

B.C. Plant Health Strategy

2006-2011

for the

***Plant Health Unit
Food Safety and Quality Branch
B.C. Ministry of Agriculture and Lands***

Healthy Farmland / Healthy Crops / Healthy People



**BRITISH
COLUMBIA**

The Best Place on Earth

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Executive Summary

Agriculture crops require protection from pests such as insects, fungi, bacteria, viruses and invasive plants that cause direct or indirect injury to plants. A strategic science-based approach is needed to prioritize and address the plant health risks and issues that affect productivity, environmental sustainability and competitiveness of agricultural crops in British Columbia (B.C.). This document outlines a five-year **Plant Health Strategy** developed by and for the Plant Health Unit, Food Safety and Quality Branch of the British Columbia Ministry of Agriculture and Lands (BCMAL). The process involved feedback from key stakeholders, including industry and government organizations. Forest health, the responsibility of the Ministry of Forests and Range, is addressed in the *Forest Health Strategy*. As appropriate, both ministries work together to address common interests.

Established and potential invasive plants and plant pests directly affect the competitiveness of agricultural 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.

Plant health management contributes to the protection of human health and the environment by promoting best management practices that include the application of Integrated Pest Management principles and the reduction of risks from invasive species on agriculture and biodiversity.

The **Vision** of the Plant Health Unit is *safe, high quality B.C. agricultural commodities produced using economically viable, environmentally sustainable and socially responsible pest management practices.*

The **Mission** of the Plant Health Unit is *to work with our industry and government partners to safeguard the capacity of our agricultural land resource from the adverse impacts of invasive plants and 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.*

The Plant Health Strategy identifies six key goals, 15 key objectives and 40 targeted actions that, undertaken collaboratively, will enable the Plant Health Unit to achieve its Vision and Mission. The goals are based on the principles of Integrated Pest Management, the Ministry's legislative mandate related to plant health, and the values of the Plant Health Unit.

The Plant Health Unit collaborates with partners (government, industry, communities, etc.) to address challenges facing plant health in B.C. These challenges include threats from invasive alien species, impacts from established pests, access to research and extension resources, access to reduced risk pest management tools and changing social values with respect to how food is produced, processed and marketed.

- The strategy supports four of the B.C. Government's *Five Great Goals for a Golden Decade*:
 - Goal 1: Make British Columbia the best educated, most literate jurisdiction on the continent
 - Goal 2: Lead the way in North America in healthy living and physical fitness
 - Goal 4: Lead the world in sustainable environmental management, with the best air and water quality and the best fisheries management, bar none
 - Goal 5: Create more jobs per capita than anywhere else in Canada
- The strategy contributes to the healthy eating and physical activity components of ActNow B.C.
- The strategy supports two key goals of the Ministry's service plan:
 - Goal 1: Competitive, world class agriculture and food sectors
 - Goal 2: Agriculture and food systems that are environmentally sustainable and promote human, plant and animal health

Plant Health Unit Strategic Plan Summary

Ministry Goals and Objectives

<p>Agriculture and food systems that are environmentally sustainable and promote human, plant and animal health</p> <ol style="list-style-type: none"> 1. Effective management of environmental risks 2. Effective management of plant, animal and food safety risks 	<p>Competitive, world class agriculture and food sectors</p> <ol style="list-style-type: none"> 1. Strengthened innovation within the agriculture and food sectors 2. Enhanced international reputation for the quality of B.C. products and improved market access
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Plant Health Unit Goals

<p>Cooperation / Communication / Capacity: Effective, innovative approaches that address plant health issues in B.C.</p>	<p>Risk Analysis: Documentation and prioritization of pests that threaten B.C. agriculture</p>	<p>Surveillance: Timely surveillance of new and established pests that pose a significant risk to agriculture in B.C.</p>	<p>Prevention: Effective, practical and innovative measures to minimize the risk of introduction and establishment of invasive pests</p>	<p>Pest Management: Effective, economical and environmentally sustainable best management practices to address plant health issues</p>	<p>Innovative Management and Delivery Systems: Creative plant health policies and programs supported by appropriate legislation</p>
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Key Plant Health Unit Outcomes

<ul style="list-style-type: none"> • Effective working relationships with partners • Plant Health Unit staff have the required skills and knowledge necessary for protection of plant health in B.C. • Stakeholders aware of and support resolution of top five annual pest management issues in B.C. • Smooth transition of new, qualified staff with minimal disruption of services • Annual B.C. Plant Health Report 	<ul style="list-style-type: none"> • Annually updated lists of priority pests that threaten B.C. agriculture • Current priority pest risk assessments • Biannually updated Crop Profiles and Gap Analyses 	<ul style="list-style-type: none"> • Accurate and timely diagnosis of plant pest problems • Current data on the distribution of new and existing pests in B.C. • Timely distribution of information on new pest threats • Complete, science-based information for decision making • Comprehensive herbarium with wide representation of different B.C. species • Annual pest diagnostic and surveillance reports • A laboratory database system that meets client and BCMAL needs 	<ul style="list-style-type: none"> • Federal regulations restricting or prohibiting the introduction of invasive plants • Canadian Food Inspection Agency (CFIA) Pest Risk Assessments address B.C.'s unique pests and climate • Pest awareness programs • Effective early detection and rapid response programs 	<ul style="list-style-type: none"> • Current, understandable information on pest/pesticide management technology • Priority pest management research needs addressed • Access to more reduced-risk and biological control products for key pests • Pesticide registrants and researchers aware of B.C. needs • Prototype for sprayer calibration program 	<ul style="list-style-type: none"> • Priority pest threats are addressed • Local governments enact supportive bylaws and programs • Effective community-based weed committees throughout B.C. • Legislation, policies and programs of other agencies complement B.C. needs and initiatives
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Introduction

Agriculture crops require protection from pests such as insects, fungi, bacteria, viruses and invasive plants that cause direct or indirect injury to plants. An innovative strategic science-based approach is needed to prioritize and address the plant health risks and issues that affect productivity, environmental sustainability and competitiveness of agricultural crops in British Columbia (B.C.).

