

# Science and Innovation



## Pacific Agri-Food Research Centre

Summerland, British Columbia

The Pacific Agri-Food Research Centre (PARC) in British Columbia is one of Agriculture and Agri-Food Canada's national network of 19 research centres. The Centre consists of two independent research sites: Agassiz and Summerland. Both locations have Minor Use Pesticide Programs that improve access to new and effective crop protection tools and technologies.

The mission of the PARC Summerland Research Centre is to generate knowledge and technologies to promote sustainable and economically viable production of wholesome foods and novel bioproducts from high-value horticultural crops for local, national and international producers and markets. Summerland is the home of the Canadian Plant Virus Collection which consists of freeze-dried and live viruses maintained in perennial plants.

### Areas of Research

Major research is conducted on understanding the linkages between food, nutrition and health; securing and protecting food production, and balancing the activities of agriculture with the goal of a sustainable environment. The focus is on horticultural crops such as grapes and tree fruits.

### Integrated Systems for Horticulture and Environment

- Leading research on woody perennial crops; developing production systems that enhance producer profitability while sustaining the agro-ecosystem
- Researching on soil-water-nutrient interactions in perennial cropping systems and their impact on drainage and leaching to groundwater
- Developing resource management strategies for water and nutrients in tree fruits and grapes
- Determining the impact on plant health of beneficial and disease-causing fungi and bacteria
- Developing apple and sweet cherry varieties with a longer harvest season, excellent fruit quality, disease and insect resistance, and with the capacity to adapt to the Canadian climate
- Studying the sensitivity of perennial agro-ecosystems to changing environmental conditions including the development of methodology and integrated bio-physical models to determine the effects of these conditions on agricultural ecosystems
- Discovering ways to enhance the quality of tree fruits and specialty crops, and more efficient ways to produce and store them
- Understanding the effects of disease-bearing insects, germs and microbes in fresh fruit and vegetables



- Developing area-wide management techniques for pests and management strategies based on insect chemical ecology and biological control
- Investigating chemical controls, for short term use, in small-scale production crops

### Crop Protection Biotechnology and Genomics

- Leading research in agricultural plant virology; providing new knowledge and tools for mitigating viral plant diseases
- Diagnosing plant viruses to better understand how they replicate so that new diagnostic methods and strategies for disease control can be developed
- Studying the effectiveness of baculoviruses (viruses that kill insects) for possible use as biological pesticides
- Controlling plant virus diseases through the use of natural products
- Conserving plant virus genetic resources in both freeze-dried culture and live viruses in living perennial plants including acquisition, maintenance and distribution (Canadian Plant Virus Collection)

### Food Quality, Safety and Bio-Products

- Sensory profiling of fruit and vegetable products with an emphasis on new cultivar selection for taste, texture, appearance and smell (sensory evaluation)
- Conducting studies to understand critical factors which determine fruit/wine quality including effects of viticulture and terroir; distinguishing new and existing cultivars of grapes and profiling the character of Canadian wines
- Assessing the quality of fruits and vegetables where preservation techniques (such as modified atmosphere packaging) are used to prolong the freshness of the product
- Identifying and using components from Canadian crops and by-products from food industries to develop foods that promote health beyond their basic nutrients (functional food and nutraceuticals); investigating these food ingredients to determine antioxidant and anti-inflammatory properties

- Developing and applying new green technology for separation, extraction, fractionation and bioconversion to obtain various components from agricultural products for conversion and processing into higher-value end products
- Studying the fate of human pathogens in fresh and ready-to-eat fruits and vegetables and developing methods to mitigate their impact
- Determining factors affecting shelf life and quality of fruit and vegetable products destined for fresh consumption

## Facts, Figures and Facilities

- 320 hectare site, with approximately 90 irrigated hectares planted to various tree fruits and wine grapes
- Isolated virus orchard
- Food research, and extraction and fractionation laboratory pilot plant
- Sensory evaluation laboratory
- Microscopy facility with scanning, transmission and confocal capability
- Research scale controlled atmosphere facility
- Small lot winery
- Canadian Plant Virus Collection
- DNA analyzer
- GIS laboratories
- Insect rearing rooms
- Drainage lysimeter
- Ornamental gardens and museum



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