British Columbia
Plant Health Strategy
for Agriculture
2013-2018

Plant Health Unit
Plant and Animal Health Branch
Ministry of Agriculture
Cover Images

Top row, left to right
- Colorado potato beetle
- Gummy stem blight on squash
- Anthracnose on blueberries
- Brown marmorated stink bug. Photo courtesy David R. Lance, USDA APHIS PPQ, Bugwood.org

Bottom row, left to right
- Grapevine leafroll virus symptoms
- Apple curculio on saskatoon berry
- Fusarium colony in Petri dish
- Apple clearwing moth
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Executive Summary

A strong, viable agri-food industry in British Columbia relies on the production of safe and healthy crops and agri-food products. Established and potential invasive and regulated plant pests (e.g. insects, mites, fungi, bacteria, viruses, nematodes and weeds) directly affect the competitiveness of agricultural and agri-food industries by reducing crop yield and quality, increasing the cost of production, and by the loss of market access due to the presence of regulated invasive species.

Government has a legitimate role to protect the economy, the environment and the capacity of our agricultural and natural land resource from the negative impacts of plant pests that may establish in B.C. Since 1888, the Province of B.C. has worked to protect these public needs through legislation, surveillance, management programs, targeted funding and education/awareness. The Plant Health Unit in the Plant and Animal Health Branch, Ministry of Agriculture, identifies, prioritizes and addresses plant health issues using a strategic, science-based approach. The Plant Health Unit is staffed by professionals in plant pathology, entomology and pesticide management, supported by crop specialists and agrologists in other Ministry branches.

This document outlines a five-year Plant Health Strategy identifying key goals, objectives, critical success factors and targeted actions that, undertaken collaboratively, will enable the Plant Health Unit to achieve its mission. The goals are based on the principles of Integrated Pest Management and the Ministry’s legislative mandate related to the Plant Protection Act. Our professional staff achieve these goals through collaboration with partners such as government, industry and communities. The mandate of the Plant Health Unit as identified in this Plant Health Strategy supports the B.C. AgriFood Strategy (2012), which directly links to Canada Starts Here: The B.C. Jobs Plan.

The table Strategic Plan Summary on page 3 summarizes key plant health goals and outcomes and how they relate to Ministry goals and objectives.

The Plant Health Unit is responsible for the implementation of this strategy. This will require strong leadership, scientific expertise, access to resources, and effective partnerships that identify and build on common objectives between and within government agencies and the agri-food industry.

June, 2013
## Strategic Plan Summary

### Ministry Goals and Objectives

<table>
<thead>
<tr>
<th>Key Plant Health Outcomes</th>
<th>Innovative Pest Management Delivery Systems</th>
<th>Surveillance and Pest Risk Analysis</th>
<th>Diagnostics</th>
<th>Governance</th>
<th>Strategic Partnerships</th>
</tr>
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<tbody>
<tr>
<td>Agriculture and food sectors contribute positively to the economic diversity and well-being of the Province</td>
<td>World-leading environmental stewardship practices in the agriculture and food sectors.</td>
<td>Community and social well-being is enhanced by agriculture and food sector practices.</td>
<td></td>
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<tr>
<td>- A sustainable agriculture and food sector</td>
<td>- Effective management of environmental risks in agriculture and food sectors</td>
<td>- Promote a positive urban/agriculture relationship to facilitate sustainable growth for farms while enhancing the overall quality of life for British Columbians</td>
<td></td>
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<tr>
<td>- Strategic growth and development of the agriculture and food sector</td>
<td>- Sustainable agriculture management practices that assist successful adaptation to climate change</td>
<td>- Animal, plant and human health are safeguarded</td>
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### Key Plant Health Outcomes

- Current information resources on pest management including best management guides, factsheets and web pages available to B.C. producers.
- Access to safe and effective pest control products and technology for B.C. producers.
- Priority pest management research needs addressed.
- Pest awareness programs to reduce the risk of introduction and spread of critical plant pests.
- Effective rapid response programs.
- Programs that facilitate safe and efficient application of pesticides.
- Availability of pesticide stewardship programs.

### Innovative Pest Management Delivery Systems

- Effective, innovative and sustainable measures and practices to prevent or minimize the impact of plant health threats.