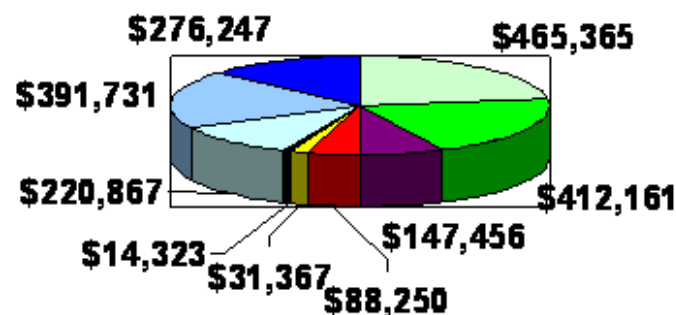
This document outlines a five year **Plant Health Strategy** developed by the Plant Health Unit, Food Safety and Quality Branch of the British Columbia Ministry of Agriculture and Lands (BCMAL). The process involved feedback from key stakeholders, including industry and government organizations. Forest health, the responsibility of the Ministry of Forests and Range, is addressed in the *Forest Health Strategy*. As appropriate, both ministries work together to address common interests.

Farmers in B.C. produce over \$1.2 billion in crops annually, contributing to our economy and providing a source of locally grown, healthy food. A growing industry, crop receipts are 25% above past five-year averages. Leading agriculture industries in B.C. include nursery and floriculture, followed closely by vegetables (greenhouse and field). Crop production is a competitive, global industry and B.C. growers must compete against growers in other countries with lower labour inputs, lower land costs, different environmental standards, warmer climates and better access to effective pest control products.

B.C.'s relatively small agricultural land base is protected from urban encroachment by the Agricultural Land Reserve, and likewise it is important to protect the capacity of the land resource from the deleterious impacts of invasive species that can colonize soils and habitats in perpetuity. High land values in combination with B.C.'s unique climate have resulted in an agriculture industry based upon diverse, high value commodities, with the highest average crop receipts per hectare in Canada. As a result of our climate, B.C. has crops that are unique in Canada and pest threats that may be unique within Canada.

Pest infestations affect the competitiveness of agricultural industries by direct yield losses, pest management costs and reduced quality. Invasive alien pests pose new threats and negative impacts including the disruption of existing pest management programs, reduced environmental sustainability/biodiversity and the potential for lost export markets due to quarantine restrictions.

Commodity Values Farm Cash Receipts, B.C. 2004 (\$'000) Approximate total: \$2.4 Billion



Source = Statistics Canada May 2005

Our Diversity

A single B.C. nursery produces:

- 151 different genera
- 688 different species and cultivars
- 2,579 different products

Achieving healthy crops and promoting healthy farmland requires an innovative approach that safeguards the environment and human health through pesticide risk reduction, and addresses the impacts of invasive alien species on agriculture and biodiversity. Stakeholder feedback emphasized the need for ministry staff to maintain scientific expertise to achieve this approach.

The Plant Health Unit actively promotes **Integrated Pest Management (IPM)**, a systematic decision making process that supports a balanced approach to managing production systems for the effective, economical and environmentally sustainable suppression of pests. Many B.C. growers have adopted IPM as a result of BCMAL encouragement, which provides both economic and environmental benefits. IPM reduces the reliance on pesticides by promoting the use of non-chemical control practices alone or in combination with pesticides. For example, The Okanagan-Kootenay Sterile Insect Release Program for control of codling moth has contributed to an 80% reduction in organophosphate insecticides used on apples and pears in the South Okanagan. IPM also works well with integrated production systems and certification programs, such as the B.C. Fruit Growers' Association Good Agricultural Practices (BCGAP) program.

Important steps to address the negative impacts of invasive alien species are:

- 1) Developing strong networks with other agencies, such as the Canadian Food Inspection Agency (CFIA)
- 2) Involvement on related committee and councils such as the National Invasive Alien Species Terrestrial Plants and Plant Pests Working Group
- 3) Maintaining a strong connection to industry
- 4) Defining priority pest issues

Building upon the opportunities outlined in this strategy; the **Plant Health Strategy** identifies six goals, supported by *15 key objectives and 41 targeted actions*. The goals are based on the principles of Integrated Pest Management, the Ministry's legislative mandate related to plant health, and the values of the Plant Health Unit (pg. 8). The following pages describe each goal, outline the key objectives and list actions the Plant Health Unit will implement to attain the goals and objectives. Outcomes and critical success factors are also specified under each goal.

Implementation of the strategy will require strong leadership, scientific expertise, access to resources, and good relationships that identify and build on common objectives between and within government agencies and industry.

