legislation provincially and federally
- Build awareness of regulatory tools

PROVINCIALLY AND FEDERALLY REGULATED DISEASES

Bacterial ring rot of potato
(Clavibacter michiganensis subsp. sepedonicus)

Little cherry disease
(Little cherry virus 2)

PROVINCIALLY AND FEDERALLY REGULATED INSECTS

Blueberry maggot
(Rhagoletis mendax)

Japanese beetle
(Popillia japonica)

OBJECTIVE 5:
Climate change adaptation

INTEGRATION OF CLIMATE CHANGE ADAPTATION INTO PLANT HEALTH PROGRAMS

The Ministry of Agriculture, Food and Fisheries is supporting government's Clean BC climate action plan which puts B.C. on the path to a cleaner, better future by building a low carbon economy, protecting air, land and water and supporting communities to prepare for climate impacts. Due to the impacts of climate change on pests, the Plant Health Unit is better positioned to focus on climate change adaptation rather than climate change mitigation.

Climate change impacts plant pest cycles, making them more unpredictable. Adaptation begins with understanding local climate change impacts to pests that affect plant health and ensuring that best practices now consider climate change impacts. The Plant Health Unit has worked with Climate and Agriculture Initiative BC to develop resources for growers.

Tactics and Outcomes:

- Surveillance for distribution of new and established pests in B.C., especially due to climate change by horizon scanning, species distribution modelling and scenario planning.
- Build awareness of climate change adaptation strategies for growers.
- Conduct research to understand local climate change impacts to pests and disease that affect plant health.

PACIFIC FLATHEAD borer larva. Pest impacts can sometimes be exacerbated by hot, dry conditions.

migratory **GRASSHOPPER**

OBJECTIVE 6:
Engagement and Strategic Partnerships

COLLABORATIONS AND RELATIONSHIPS THAT ELEVATE THE PROFILE OF PLANT HEALTH IN B.C.

Plants are the foundational link in the food chain, providing sustenance for British Columbians directly through food crops and indirectly through the provision of animal feed. Good plant health contributes to food security, livelihoods, growth of small businesses and rural economic development. Awareness of the role plants play in our society will help to elevate the profile of plant health in B.C.

Effective working relationships within the ministry and with industry associations, government agencies, researchers, regulators and other stakeholders are crucial for timely decisions, rapid response and efficient use of resources to address plant pest threats. Plant health partnerships are aimed at advancing existing relationships and exploring opportunities to establish new partnerships. The Plant Health Unit has worked with Climate and Agriculture Initiative BC to develop resources for growers.

Tactics and Outcomes

- Representation on multi-stakeholder advisory bodies and working groups
- Collaborative research projects
- Communication of scientific findings
- Build awareness of plant health with government and the public, especially those developed through the Climate and Agriculture Initiative BC
- Interactions with non-traditional partners to create new opportunities in the bioeconomy

PLANT HEALTH UNIT PARTNERS INCLUDE:

- Other branches within the Ministry of Agriculture, Food and Fisheries
- Other B.C. government ministries
- Other provincial governments
- Municipal governments
- Environment Canada
- Pest Management Regulatory Agency
- Agriculture and Agri-Food Canada
- Canadian Food Inspection Agency
- Natural Resources Canada
- Industry Associations
- B.C. Agriculture Council
- Canadian Horticultural Council
- Canadian Federation of Agriculture
- Agriculture in the Classroom Foundation
- Farm and Ranch Safety and Health Association
- Private researchers and crop consultants
- Environmental Farm Planners
- CropLife Canada
- CleanFarms
- US IR-4 Program
- Education institutes in B.C.
- B.C. Centre for Disease Control
- Biocontrol Network
- First Nations
- Agribusiness
- Environmental associations
- Master Gardeners
- Climate and Agriculture Initiative BC

KEY COMMITTEES FOR THE PLANT HEALTH UNIT:

- B.C. Plant Protection Advisory Council
- Inter-Ministry Invasive Species Working Group
- Invasive Species Council of B.C.
- B.C. Integrated Pest Management Committee
- North American Plant Protection Organization (NAPPO)
- Western Forum on Pest Management
- Western Plant Board
- Federal-Provincial-Territorial Committee on Plant Health
- Minor Use Pesticide Technical Working Group
- Minor Use Commodity Committees

Successful Partnerships in Action

Applied Research – Berry Crop Diseases

BRITISH COLUMBIA IS A LEADER in North American berry production (mainly blueberries, cranberries and raspberries), contributing approximately $273 million to the economy in blueberry exports alone. Blueberries are among the top 5 exports in B.C.