### Surveillance and Pest Risk Analysis

- Prioritization and documentation of critical plant pests that threaten B.C. agriculture.
- Complete, science-based information on critical pests available for decision making.
- CFIA Pest Risk Assessments address B.C.’s unique pests, crop diversity and climate.
- Current data on the distribution of new and established pests in B.C.
- Annually updated lists of critical pests that threaten B.C. agriculture.

### Diagnostics

- Accurate and timely diagnosis of plant pest problems.
- Early detection of priority/critical plant pests.
- Expanded knowledge of the nature, occurrence and distribution of critical plant pests in B.C.
- CFIA Pest Risk Assessments address B.C.’s unique pests, crop diversity and climate.
- Annual plant laboratory diagnostic reports.
- Laboratory database system that meets client and Ministry needs.
- Active engagement in PNW Diagnostic Group.
- Implementation of the Plant Health Laboratory Strategy and standardized QA system.

### Governance

- Effective plant health policies and programs supported by appropriate legislation.
- Relevant Provincial Plant Protection Act and Regulations.
- Legislation, policies and programs of other agencies (federal, provincial, municipal) address B.C.’s pest management needs and initiatives.
- Priority pest threats are addressed.
- Effective early detection and rapid response programs.

### Strategic Partnerships

- Effective, innovative networks and collaborations that address plant health in B.C.
- Cooperative projects with industry and other agencies.
- Representation on multi-stakeholder advisory bodies and working groups.
- Participation in industry forums.
- Strong collaboration with CFIA and other agencies.
- Strong international, national and local networks for detecting and addressing plant health issues.
- Partners are well informed about B.C.’s plant health issues.
- Minor use pesticide priorities negotiated with federal, provincial and industry partners.

*B.C. Ministry of Agriculture Plant Health Strategy*
**Introduction**

British Columbia’s agri-food industry is an important contributor to the provincial economy, generating close to $11.6 billion in total revenues annually and providing more than 61,000 jobs. High land values in combination with B.C.’s unique climate have resulted in an agriculture industry founded upon diverse, high value commodities; as a result B.C. has the most diverse agriculture industry in Canada producing more than 225 farm commodities. With this diversity comes the risk of equally diverse pest threats, some that may be unique to B.C.

The viability of the agriculture sector and successful establishment of new crops is determined, in part, by the industry's ability to manage critical pest threats effectively. 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 overall economic viability.

Invasive alien pest incursions pose new threats for the sector until proven management protocols are established. Challenges include a lack of effective control measures, the disruption of existing pest management programs, reduced environmental sustainability/biodiversity and the potential for lost export markets due to quarantine measures and regulatory restrictions.

An innovative, strategic and science-based approach is used to prioritize and address the plant health risks and issues that affect productivity, environmental sustainability, human health and competitiveness of agricultural crops in B.C. This document outlines the five year Plant Health Strategy based on this approach which will direct the protection and production of healthy crops in B.C. through 2018.

This strategy incorporates the concepts of Integrated Pest Management (IPM), a systematic decision making process that supports a balanced approach to managing agricultural production systems for effective, economically viable and environmentally sustainable management of plant pests.

The 2013 – 2018 Plant Health Strategy identifies 5 goals which are supported by 15 objectives and 38 targeted actions. The goals build upon the opportunities outlined in this strategy and the Ministry’s legislative mandate related to plant health. This strategy describes each goal, outlines the key objectives and lists the actions planned to attain the goals and objectives. Outcomes and critical success factors are also specified under each goal.

The Plant Health Unit is responsible for the implementation of the strategy. This will require strong leadership, scientific expertise, access to resources, and effective partnerships that identify and build on common objectives between and within government agencies and agri-food industry.

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**Plant Industry Commodity Values**

Farm Cash Receipts, 
Approximate total: $1.2 Billion

**IPM incorporates:**

- planning and managing ecosystems to prevent organisms from becoming pests
- identifying pest problems and potential pest problems
- monitoring populations of pests, beneficial organisms, pest damage and environmental conditions
- using thresholds to make treatment decisions
- suppressing pest populations to acceptable levels using strategies that consider biological, physical, cultural, mechanical, behavioural and chemical controls in appropriate combinations as well as environmental and human health protection
- evaluating the effectiveness of pest management treatments
Plant Health Unit

The Provincial Government has a long history of providing leadership, scientific support and coordination to agri-food industries for the promotion of plant health and the production of safe, high quality products from sustainable agri-food systems.