GLOBAL THREATS:

Worldwide there are

- 10,000 insects,
- 30,000 weeds,
- 100,000 diseases and
- 1,000 nematode species

that damage food plants, causing

- \$500 billion in yield losses worldwide, or
- 42.1% of attainable yield is lost.

(Integrated Pest Management, Koul et. al, 2004)



Codling moth larva in fruit

Codling moth is a non-native pest which was introduced to B.C. around 1900. It spread from Victoria to the Lower Mainland and then into the Interior. The Provincial Government has collaborated with fruit growers on management programs since the 1920's, including regulatory control, research and extension, and currently supports the Sterile Insect Release Program.

B.C. Ministry of Agriculture and Lands' 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 Food Safety and Quality Branch, consists of 11 full time positions in the disciplines of plant pathology, entomology, weed science and pesticide science.

Staff facilitate the development, implementation, maintenance and evaluation of integrated pest management practices and products to mitigate the impact of plant diseases, insect pests and weeds; monitor for and address pest outbreaks including non-native and invasive species; make policy recommendations on plant health issues; administer the provincial *Plant Protection Act* and *Weed Control Act*, and provide guidance on the management of pesticides.

Biological Control of Invasive Plants: A Successful Tool in B.C.

The introduction of insects to control the invasive plant nodding thistle in early 1970's has resulted in this invasive plant being categorized as "under biological control throughout B.C.", thus requiring no chemical treatment for its control.

Over the 1970's and 1980's, five biological control insects were released against the noxious weed tansy ragwort in cooperation with Ministry of Forests' staff. These insects have significantly impacted the plant population throughout most of its range in South Coastal B.C.

The introduction of numerous biological control agents attacking diffuse knapweed's various stages of growth has resulted in significant reductions in plant density and competitiveness through most of the southern interior region of B.C.



Cinnabar moth larvae defoliating tansy ragwort

Highlights of B.C.'s Plant Protection 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 province with Plant Pathologist
- 1919 - B.C. joins Western Plant Board
- 1942 - Bacterial ring rot regulations approved under *Plant Protection Act* (1936)
- 1950 - B.C. nursery stock regulations. replaced by *Canadian Destructive Insect & Pest Act*
- 1967 - B.C. Department of Agriculture Plant Diagnostic Lab established in Cloverdale
- 1968 - B.C. second province to develop provincial pesticide regulations (B.C. 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 & two commercial insectaries in B.C.
- 1989 - Ministry's contributions to Sterile Insect Release help the program achieve area-wide suppression of codling moth
- 1990 - Pesticide Applicator Course for B.C. Ag Producers published (copyright BCMAL)
- 1992 - B.C. farmers require certification to use toxic pesticides
- 1995 - First B.C. Minor Use Commodity Committee
- 2002 - B.C. 1st province to develop crop profiles
- 2005 - Invasive Plant Council of B.C. formed

Regulations / Legislation

The BCMAL Plant Health Unit is responsible for administering two provincial *Acts* and their regulations: the *Plant Protection Act* and the *Weed Control Act*.

The ***Plant Protection Act*** provides for the prevention of the spread of pests and diseases destructive to plants in British Columbia, including the powers of inspectors and the authority to establish quarantine areas. At present there are nine regulations listed under the *Act*.

The ***Weed Control Act*** is enabling legislation which provides local governments with the authority to order land occupiers to control noxious weeds on their property. The *Act* also provides for appointment of inspectors to ensure compliance. The weed control regulation currently designates 21 plant species as noxious weeds throughout the province and an additional 27 as noxious within specific regional districts.

Other Legislation:

There are many other provincial, federal, municipal and international regulations that influence the unit's programs and the crop protection practices of agricultural industries in British Columbia. The Plant Health Unit is often requested to comment on legislation or proposed legislation and its impacts on B.C. agriculture.

Provincially Regulated Disease



Bacterial Ring Rot of potato (*Clavibacter michiganense* subsp. *sepedonicus*)

Provincial Noxious Weed



Leafy spurge (*Euphorbia esula*)

Key Legislation Affecting Plant Health in British Columbia

Municipal/Regional

- Various 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
- Grape virus diseases

Vision and Mission

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 invasive plants and 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.

Goals

1. **Cooperation/Communication/Capacity:**
Effective, innovative approaches that address plant health issues in B.C.
2. **Risk Analysis:**
Documentation and prioritization of pests that threaten B.C. agriculture
3. **Surveillance:**
Timely surveillance of new and established pests that pose a significant risk to agriculture in B.C.
4. **Prevention:**
Effective, practical and innovative measures to minimize the risk of introduction and establishment of invasive pests
5. **Pest Management:**
Effective, economical and environmentally sustainable best management practices to address plant health issues
6. **Innovative Management and Delivery Systems:**
Creative plant health policies and programs supported by appropriate legislation



Identification of 220 different insects and diseases by the Ministry's Plant Diagnostic Laboratory's in 2005 helped the B.C. agriculture industry manage their pest threats



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

Values

The Plant Health Unit staff will:

- Work with integrity and competency
- Build trusting, cooperative and open partnerships
- Collaborate with partners to seek innovative solutions to plant health issues
- Communicate proactively with internal and external clients to ensure information sharing and timely responses to plant health issues
- Communicate in a courteous, open, transparent, honest and understandable way
- Recommend policies, programs and legislation that promote sustainable agriculture, social responsibility and economic values
- Strive for a high level of expertise, accountability, effective facilitation, accessibility, flexibility, and good leadership and management principles
- Encourage the wise use of public resources



Forging strategic partnerships to increase access to reduced-risk pesticide products through the federal Minor Use Pesticide Registration process

Strategic Partnership in Action

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.