Plant Health staff work closely with the berry industries to help identify research priorities, put forward research proposals, seek funding and spearhead research programs collaboratively to address the plant health challenges faced by the industries. Examples of research projects led by Plant Health Unit staff are:

Prevalence and geographical distribution of fruit rot pathogens of cranberry in the Fraser Valley and identifying effective fungicides to control them. Partnership with BC Cranberry Growers' Association.

Identifying fungicide resistant populations of Botrytis cinerea (gray mold) on berry crops in the Fraser Valley, British Columbia. Partnership with Washington State University, and BC Blueberry and Raspberry Councils.

Prevalence and distribution of Verticillium wilt of strawberry in British Columbia. Partnership with BC Strawberry Growers' Association.

BLUEBERRY scorch virus – blighted blossoms

CRANBERRY dieback disorder

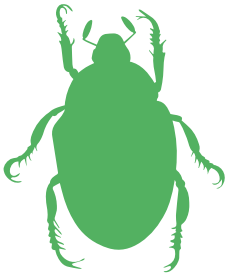
JAPANESE BEETLE

Japanese beetle (Popillia japonica) was found by the CFIA during routine monitoring in the False Creek neighbourhood of Vancouver in August 2017. Japanese beetle is an invasive, regulated pest that feeds on the roots of turf grass and foliage of more than 300 plant species including both food and landscape plants. If this pest spreads, it could cause damage to B.C.'s agricultural sector, as well as food and ornamental gardens and turf in lawns, parks, sports fields and golf courses.

Annual losses to B.C. crop production if Japanese beetle becomes established are estimated at $28 million.

The Plant Health Unit is leading a coordinated effort to eradicate the beetle before it spreads to other parts of the province. Along with the CFIA, BC Ministry of Environment and Climate Change Strategy, City of Vancouver, Metro Vancouver, Invasive Species Council of BC, British Columbia Landscape and Nursery Association and others, the cooperative program addresses:

- **Surveillance** – trapping in and around the infested area.
- **Movement Controls** – a regulated area has been established within Vancouver where restrictions have been placed on the movement of plant materials, landscape waste and soil. These restrictions apply to everyone, including homeowners, renters, landscape companies, retailers and construction companies.
- **Treatments** – The larvicide Acelepryn is being applied to both public and private treatment zones within the regulated area.



Adult **JAPANESE BEETLE** feeding on foliage

Japanese beetle can cause significant crop losses to commercial horticulture and forage crops. In response, producers will have to spend more on pest monitoring and treatment to manage the threat. Overall, potential crop damage caused by the beetles is estimated to cost producers $14.5 million (excluding damage to golf courses). In addition to direct crop damage, nurseries in British Columbia will need to meet costly certification requirements to export into unregulated states in the US.

APPLIED TRAINING WORKSHOPS – PESTICIDE SPRAYER CALIBRATION

Pesticides are part of the agriculture industry in British Columbia whether you are farming organically or conventionally. To ensure that the product is applied to the target, rather than drifting off the intended target, sprayers need to be calibrated correctly. For many growers, sprayer calibration is thought to be a complicated process involving numerous mathematical calculations. And while airblast sprayers used in orchards, vineyards and berry crops, do require more attention to calibration than other types of sprayers, the process does not need to be complicated – a GPS speed indicator, automated flow rate device and some knowhow are usually all that is required.

Every year, the Ministry of Agriculture, Food and Fisheries receives complaints from the public concerned about pesticide drift. Through roundtable discussions with growers, a need for more personnel to assist growers in calibrating their equipment was highlighted. To fill this need, Plant Health Unit staff partnered with the Okanagan College in 2020 to hold two pilot workshops to train participants not only in sprayer calibration but also in how to host a sprayer calibration workshop to increase the number of trained personnel in the field that can assist growers in getting their equipment properly calibrated. Plans are in place to have these workshops as an annual event.

Plant Health Unit staff providing hands-on training on how to calibrate a sprayer

PESTICIDE APPLICATION WORKSHOPS

The development of pesticide application workshops by the Plant Health Unit demonstrate innovative application technologies and practices that contribute to environmental protection, positive urban/rural relationships, cost savings, food safety and effective pest management.

PROFESSIONAL DEVELOPMENT

Plant health staff attend technical and scientific conferences and workshops to improve their skills and knowledge. New knowledge is shared with clients in an interactive process that enables staff to receive feedback on plant health issues and effectiveness of pest management tools and technologies.

Noteworthy achievements during the last Plant Health Strategy 2013-2018

THE FOLLOWING IS A LIST OF ACHIEVEMENTS by the Plant Health Unit during the period of the previous Plant Health Strategy 2013-2018. The achievements are categorized according to the Plant and Animal Health Branch objectives.