The Plant Health Unit, one of three units 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 (see appendix 2, organization charts). Staff facilitate the development, implementation, maintenance and evaluation of integrated pest management practices and products to mitigate the impact of plant diseases and insect pests; diagnose plant health problems, monitor for and address pest outbreaks including established, non-native and invasive species; make policy recommendations on plant health issues; administer the provincial Plant Protection Act and provide guidance on the management of pesticides.

The Ministry’s Plant Health Strategy is also supported in part by 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.

Mission

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

Highlights of B.C.’s Plant Protection History

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

Other Legislation:

Many other municipal, provincial, federal, and international regulations may impact 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 was transferred from the Ministry of Agriculture to the Ministry of Forests, Lands and Natural Resource Operations (FLNRO) in 2011.

Key Legislation Affecting 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

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

International
- International Plant Protection Convention

Pests Regulated under the B.C. Plant Protection Act
- Bacterial ring rot
- Balsam woolly adelgid
- Blueberry maggot
- Golden nematode
- Little cherry virus
- Pear trellis rust
- Gypsy Moth
Linkage to the Ministry of Agriculture 2012/13 – 2014/15 Service Plan

This Plant Health Strategy primarily supports the Ministry’s Service Plan goal: “Community and social well-being is enhanced by agriculture and food sector practices.” The Plant Health Unit takes a lead role implementing the plant health component of the objective: “Animal, plant and human health are safeguarded” particularly as it relates to the early detection and response to plant pests.

The Ministry’s second Service Plan goal: “World-leading environmental stewardship practices in the agriculture and food sectors” is also supported by activities of the Plant Health Strategy, including promoting integrated pest management, providing guidance on the management and use of pesticides, and facilitating access to pest management tools including reduced risk pesticides.

The Ministry’s third Service Plan goal: “Community and social well-being is enhanced by agriculture and food sector practices” is supported by targeted awareness building and finding and facilitating solutions to issues related to possible and perceived conflicts involving normal agricultural practices, urban agriculture and urban expectations of agriculture.

Plant Health Unit staff work closely with Ministry specialists, as well as other Ministries and external stakeholders to implement the strategy’s objectives, which enable the B.C. agriculture industry to produce healthy, competitive and profitable crops using environmentally sustainable practices.

Linkage to the B.C. Agri-Food Strategy

The B.C. Agri-Food Strategy 2012 calls for actions that promote and enable a globally-competitive agri-food industry. The goals and actions outlined in the strategy are founded on an agri-food industry that produces a safe, secure food supply.

Key Activities supporting 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 timely and accurate diagnostic services for plant pests
- 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.

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.

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.
Plant Health Challenges and Opportunities

Challenges to plant health are numerous and complex. These include both direct threats to crops and market access, as well as the challenges to mitigate threats. The cost to manage infestations can be in the millions of dollars. Therefore, strategies aimed at prevention are usually more cost effective than those aimed at managing new pests. In addition, a strong science-based foundation is essential for effective decision making to facilitate the development and implementation of fiscally responsible innovative delivery systems.

Threats from New Pest Introductions
Globalization is increasing the threat from new invasive species. Identifying priority pest issues, and taking steps to mitigate the risks, strengthens our ability to protect B.C.’s environment and the competitiveness of our agriculture industry.

Climate Change
Climate change is expected to increase the risk of establishment and spread of plant pests. Altered temperature and precipitation profiles will result in changes to the range of many insects, diseases and weeds, and may disrupt populations of native beneficial insects and microorganisms. Extreme weather events have the potential to introduce new pests from distant areas. Although it is challenging to prepare for risks that are difficult to predict, it will be important to facilitate adaptive practices to mitigate problems caused by climate change.