Linkage to the Provincial Government's Five Great Goals

The goals and activities of the Plant Health Unit support four of the B.C. Government's *Five Great Goals for a Golden Decade*, particularly Goal 4 which focuses on sustainable environmental management:

Goal 1: Make British Columbia the best educated, most literate jurisdiction on the continent

Goal 2: Lead the way in North America in healthy living and physical fitness

Goal 4: Lead the world in sustainable environmental management, with the best air and water quality and the best fisheries management, bar none

Goal 5: Create more jobs per capita than anywhere else in Canada

Linkage to ActNow B.C.

The goals and activities of the Plant Health Unit contribute to the healthy eating and physical activity components of ActNow B.C. by: facilitating access for British Columbians to fruits and vegetables which contribute to improved health and quality of life and; facilitating the prevention and management of pest species that impact recreational areas available for British Columbians to partake in physical activities.

Linkage to the Ministry of Agriculture and Lands' Service Plan

The goals and activities of the Plant Health Unit support the two core Ministry business areas: **"Agriculture and Aquaculture Management and Food Industry Development"**.

The Plant Health Unit predominantly works to implement the Ministry's Service Plan goal: **"Agriculture and food systems that are environmentally sustainable and promote human, plant and animal health"**.

The Plant Health Unit takes a lead role implementing the plant component of the objective: **"Effective management of plant, animal and food safety risks"** particularly as it relates to the early identification and response to plant pests including invasive plants. The Plant Health Unit also works closely with other branches to implement the objective: **"Effective management of environmental risks"**.

A second Ministry Service Plan goal: **"Competitive, world class agriculture and food sectors"** is achieved through partnerships with other branches. Providing access to pest management knowledge, tools and innovative technology enables the B.C. agriculture industry to produce competitive and profitable crops using environmentally sustainable practices.

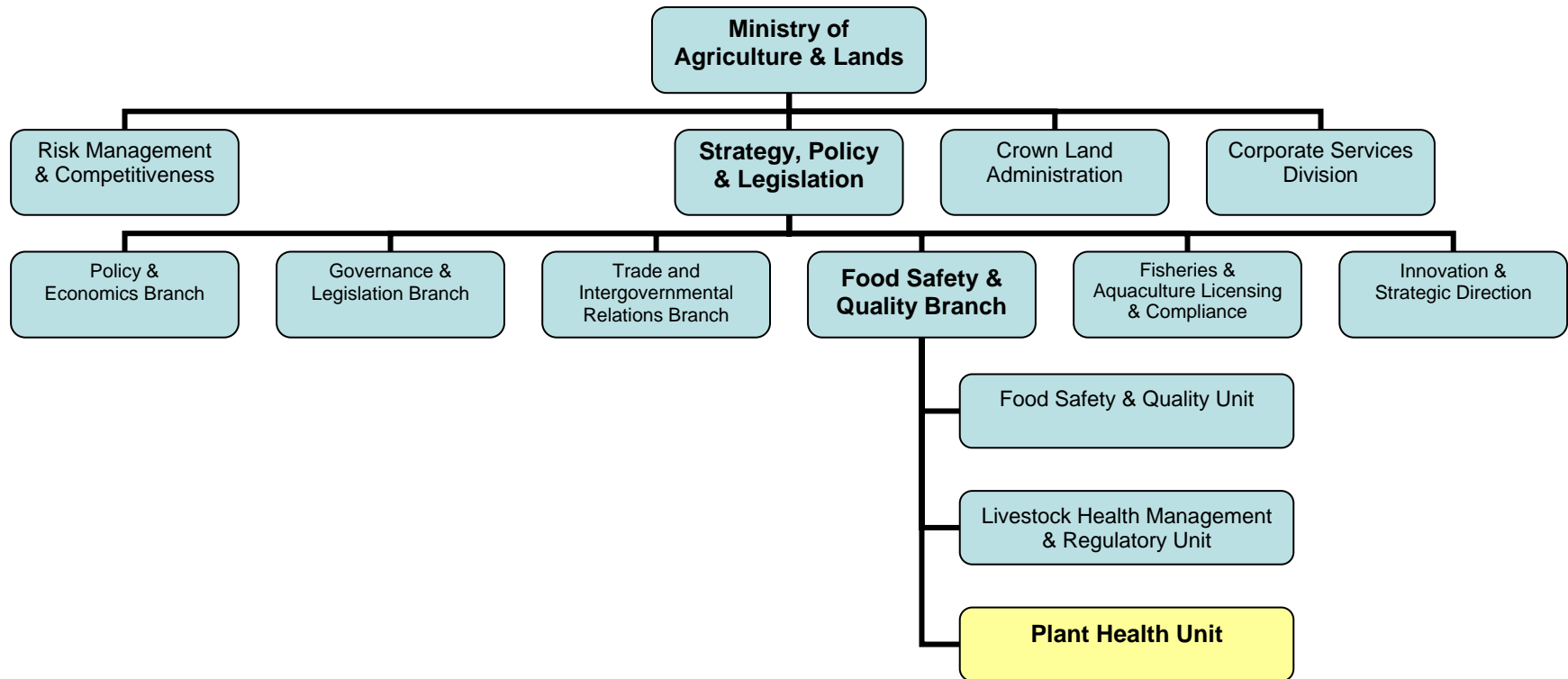
Key Activities supporting the Five Great Goals

