



Case Study

Technology roadmaps to drive opportunities within Canadian horticulture



Market intelligence

Gather industry and market insights on short-, medium- and long-term challenges faced by value chain members (e.g. growers to grocery retail) in Canadian horticulture and promote a sector-wide understanding of issues.



Innovation broker

Connect the horticultural sector with businesses in the agriculture and agri-food space and other industries, such as technology and automation companies, to help define opportunities for developing a wide range of innovative technological solutions.

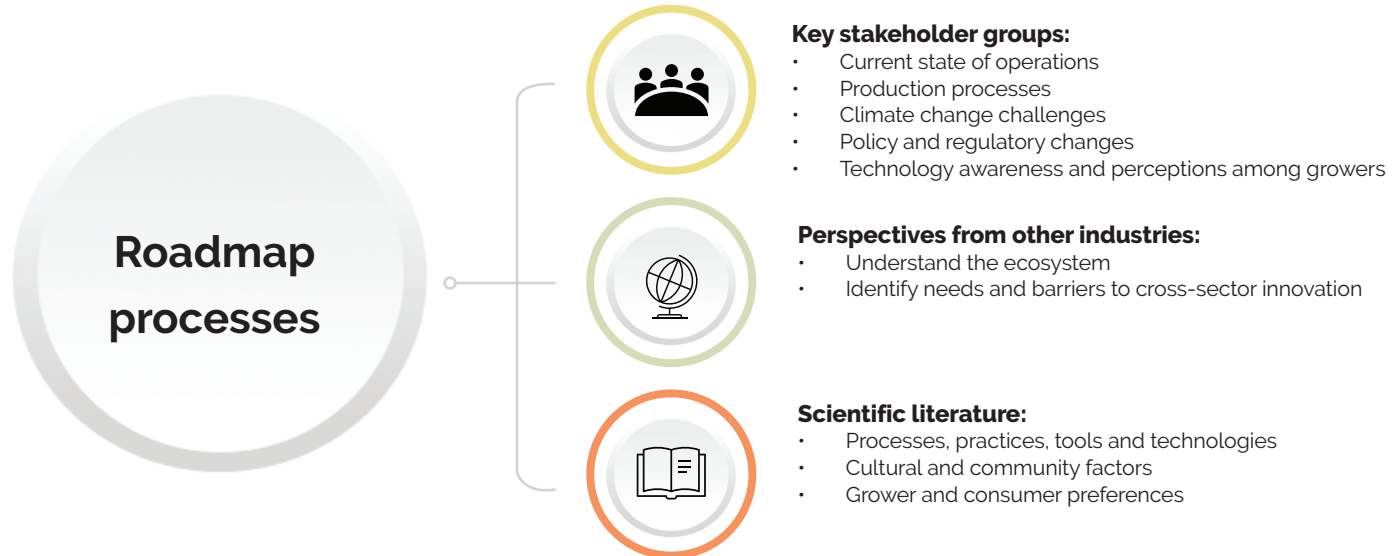


Planning for adoption

Provide technological solutions encompassing sensors, artificial intelligence, substrates, organic fertilizers, biostimulants, new plant varieties, with the goal to enhance sustainability, profitability and competitiveness of the Canadian sector across different regions, communities, businesses and crops.

THE VINELAND APPROACH

Vineland takes a multifaceted approach to ensure a well-rounded comprehension of the subject matter, including:



PROJECT GOALS

Roadmaps offer an opportunity to explore a spectrum of topics. Vineland undertook a number of roadmaps for industry partners including:

- Understanding the economic, sustainability, social and technological needs and challenges faced by different members of the produce value chain (e.g. labour shortages)
- Assessing the impact of environmental changes on the horticultural sector (e.g. climate change, sustainability targets)
- Enhancing technological awareness of produce value chain members, identifying and removing barriers to technology adoption/integration
- Facilitating collaboration and innovation within and across industries, regions, value chain and communities, leading to agri-food automation, market expansion and growth of Canadian horticulture and related sectors
- Clarifying the opportunity for the horticultural sector either through technology adoption or collaboration
- Reviewing the legal and regulatory landscape, as well as associated trends related to the horticultural sector

THE OUTCOME

These outcomes collectively demonstrate the value of conducting comprehensive research projects in the horticultural sector, offering insights into technological advancements, labour challenges, market awareness and the need for sustainable practices and regional adaptation. Such projects provide a roadmap for industry stakeholders to navigate the complex landscape of modern agriculture by examining the application of several technological innovations to address the challenges faced by them over the short, medium and long term.