Access to Research and Extension
Capacity to address plant health issues has declined both inside and outside the Ministry. Researchers are instrumental in finding solutions to manage new and existing pest threats. Extension activities are essential to transfer new technologies to the 15,000 crop farms in B.C. and enhance industry self reliance. Knowledgeable growers with access to research resources have the capacity to be more productive and competitive. New, creative approaches are needed to address these challenges.

Gaps in Plant Health Expertise
Two gaps in expertise within the Ministry of Agriculture that are a priority for the Plant Health Unit include:

Weed Management: Transfer of the Weed Control Act and program resources to FLNRO in 2010 eliminated the Ministry of Agriculture’s weed management expertise and capability. FLNRO’s mandate for management of invasive plants on Crown land, policy development and administration of the Weed Control Act does not include support for weed management in agricultural systems. Weed expertise is required to help industry address threats from existing and new weeds, develop and deliver sustainable best management practices, and to enable B.C. to negotiate for minor use and emergency herbicide registrations that address industry needs.

Application Technology: Advances in application technology for pesticides provide many advantages including a reduction in off-target drift, reduced application volumes, and increased application efficiency, resulting in improved pest management practices and reduced impacts to the environment. Knowledge of new and innovative equipment, including calibration and maintenance is needed to provide education and advice to industry.

Invasive Pest Impacts
Eradicating invasive pests can be very costly. For example, federal expenditures on attempted eradication of Plum pox virus in Eastern Canada exceeded $100 million between 2000 and 2011.

The Importance of Weed Management in Agriculture
Agricultural weeds account for the greatest economic impact of all pests, negatively impacting productivity and competitiveness. Crop losses caused by weeds in British Columbia were estimated to exceed $50 million per year in 1992.

Total expenditures on invasive plant management by the province and local government/weed committee partners was approximately $6 million in 2012-13. (Inter-Ministry Invasive Species Working Group).

An analysis of economic impacts of just 6 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.

Leafy spurge (Euphorbia esula), a provincial noxious weed
Capacity for Pest Surveillance
Resource constraints limit the capacity for surveillance. Undetected pests may become established in B.C. and threaten agricultural crops and the environment. Expanded surveillance networks (i.e. enlisting the gardening public to look for pests), expertise, pest risk assessments and access to improved diagnostics will aid in early detection.

Capacity for Rapid Response
Not addressing new pest introductions before they become established may cause negative impacts to B.C.’s agriculture and ecosystems. Improved coordination and rapid response prevents pest establishment, crop losses and maintains current markets.

Access to Pest Control Tools and Practices
B.C. producers need access to more safe and effective tools and practices to manage pests. Improving access to effective pest management tools including pesticides, biopesticides and resistant varieties will help B.C. growers compete in domestic and global markets, effectively manage pests and implement pesticide resistance management strategies.

Compensation
Farmers whose products are destroyed due to the detection of quarantine pests are not fully or automatically compensated for losses. An equitable and consistent policy for producer compensation would enhance industry participation in early detection and effective management of regulated pests.

Changing Social Values
Public concern about pesticides, an increased focus on the environment, and urban/rural conflicts can influence pest management practices, including the availability of critical tools to manage new invasive pests. Public pressure to restrict access to pest management tools needs to be balanced with science-based decision making. Increased public interest and awareness provides an opportunity to enlist the public in pest surveillance, develop niche markets, encourage the agricultural community to adopt environmentally sustainable pest management practices and promote B.C. produce as a healthy food choice.

Professional Development and Succession Planning
Effective implementation of the Plant Health Strategy will require professional, knowledgeable staff with well developed networks. Support for professional development, including scientific forums, technical conferences and workshops, is critical to maintaining a high level of skill, competency and knowledge necessary for protection of plant health in B.C. Development and implementation of a succession planning strategy for the Plant Health Unit is needed to provide consistent, high level performance into the future.

The Field Guide to Invasive Alien Plant Pests and Diseases that Threaten B.C. Agriculture provides information to master gardeners, agrologists and other professionals on detection of over 80 potential invasive insects and plant pathogens.

Pesticide Application Workshops
The development and presentation of pesticide application workshops 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.
**Goal 1. Innovative Pest Management Delivery Systems**

**Effective, innovative and sustainable measures and practices to prevent or minimize the impact of plant health threats**

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.