1. Improve the state of plant and animal health through diagnostic excellence

- Diagnosed 4,456 plant pest and pathogen samples submitted to the Plant Health Lab in Abbotsford by growers, crop consultants and staff.

2. Identify and understand pest and disease patterns with the goal of minimizing the likelihood of an outbreak, as well as minimizing the impacts of plant and animal health threats

- Led the provincial response to emerging issues and outbreaks of plant pests and pathogens such as western yellowstriped armyworm, fruit rot pathogens of cranberry, Verticillium wilt of strawberry, brown marmorated stink bug, spotted wing drosophila, grasshopper, balsam woolly adelgid, and flatheaded borer.
- Accessed $1.1M in applied research funding from the federal government's Canadian Agricultural Partnership to address industry concerns arising from brown marmorated stink bug, western yellowstriped armyworm, spotted wing drosophila, fruit rot pathogens of cranberry, gray mold on berry crops, and Verticillium wilt of strawberry.

3. Improve the state of knowledge with respect to provincial plant and animal health

- Published 35 factsheets on plant pests and pathogens ranging from managing eastern filbert blight in hazelnut to western yellowstriped armyworm in alfalfa and vegetables.
- Provided information on biology, distribution, impacts, surveys and research related to BC, and prevention and management approaches.
- Contributed to the body of knowledge in plant pathology and entomology by co-authoring 8 publications in peer-reviewed journals.
- Developed and delivered 275 presentations on insect pests and diseases of agricultural crops including emerging pests of economic concern, information on pest biology, distribution, impacts, surveys, research, prevention and management approaches.

4. Support the socially responsible development of British Columbia's agricultural sector

- Participated in environmental farm planning.
- Management and surveillance of plant pests had co-benefits for biodiversity.
- Facilitated access to Integrated Pest Management strategies, where chemical control was a last resort.
- Provided guidance on the management and use of pesticides in agriculture to enhance environmental stewardship, worker protection, urban/agriculture relationships, and food safety.

5. Support the Ministry's food quality and food safety objectives through diagnostic, research, and regulatory enforcement excellence

- Submitted 50 minor use label expansions for crops such as raspberries, grapes, cherries, cannabis, potatoes and greenhouse vegetables and ornamentals.
- Applied for and received emergency use registrations for:
  - different fungicides to manage pathogens on potatoes, basil, cranberries, wasabi and hops
  - multiple insecticides to manage spotted wing drosophila on cherries, peach, plum, apricots, raspberry, blackberry, blueberry, currants and strawberries

FOR MORE INFORMATION CONTACT:

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Appendix 1: *Definitions*

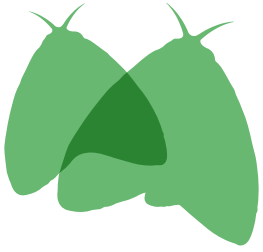
Bioeconomy: The production of renewable biological resources and their conversion into value-added products such as food, bioenergy and other products.

Biopesticide: Biopesticides are naturally derived pest management chemicals and agents (derived from natural sources such as fungi, bacteria, viruses, plants, animals and minerals) that can provide an alternative to synthetic chemicals in crop production systems. Biopesticides are registered by Health Canada's Pest Management Regulatory Agency. There are 3 types of biopesticides: microbial, semiochemical and non-conventional.

Biovigilance: The study of unintentional effects on pest populations, climate change, ecological services and biodiversity. These effects may occur as a result of agricultural practices, or new plant protection products.

Integrated Pest Management: A systematic decision-making process that supports a balanced approach to managing crop production systems for the effective, economical and environmentally sustainable suppression of pests.

Invasive alien species: Non-native or foreign disease-causing organisms that have been introduced and cause negative impacts to agriculture or natural ecosystems.



Nematode (plant parasite): Microscopic roundworms that feed on plants and are found in the soil, in plant roots and/or other plant parts.

Noxious weed: Plant species currently regulated under the provincial Weed Control Act, either on a regional or provincial basis, and which must be controlled on both private and public land.

Pesticide: Any kind of synthetic or naturally derived material that is used to kill, control or manage pests or weeds. Pesticides include insecticides, fungicides, herbicides, bactericides, nematicides, rodenticides, miticides, avicides, molluscicides, microbials, semio-chemicals, and other non-conventional pest control products. Also see Biopesticide.