- Promoting the use of best practices for pest and pesticide management through education/extension activities and industry communications
- Supporting local production of healthy foods using environmentally sustainable practices
- Mitigating negative impacts associated with the spread of invasive plants, insects and diseases
- Contributing to the strength of the agricultural sector by protecting crop health

Key Activities supporting Ministry Goals:

- Preventing and managing invasive species that threaten quality, productivity and biodiversity
- Protecting market access from the impacts of invasive species
- Providing timely and accurate diagnostic services for plant diseases, insects and plants
- Finding solutions through emergency 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* and the *Weed Control Act*
- Supporting Environmental Farm Planning
- Providing advice and information on the safe and proper use of pesticides to minimize risks to worker health, food safety and quality, and the environment

Linkage to the Ministry of Agriculture and Lands



Plant Health Challenges and Opportunities

Challenges to plant health are numerous and complex. These include both direct threats to crops and markets, as well as the challenges to mitigate the 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 the pests. In addition, a strong science-based foundation is essential for effective decision making combined with creative thinking that facilitates the development and implementation of fiscally responsible innovative delivery systems.

- **Threats from Invasive Alien Species**

Globalization is increasing the threat from new invasive species. Defining priority pest issues, and taking steps to mitigate the risks, strengthen our ability to protect B.C.'s environment and the competitiveness of our agriculture industry.

- **Access to Research and Extension**

Capacity to address B.C. issues has declined as outlined in the adjacent table. 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. Well informed growers with access to new, applicable research have the capacity to be more competitive.

- **Changing Social Values**

Public demand for safer food, public concern about pesticides, an increased focus on the environment, and urban/rural conflicts influence the pest management practices B.C. agriculture can use. Increased public interest and awareness provides an opportunity to enlist public in pest surveillance, seek new solutions such as niche markets, encourage the agricultural community to adopt environmentally sustainable pest management practices and promote B.C. produce as a healthy food choice.

- **Access to Pest Control Tools**

B.C. producers need access to safe and effective tools to manage pests. Improving access to effective, reduced-risk pesticides, biocontrol products and other pest management tools will help B.C. growers compete in domestic and global markets, effectively manage pests and implement pesticide resistance management.

- **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.

Examples of Invasive Impacts

- B.C. nursery growers lost over \$2.3 million from *Phytophthora ramorum* (2003-2005)
- B.C.'s annual crop losses due to invasive plants exceeds \$50 million
- Eradicating invasive pests can be very costly. For example, Federal expenditures on eradication of Plum Pox Virus in Ontario are approaching \$100 million (2006).

Access to Scientific Resources

Applied Research Scientists at B.C. Universities & Agriculture and Agri-Food Canada Research Stations	1990	2005
Disease	10	4
Insect	13	9
Nematodes	2	0
Weeds	3	1
TOTAL	28	14

Consumer Concerns With Pesticides

A 2005 CropLife poll found 81% of consumers are concerned about pesticides being used to grow food; 77% believe agricultural chemicals are harmful to health. Eighty percent of fresh food tested was residue free; 0.7% of fresh domestic and 0.5% of fresh imports had pesticide residues above Health Canada guidelines. The rest were below the guidelines.

- **Capacity for Rapid Response**

Not addressing new invasive species before they become established may cause negative impacts to B.C.'s agriculture and ecosystems. Improved coordination and rapid response prevents crop losses and maintains current markets.

- **Compensation**

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

- **Climate Change**

Climate change is expected to increase the risk of establishment and spread of plant pests.

Strategic Partnerships

The responsibility for many plant health issues is shared among different jurisdictions. Strong working relationships within the ministry and with industry associations, government agencies, researchers, regulators and other stakeholders are crucial for timely decisions, rapid response and use of resources. Previous crises such as Avian Influenza demonstrated the importance of good cooperation, experience handling crises, and the need for clear understanding of partners' roles and responsibilities. The Plant Health Unit is committed to advancing existing relationships and exploring opportunities to establish new partnerships.

Key Committees:

- Invasive Alien Species Coordinating Committee (B.C.)
- Inter-Ministry Invasive Plant Committee
- Invasive Plant Council of B.C.
- B.C. Plant Protection Advisory Council
- Canadian Plant Protection Advisory Committee
- Western Plant Board
- Expert Committee on Integrated Pest Management
- Federal-Provincial-Territorial Committee on Pest Management and Pesticides
- B.C. Integrated Pest Management Committee
- Minor Use Pesticide Working Group
- Minor Use Commodity Committees

Partners Include:

- Other branches within BCMAL
- Other B.C. Government Ministries
- Other Provincial Governments
- Municipal Governments
- B.C. Centre for Disease Control
- Community-based weed committees
- Environment Canada
- Pest Management Regulatory Agency
- Agriculture and Agri-Food Canada
- Canadian Food Inspection Agency
- Canadian Forest Service
- B.C. Agriculture Council
- B.C. livestock & grower associations
- Canadian Horticulture Council
- Canadian Federation of Agriculture
- Agriculture in the Classroom Foundation
- Farm & Ranch Safety & Health Association
- Private researchers
- Pest managers
- Environmental Farm Planners
- CropLife Canada
- Urban Pest Management Council of Canada
- US IR-4 Program
- Education institutes in B.C.
- Biocontrol Network
- First Nations
- Agribusiness
- Utility companies
- Forest companies
- Environmental associations
- Master Gardeners

GOAL 1. COOPERATION/COMMUNICATION/CAPACITY: Effective, innovative approaches that address plant health issues in B.C.