**Key Objectives**

- Development adoption, and delivery of pest management practices that minimize crop damage by pests, protect the environment and enhance the sustainability of B.C. agriculture
- Access to pest management information and tools including pest management strategies, pesticides, biological controls, and cultural practices for B.C. producers and urban agriculture.
- Support local commercial and personal food production

**Critical Success Factors**

- Capacity and infrastructure to provide services to B.C.’s crop producers
- Cooperation and commitment of partners such as governments, grower associations, educational institutions and agribusinesses
- Access to current scientific and technical information
- Access to federal, provincial and industry funding and support

**Key Actions**

- Develop and provide current pest management information
- Generate pest management data and adapt IPM programs for B.C. agriculture
- Identify and facilitate research on pest management in support of made in B.C. solutions
- Encourage research and registration of crop protection tools
- Facilitate the implementation of rapid response programs to prevent the establishment and spread of invasive plant pests
- Provide access to quality pest management information on the Ministry’s plant health website
- Coordinate, and submit minor use and emergency use pesticide registration requests to Health Canada
- Develop and implement a sprayer inspection and calibration program.
- Encourage pesticide stewardship programs

**Outcomes**

- Current information resources on pest management and pest management technology, including best management guides, factsheets and web pages available to B.C. producers.
- Access to safe and effective pest control products and technology for B.C. producers.
- Priority pest management research needs addressed
- Pest awareness programs to reduce the risk of introduction and spread of critical plant pests
- Effective rapid response programs.
- Program that facilitates safe, effective and efficient application of pest control products.
- Availability of pesticide stewardship programs.
Goal 2. Surveillance and Pest Risk Analysis

Prioritization and documentation of critical plant pests that threaten B.C. agriculture

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. These programs engage all stakeholders including the public, trained staff, a well equipped diagnostic laboratory and collaborative extension programs.

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

Key Objectives

- In-depth knowledge about potential, emerging and established pests that threaten B.C. agriculture, including pest risk assessments, pest prevalence and management strategies.
- Determine B.C.’s most critical agricultural plant pest priorities.
- Development and implementation of a coordinated surveillance network for early detection of plant pests.

Critical Success Factors

- Resources to complete and maintain crop profiles and pest risk assessments
- Access to current information, including library resources, regulatory/quarantine measures and protocols, pest risk assessments and pest distribution maps.
- Participation in regional, provincial, national and international forums on invasive plant pests
- Effective communication and cooperation with industry and other government agencies
- Effective executive level partnerships with provincial and federal agencies

Key Actions

- Conduct and facilitate active and passive surveillance for potential, emerging and established plant pests that threaten B.C. agriculture
- Conduct pest risk analyses, using appropriate risk analysis methodologies
- Maintain a list of key critical plant pests, including both potential and established species, threatening agriculture in B.C.
- Collaborate with the CFIA on timely detection and risk mitigation of pests of regulatory significance
- Complete and maintain crop profiles for B.C. crops as required
- Consult with other provinces and PNW states on critical pest issues
- Facilitate the ability of industry associations to prioritize plant health needs
- Develop information resources to aid recognition of significant plant pests
- Engage the public in pest surveillance

Outcomes

- Current data on the distribution of new and established pests in B.C.
- Annually updated lists of critical pests that threaten B.C. agriculture
- Complete, science-based information on critical pests available for decision making
- CFIA Pest Risk Assessments address B.C.’s unique pests, crop diversity and climate

The Apple Maggot - Priority Invasive Pest

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.

Ministry field guides aid in the surveillance, recognition and management of established and potential plant health threats.
Goal 3. Diagnostics

Timely and accurate diagnosis of new and established pests that pose a significant 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.

Key Objectives
- Timely, accurate, state-of-the-art diagnostics for B.C.’s established and emerging plant health problems
- Continually enhance pest diagnostic capacity in B.C.
- Understand the distribution of key pests in B.C.
- Support surveillance and detection programs for established and non-established invasive pests.