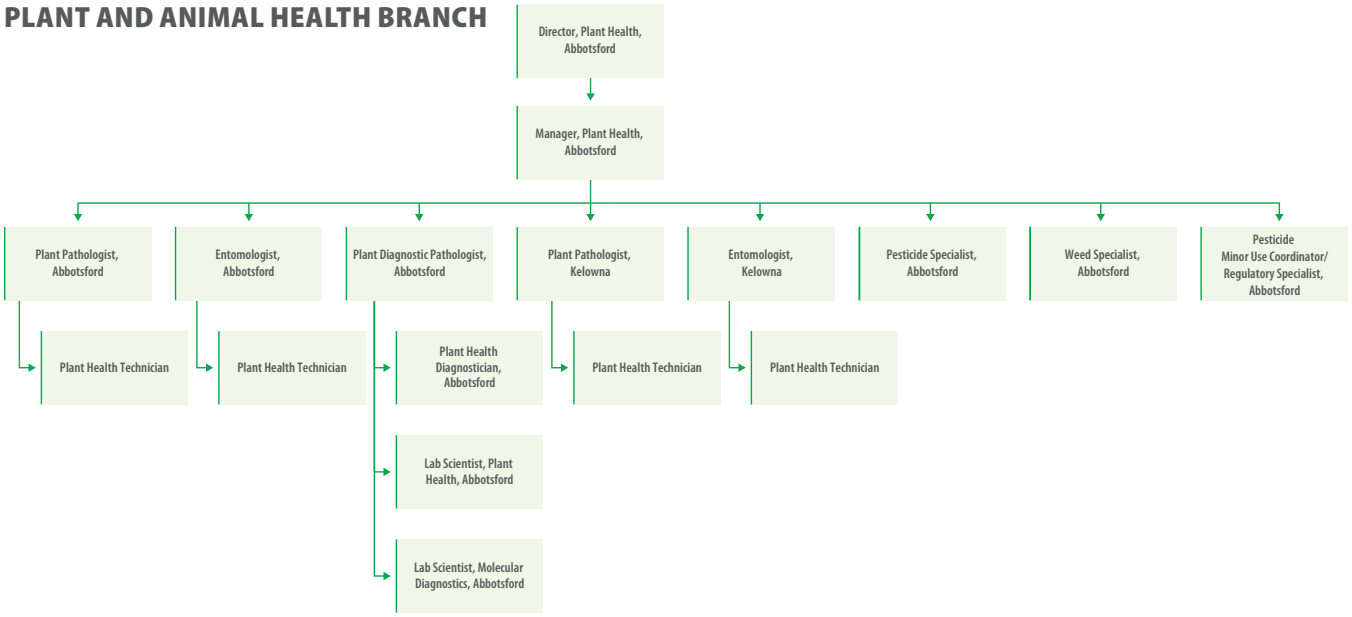
Pest: A plant pest is any biotic factor such as insect, mite, nematode, fungus, bacterium, virus, viroid, mycoplasma, animal (slug, snail etc.) and terrestrial and aquatic plants that may cause direct or indirect injury to a plant.

Plant health: The discipline of preventing and controlling plant pests including the scientific and regulatory framework of risk assessments and inspecting for regulated pests.

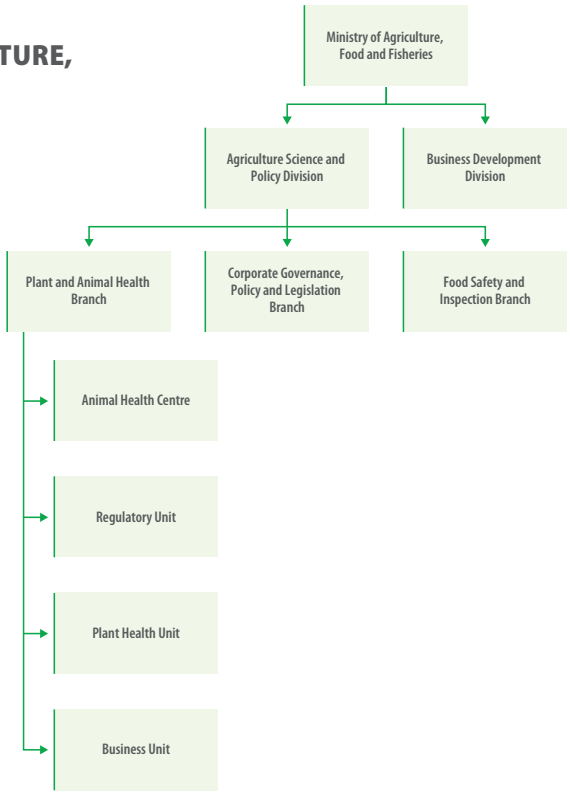
Quarantine: Legal restriction in the movement of plants (and animals), plant products, and plant-associated material to prevent the introduction and spread of pathogens, insects and non-native plants.

Appendix 2: *Organization Charts*

PLANT HEALTH UNIT
PLANT AND ANIMAL HEALTH BRANCH



LINKAGE TO THE MINISTRY OF AGRICULTURE, FOOD AND FISHERIES

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