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

Key Objectives

- **Enhance and expand linkages with government and non-government stakeholders, including educational institutions, to address B.C.'s plant health needs**
- **Maintain scientific and professional competence of staff**
- **Communicate needs, accomplishments and issues**

Critical Success Factors

- Professional development opportunities for staff and participation in scientific/professional organizations
- Extensive networks with key agencies
- Cooperative partners that provide timely information on new issues
- Succession planning, youth employment program, coop student program, adequate staffing resources
- University and college program to train sufficient new plant health professionals
- Ability to attract highly qualified people to seek employment within the Plant Health Unit



Professional Development

Specialist staff attends technical and scientific conferences and workshops to update their skills and knowledge. New knowledge is shared with clients in an interactive process that enables specialists to receive feedback on issues and effectiveness of new pest management technologies.

Key Actions

- Participate in regional, provincial and national forums that influence plant health programs
- Maintain strong connections with industry associations
- Strengthen and expand partnerships with agencies to ensure research, monitoring and related programs are practical, coordinated, and meet B.C. agriculture needs
- Clearly define agency roles and responsibilities
- Update staff skills and knowledge through participation in scientific organizations, technical conferences and workshops
- Encourage the training of more plant health professionals
- Develop and implement a succession planning strategy for the Plant Health Unit
- Complete an annual Plant Health Report
- Identify and establish new partnerships with educational institutes with capacity for leading edge research

Outcomes

- Effective working relationships with partners
- Plant Health Unit staff have the required skills and knowledge necessary for protection of plant health in B.C.
- Stakeholders aware of and support resolution of top five annual pest management issues in B.C.
- Smooth transition of new, qualified staff with minimal disruption of services
- Annual B.C. Plant Health Report

GOAL 2. RISK ANALYSIS:

Documentation and prioritization of pests that threaten B.C. agriculture

Pest risk analyses assess the probability of a pest becoming introduced and established in B.C.; evaluate the potential impact of the pest on agriculture and the environment; identify risk management measures; communicate risks; and provide a foundation for developing new or altering existing plant protection policies and programs.

Key Objectives

- **Be knowledgeable about potential and established pests that threaten B.C. agriculture**
- **Determine B.C.'s top agricultural pest priorities**

Critical Success Factors

- Ability to complete and maintain Crop Profiles and risk assessments
- Access to current information, including CFIA risk assessments and pest distribution maps
- Participation in regional, provincial, national and international forums on alien invasive species
- Effective communication and cooperation with industry and other government agencies



The Apple Maggot - Priority Invasive Pest

The Apple Maggot (*Rhagoletis pomonella*), recently found for the first time in B.C. in the Fraser Valley, is a serious threat to apple crops. Public awareness programs are a priority of the Plant Health Unit to prevent its spread to other parts of B.C. If established, growers would need to increase insecticide sprays to protect fruit. This would reverse the trend of reduced pesticide use achieved by the codling moth sterile insect release program.

Key Actions

- Conduct pest risk analyses
- Complete and maintain up to date crop profiles, good agricultural practices analyses, and priority pest lists for B.C. crops
- Consult with the CFIA on their Pest Risk Assessment guidelines for pests that threaten B.C. agriculture
- Facilitate the ability of industry associations to prioritize plant health needs
- Establish and implement a system to determine B.C.'s top ten potential and top ten established pest priorities
- Develop and maintain a list of key pests including the top ten potential and top ten established species threatening B.C. agriculture

Outcomes

- Annually updated lists of priority pests that threaten B.C. agriculture
- Current priority pest risk assessments
- Biannually updated Crop Profiles and Gap Analyses

GOAL 3. SURVEILLANCE:

Timely surveillance of new and established pests that pose a significant risk to agriculture in B.C.

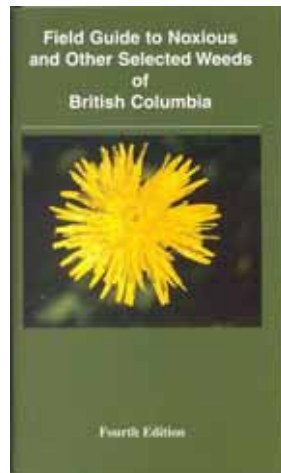
Preventing establishment of new pests and tracking changes in established pest populations in B.C. requires: timely surveillance programs that engage all stakeholders including the public, support from trained staff, a well equipped diagnostic laboratory and collaborative extension programs.

Key Objectives

- Facilitate development and implementation of a coordinated surveillance network for early detection of invasive plants and plant pests
- Continually enhance pest diagnostic capacity in B.C.
- Understand the distribution of key pests in B.C.

Critical Success Factors

- Cooperation, coordination, communication and liaison with key partners
- Timely reporting and communications
- Availability of resources and training for staff



Early Detection and Surveillance of Invasive Alien Species

- The *Field Guide to Noxious and other Selected Weeds of British Columbia* provides information to growers and the public on detecting invasive plants that threaten B.C.
- In 2004, Canada's first plant recall occurred in B.C. for camellia plants exposed to *Phytophthora ramorum* (sudden oak death). A motivated public produced over 980 calls to the hotline, identifying over 1364 camellia plants for pick up, sampling and destruction.