Critical Success Factors
- A well equipped laboratory facility
- Resources, information technology services and expertise for critical upgrade of the Plant Health Laboratory database
- Cooperation, coordination and communication with key partners
- Availability of resources and training for staff
- Access to current science information

Key Actions
- Provide accurate, timely diagnosis of plant health problems
- Identify and enhance diagnostic capacity to support pest surveillance programs and initiatives
- Maintain reference collections
- Maintain a comprehensive database for recording plant pest diagnoses
- Provide comprehensive and periodic reporting and communication on plant health diagnostics
- Collaborate with other agencies on pest diagnostics and surveillance
- Provide laboratory support for applied research and surveillance initiatives
- Improve efficiency of lab processes, sample flow and administration through the LEAN initiative
- Implement the Plant Health Laboratory Strategy
- Preparation and implementation of Quality Assurance system aligning with ISO 17025

Outcomes
- Accurate and timely diagnosis of plant pest problems
- Early detection of priority/critical plant pests
- Expanded knowledge of the nature, occurrence and distribution of critical plant pests in B.C.
- Cooperative research projects
- Annual plant laboratory diagnostic reports
- A laboratory database system that meets client and Ministry needs
- Active engagement in PNW Diagnostic Group
- Implementation of the Plant Health Laboratory Strategy and standardized QA system

Identification of insects and diseases by the Ministry’s Plant Health Diagnostic Laboratory helps B.C.’s agricultural industries to manage their pest threats
**Goal 4. Governance**

Effective plant health policies and programs supported by appropriate legislation

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.

**Key Objectives**
- Strengthen B.C.’s ability to manage plant health issues through development and implementation of innovative solutions and approaches
- Administer the B.C. Plant Protection Act and Regulations
- Influence federal, provincial and local policies, programs and legislation that impact B.C.’s plant health issues

**Critical Success Factors**
- Effective cooperation and communication with partners
- Sufficient resources to participate in key multi-agency advisory committees
- Ability to enact essential regulation in a timely manner
- Access to Growing Forward 2 funding

**Key Actions**
- Develop strategic approaches to manage specific plant health issues
- Participate on multi-agency advisory committees
- Review and respond to federal, provincial and local policy, program and legislative proposals on pest/pesticide management
- Review and update the B.C. Plant Protection Act and regulations
- Encourage federal and provincial policy, program and legislative changes that improve access to environmentally sustainable pest management technologies

**Outcomes**
- Relevant Provincial Plant Protection Act and Regulations
- Legislation, policies and programs of other agencies (federal, provincial, municipal) address B.C.’s pest management needs and initiatives
- Priority pest threats are addressed
- Effective early detection and rapid response program

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**Gypsy moth**,* Lymantria dispar*, is a serious invader from eastern North America (European origin) and Asia (Asian origin) that threatens many of our native, agricultural and forest plant species. Gypsy moth is regulated under the federal and provincial Plant Protection Acts. Provincial ministries of Forests, Lands and Natural Resource Operations, Environment, and Agriculture, in cooperation with the Canadian Food Inspection Agency and Natural Resources Canada, participate in surveillance and eradication measures to prevent establishment of gypsy moth in B.C.

**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.
Goal 5. Strategic Partnerships

Effective, innovative networks and collaborations that address plant health issues in B.C.

The responsibility for many plant health issues is shared among different jurisdictions. 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 initiatives are aimed at advancing existing relationships and exploring opportunities to establish new partnerships.

Key Objectives

- Build and maintain partnerships with government and non-government stakeholders, to address B.C.’s plant health needs
- Effective communication with partners

Critical Success Factors

- Resources to build and maintain networks with key partners
- Cooperative partners that provide timely information on plant health issues
- Active participation in plant health related committees and councils both within B.C. and elsewhere.
- Clear understanding of partners’ roles and responsibilities
- Ability to respond to partners’ requests

Key Actions

- Participate in regional, provincial, national and international forums that influence plant health
- Maintain strong connections with industry associations
- Strengthen and expand key partnerships with government agencies and universities to ensure research, surveillance and related programs that are practical, coordinated, and meet B.C.’s agriculture needs
- Support the training and development of plant health professionals
- Exchange of information with partners

Outcomes

- Cooperative projects with industry and other agencies
- Representation on multi-stakeholder advisory bodies and working groups
- Participation in industry forums
- Strong collaboration with CFIA and other agencies.
- Strong international, national and local networks for detecting and addressing plant health issues
- Partners are well informed about B.C.’s plant health issues
- Minor use pesticide priorities negotiated with federal, provincial and industry partners.

