

2021 Research and Innovation Priorities for Greenhouse Vegetables*

The Vision: An innovative and competitive national greenhouse vegetable sector with a strong growth agenda.

The Goal: Development of a “Greenhouse Network of Research Excellence” that:

- brings together a network of highly qualified personnel (HQP) and expertise from across various disciplines in academia, government, and industry,
- works collaboratively on greenhouse vegetable research and innovation priorities to achieve our vision for the sector, and,
- addresses emerging competitiveness issues, while amplifying opportunities for the sector to contribute to climate action, food security and economic recovery in an era of disruption.

Priority Project Areas	Strategic Outcomes	Investment Priority for Research
Energy and Efficiency, Production Outcomes	<p>Transition to alternative energy sources (heat and electricity), greater efficiencies from traditional and alternate fuel sources, lighting under abatement strategies, informed by producer knowledge have resulted in greater energy efficiency and higher quality production.</p> <p>Circular economies, finding ways to reuse our products, and waste (plant and plastic).</p> <p>Initiatives to explore enhanced growing methods have resulted in expanding crops, enhanced yields, lower production costs, higher quality and more consistent products and sustainable production methods that have a positive impact on the environment.</p>	<ul style="list-style-type: none"> • Research to guide the validation and feasibility of various energy sources and technology components for Canadian greenhouse vegetable production systems • Carbon emission reduction • Carbon dioxide direct capture • Net zero production • Alternative fuels, renewable energy options • Latent heat recovery • Water efficiencies • Waste management • Precision agriculture • Lighting regimes, under abatement strategies • Less energy intensive crops • Growing methods (i.e.: year-round production, sap analysis, fertilization, etc.) • Post-harvest management • Breeding (for low light conditions, reduced temperatures, automation, etc.)
Labour	<p>More full-time, year-round employment; reduced need for hand-labour and increased demand for highly skilled workers.</p> <p>Increased automation and mechanization of certain production tasks (e.g., harvesting) Data systems that register input needs, inform inventory and order products have increased need for technology and data systems savvy workers</p> <p>Training programs have attracted upper/middle production management graduates to work in production greenhouses.</p>	<ul style="list-style-type: none"> • Enabling the transition to an automated workplace • Protecting economic viability of farms through transition to automation • Education/training programs related to elements of automation (AI) • Micro-credentialing (i.e., short course certifications, e.g., cybersecurity) • Validation of mechanization for certain production tasks (i.e. solutions in other sectors or countries that could be validated for greenhouse use) • Integrated data systems to increase farm management efficiencies within the value chain • Addressing and Assessing Mental Health across all workplace

<p>Pest Management</p>	<p>Research and innovations in pest management initiatives enable us to detect invasive pests and diseases before they become established, resulting in less pesticide use, a reduced footprint and increasing consumer confidence.</p> <p>We have an improved and more responsive regulatory framework for pesticides, and bio-controls for emerging invasive pests and diseases, relative to trading partners.</p>	<ul style="list-style-type: none"> • System approaches to greenhouse pest issues, integrating technology • Furthering the body of knowledge on Tomato Rugose (ToBRFV) • Identification of domestic beneficial species • RNAi pesticides or other tools (mechanical and cultural) • Furthering the IPM tool kit for greenhouse • Cultural practices to reduce pest and disease pressure • Genomic scouting techniques • Whole greenhouse pest monitoring, genomic specifically
<p>Enabling Strategy</p> <p>Knowledge Translation and Transfer</p>	<p>National collaboration with growers, universities and government researchers has resulted in</p> <ul style="list-style-type: none"> • Coordination of research; • Translation of results; • Transfer of knowledge & technologies for grower use; • High adoption rates by industry. 	<ul style="list-style-type: none"> • Training programs • KT Coordinator • Communications and dissemination strategies (i.e. webinars, magazine, newsletters, etc.) • Tours/Open houses for government policy decision makers