In 2005, the Ministry's Plant Diagnostic Laboratory's identification of 220 different species of insects and diseases helped the B.C. agriculture industry manage their pest threats.

Key Actions

- Develop more information to aid recognition of invasive pests
- Enhance diagnostic capabilities
- Collaborate with other agencies on pest diagnostics, surveillance and mapping
- Provide accurate, timely diagnosis of plant health problems
- Update and expand the pest database and reference collections
- Engage the public in pest surveillance

Outcomes

- Accurate and timely diagnosis of plant pest problems
- Current data on the distribution of new and existing pests in B.C.
- Timely distribution of information on new pest threats
- Complete, science-based information for decision making
- Comprehensive herbarium with wide representation of different B.C. species
- Annual pest diagnostic and surveillance reports
- A laboratory database system that meets client and BCMAL needs

GOAL 4. PREVENTION:

Effective, practical and innovative measures to minimize the risk of introduction and establishment of invasive pests


Keeping invasive species out of B.C. is a challenge. However, the use and promotion of preventative practices will minimize the risk that new pests become established to threaten agricultural crops, biodiversity and access to export markets.

Key Objectives

- **Cooperate in the development and implementation of regulations and innovative programs to prevent the introduction of new invasive species**
- **Improve infrastructure and process to enable rapid response to prevent the establishment and spread of newly introduced invasive species**

Critical Success Factors

- Effective executive level partnerships with federal agencies
- Access to networks and resources to collect and compile critical information
- Access to relevant literature and technical expertise
- Staff linkages with the Invasive Plant Council Early Detection Rapid Response sub-committee and the B.C. Plant Protection Advisory Committee



Prevention of Invasive Alien Species

Increasing public awareness and understanding of the threats posed by invasive species is key to reduce the risk of the introduction and establishment of new pests.

Key Actions

- Encourage development of federal regulations to prevent the introduction or spread of invasive plants
- Collaborate with the Canadian Food Inspection Agency on timely identification and management of pests impacting B.C.
- Formalize Ministry's protocol for responding to new pest detections
- Facilitate the implementation of detection and rapid response programs to prevent the establishment and spread of invasive species
- Maintain a list of pest management options for high priority invasive species
- Engage public participation to prevent the introduction of pests

Outcomes

- Federal regulations restricting or prohibiting the introduction of invasive plants
- Canadian Food Inspection Agency Pest Risk Assessments address B.C.'s unique pests and climate
- Pest awareness programs
- Effective early detection and rapid response programs

GOAL 5. PEST MANAGEMENT:

Effective, economical and environmentally sustainable best management practices to address plant health issues

Protecting crops and livestock from current and recently introduced pests using best management practices places less burden on the environment, reduces risk to human and food safety, and enhances food quality, productivity and marketing opportunities.

Key Objectives

- **Facilitate access to pest management tools including biological control agents, pesticides, pheromones and cultural practices**
- **Facilitate the development and adoption of pest management practices that protect the environment and enhance the sustainability of B.C. agriculture**
- **Enhance the availability and applicability of Integrated Pest Management programs for B.C. agriculture**

Critical Success Factors

- Capacity and structure to provide information to B.C.'s 15,000 farms that produce crops
- Cooperation and commitment of partners (i.e. government. agencies, commodity associations)
- Access to relevant literature and technical expertise
- Access to discretionary funding programs



Commodity Best Management Practices Guides

Commodity guides are important sources of information for B.C. producers. The Plant Health Unit prepares up to date, balanced content on best management practices to protect crops and manage pests. These guides are key communication tools for promoting practices that are effective, practical and environmentally sustainable. The guides form part of the Environmental Farm Plan Program series of Beneficial Management Practices.

Key Actions

- Develop and provide relevant pest/pesticide management information, products and programs
- Develop and implement strategies to provide industry with access to current pest management information
- Facilitate the development of local data and modification of IPM programs for B.C. agriculture
- Encourage research on better, reduced-risk tools and technologies to address key B.C. issues
- Coordinate, prepare and submit minor use and emergency registration requests
- Encourage companies to register new pest control tools, including biological control products, in Canada
- Maintain and enhance the Food Safety and Quality branch web site
- Link industry with researchers, funding sources and pest management advisory services

Outcomes

- Current, understandable information on pest/pesticide management technology
- Priority pest management research needs addressed
- Access to more reduced-risk and biological control products for key pests
- Pesticide registrants and researchers aware of B.C. needs
- Prototype for sprayer calibration program

GOAL 6. INNOVATIVE MANAGEMENT AND DELIVERY SYSTEMS

Creative plant health policies and programs supported by appropriate legislation

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

Key Objectives

- **Strengthen B.C.'s ability to manage plant health issues through development and implementation of innovative solutions and approaches**
- **Influence federal, provincial and local policies, programs and legislation that address B.C.'s plant health issues**

Critical Success Factors

- Adequate funding to operate weed committees throughout B.C.
- Effective cooperation with partners



The European gypsy moth, *Lymantria dispar*, is a serious invader from eastern North America that threatens many of our plants, crops and forests. It is regulated under the provincial *Plant Protection Act*. In cooperation with the Ministries of Forests and Range, and Environment, BCMAL participates in eradication measures when they are required to prevent establishment.