Partners Include:

- Other branches within the Ministry of Agriculture
- 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 & Ranch Safety & 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

Key Committees:

- 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 Plant Board
- Federal-Provincial-Territorial Committee on Pest Management and Pesticides
- 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, contributing over $200 million to the economy, chiefly from blueberries, cranberries and raspberries. Ministry staff work closely with the berry industries to help identify research priorities, prepare research proposals, seek funding and spearhead research projects to address the challenges imposed by plant pathogens.

A few examples of research projects led by Plant Health Unit staff are,

- Detection, epidemiology, and disease management strategies for Blueberry scorch virus, Godronia canker and Phomopsis on blueberry
- Identification and confirmation of plant pathogens responsible for cranberry dieback disorder and disease management options.
- Impact of soil-borne plant pathogens on raspberry decline

Minor Use Committees

The Plant Health Unit facilitates the development and operation of commodity-based minor use committees which bring together industry, provincial and federal representatives to effectively prioritize plant health needs and work towards potential solutions through minor use pesticide registration. Reduced-risk products are chosen where possible.

Forging strategic partnerships to increase access to reduced-risk pesticide products at the Minor Use Pesticide Registration Priority Setting Meeting

Pesticide Stewardship Programs

Pesticide stewardship programs, such as the CleanFarms B.C. Obsolete Pesticide Collection Campaign, that were initially operated by government are now industry led programs. Government continues to provide technical advice and participates on steering committees.

Obsolete Pesticide Collection Site
Implementation

The Plant Health Strategy will provide a roadmap for the Plant Health Unit for the next 5 years. It outlines key goals and activities that are both new and ongoing. The strategy will be used to help prioritize resources and activities that support the Ministry’s plant health objective to safeguard animal, plant and human health.

The Plant Health Strategy also outlines constraints and opportunities including critical success factors for each goal. Achieving all of the objectives in this strategy will require additional resources, cooperative arrangements with partners and new creative approaches to old and new plant health problems.

Effective implementation of the Plant Health Strategy requires professional, knowledgeable staff with the ability to establish necessary linkages within and outside the Ministry, create innovative solutions, and facilitate the delivery of programs. Plant Health staff must maintain their professional skills and knowledge as well as keep internal and external clients informed of challenges, opportunities and achievements.

For More Information:

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Appendix 1: Definitions

**Biological Control**
The use of living organisms such as insects, bacteria, fungi or viruses to control a target disease, insect or plant.

**Biopesticide**
Biopesticides can be grouped into the following categories:
1. Microbials - naturally occurring or genetically altered microorganisms to which the effects of pest control are attributed
2. Semiochemicals – a message-bearing substance produced by plants and animals or a functionally identical synthetic analogue of that substance which evokes a behavioural response in individuals of the same or other species (e.g. pheromones);
3. Biochemicals – as derived from naturally occurring substances by simple processing, or functionally identical synthetic analogues;
4. Other non-conventional pest control products not covered by the previous categories such a food and feed stuffs which are inherently low toxicity to non-target organisms and have low persistence in the environment

**Globalization**
The increased interconnectedness and interdependence of people and countries, including the opening of borders to increasingly fast flows of goods, services, finance, people and ideas across international borders and the changes in institutional and policy regimes at the international and national levels that facilitate or promote such flows.

**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, insects or plants that have been introduced and cause negative impacts. Also referred to as invasive species.

**Nematode (plant parasitic)**
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 to manage the growth of plants. Pesticides include insecticides, fungicides, herbicides, nematicides, rodenticides, miticides, avicides, molluscicides, microbials, semiochemicals, plant growth regulators, and other non-conventional pest control products. Also see Biopesticide.

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

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

**Reduced-risk pesticide**
A special category of pesticide designated by the Pest Management Regulatory Agency. A reduced risk pesticide may pose less risk when compared to other registered pesticides with the same uses.
Appendix 2: Organization Charts

Plant Health Unit
Plant and Animal Health Branch

Linkage to the Ministry of Agriculture