Key Actions

- Develop strategic approaches to manage specific plant health issues
- Participate on multi-agency advisory committees
- Provide guidance and support for development and operation of local weed committees
- Review and respond to federal, provincial and local policy, program and legislative proposals on pest/pesticide management
- Encourage policy, program and legislative changes that improve access to new, environmentally sustainable control technologies
- Develop and implement a five year work plan identifying management targets and outcomes

Outcomes

- Priority pest threats are addressed
- Local governments enact supportive bylaws and programs
- Effective community-based weed committees throughout B.C.
- Legislation, policies and programs of other agencies complement B.C. needs and initiatives

Implementation - The Way Forward

Government has a legitimate role to protect the economy, the environment and the capacity of our land resource from the negative impacts of invasive plants and plant pests that may establish here. Since 1888, the Province of B.C. has worked to protect these public needs through legislation, surveillance, targeted funding and education/awareness.

The Plant Health Strategy builds on this foundation and lays out the framework to prevent new infestations and manage existing ones in environmentally sustainable ways. It is important to act now as recent globalization has increased the threat from invasive plants and plant pests.

The Plant Health Unit's five year work plan addresses the strategy's six goals. Staff Employee Performance and Development Plans will directly link to the work plan. Key to successful implementation will be effective partnering with multiple stakeholders and creative thinking to develop fiscally responsible innovative solutions and delivery systems.

The strategy commits the Plant Health Unit to:

- Build on the strengths of existing partnerships to align resources and legislation for the purpose of effectively preventing, detecting, eradicating and/or managing invasive plants/plant pests
- Explore and establish new partnerships
- Participate on local initiatives (i.e. local weed committees); provincial initiatives (i.e. B.C. Plant Protection Advisory Council, B.C. Integrated Pest Management Committee); national initiatives (i.e. Terrestrial Plant and Plant Pest Working Group); and international initiatives (i.e. Western Plant Board)
- Improve capacity by building on existing resources through training and awareness, eliciting volunteer assistance and training of sufficient new plant health professionals
- Encourage private and public research agencies to increase research support for B.C. plant health priorities

- Facilitate the development and promote the adoption by industry of environmentally sustainable pest management technologies
- Facilitate capacity for accurate diagnostics of new invasive plants and plant pests
- Implement science-based prioritization of invasive plants, insects and pathogens for planning and decision making that uses the best available information
- Encourage improved pesticide regulatory programs, policies and legislation that increase access to reduced risk pest management tools
- Regularly report on plant health issues, actions and outcomes

Success will be defined by:

- Up to date pest risk analyses and prioritization of and proposed management plans for invasive plants and plant pests that threaten B.C.
- Creation and maintenance of a surveillance network to detect new invasive plants/plant pests that threaten B.C. agriculture
- Timely and accurate diagnosis of established and suspected invasive plants and plant pests to facilitate rapid response measures
- Increased availability of reduced risk pest management tools to manage established species
- Timely production and distribution of information on new invasive species, best management practices and reduced risk products
- Initiate development of effective pest management programs for priority invasive plants and plant pests within one to two years of detection of new pests
- Establishment of community-based weed committee/invasive species societies in all regions of B.C.
- Improved capacity to enforce the *Weed Control Act*
- Address priority pest threats through effective provincial legislation

Critical Success Factors:

- Successful collaboration with external partnerships
- Long term and adequate funding support
- Access to sound science that focuses on specific and sometimes regional needs
- Greater access to reduced risk pesticides and biological control
- Capacity to recruit trained plant health specialists
- Inclusion of plant health considerations in the Agriculture Plan (B.C.) and future Agriculture Policy Frameworks or other federal/provincial agreements

This strategy provides the framework to achieve our vision of:

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

Implementation of this Plant Health Strategy will contribute to:

Healthy Farmland / Healthy Crops / Healthy People and a better quality of life for all British Columbians

For More Information:

Contact: Food Safety and Quality Branch
Plant Health Unit
B.C. Ministry of Agriculture and Lands
1767 Angus Campbell Road
Abbotsford, B.C. V3G 2M3

Phone: 604 556-3001 or toll free at 1 888 221-7141

Web: www.al.gov.bc.ca/cropprot/index.htm



Collaborating with federal, provincial and territorial partners to seek innovative solutions to plant health issues

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.

Integrated Pest Management

- A systematic decision-making process that supports a balanced approach to managing 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.

Invasive plant

- A plant species that has the potential to pose undesirable or detrimental impacts on humans, animals or ecosystems. Often arriving from other areas, their spread and establishment is not suppressed by the natural forces present in their home environment.

Nematode (plant parasitic)

- Small roundworms that are parasitic on plant roots and/or leaves.

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. Pesticides include products used to manage the growth of plants (plant growth regulators), insecticides, fungicides, herbicides, nematicides, rodenticides, organic products and microbial pesticides.

Pheromones

- Chemicals produced by insects and other animals to communicate with and influence the behavior of other animals of the same species. Most pheromones used in pest management today are synthetic with a non-toxic mode of action towards target organisms such as mating disruption.

Pest

- A plant pest is any biotic factor such as insect, mite, nematode, fungus, bacteria, virus, 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) to prevent the spread of diseases, insects and 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.

Reference: Koul, O., Dhaliwal, G.S., and Cuperus, G.W. (eds.) *Integrated pest management: potential, constraints, and challenges*. 2004. Oxfordshire, UK: CABI Publishing