Technological solutions for grower challenges:

Recognized current and emerging challenges faced by growers and the broader issues in horticulture, incorporating the voice of the growers. Identified potential technological solutions and addressed the innovation gap by assessing the viability of existing or new technologies.

Labour and resource challenges:

Recognized continuous labour challenges in the Canadian agricultural sector and identified resource and investment gaps, helping value chain members understand associated challenges and forecast future resource availability.

Market awareness and collaboration:

Emphasized the importance of market awareness and opportunities for expansion and promoted collaborations and connections between different sectors, benefiting the Canadian agricultural and agri-food industry.

KEY METRICS

5 Technology roadmaps were created including:

1 Region specific

2 Domain/sector specific

2 Crop specific

3 Grower associations

600+ Members growing a variety of 17+ crops

40+ Technological innovations reviewed/discussed/evaluated

THE OUTCOME (Continued)

Technological adoption challenges:

Highlighted challenges of technology adoption, including high equipment costs, resistance to change and user-friendliness concerns. Also identified technology gaps and acknowledged that autonomous, data-driven technologies like IoT have been growing in importance.

Adaptation to regions and climate change:

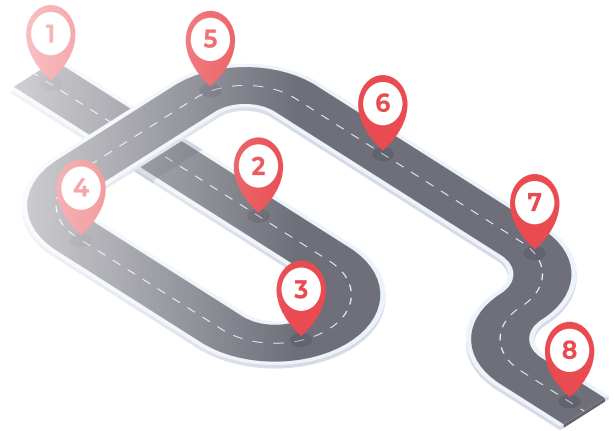
Recognized unique challenges of extreme weather conditions faced by growers in different climate zones, explored strategies for sustainable food production in cold climates, including selection, development and adaptation of crop varieties to growing conditions in Canada and examined the impact of climate change on food production across different regions and climate zones.

Environmental sustainability:

Reviewed factors for environmental impact assessment and explored opportunities to expand crop varieties, reuse energy and develop distribution networks for perishable goods, making food production in Canada more sustainable.

Consumer and community perspectives:

Gathered consumer insights regarding fresh produce preferences, organic certifications and the importance of local produce. Also recognized the interest in traditional diets and community-based food production and consumption.



THE IMPACT

We delivered roadmaps that guided steps toward achieving the triple bottom line of sustainability — environmental, economic and social through:

Strategic technological evaluations:

Roadmaps evaluated current and future technology opportunities, categorizing them based on time, capital investment and commercialization stage. Roadmaps focused on specific sectors, regions and crops, as well as environmental sustainability.

Production cycle optimization:

The technological evaluations were strategically presented in order of their impact on the production cycle, from soil management to postharvest solutions. These ranged from current technologies to potential innovations with short-, medium- and long-term outlooks, and ensured alignment with future needs and developments. This approach allowed clients to identify key areas where technology can optimize their operations and increase competitiveness.

Cost efficiency and market understanding:

Cost efficiencies for different production systems were reviewed, enabling decision-makers to make informed choices that balance the interests of different stakeholders while ensuring economic viability. Additionally, it enhanced the understanding of the produce value chain and key decision-makers and helped in optimizing supply chains and partnerships.

Accessibility and climate-adapted solutions:

The project provided information on accessible technologies and innovations for growers in Canada, particularly in addressing challenges related to food production in different climate zones. A focus on people and communities to foster social sustainability and to help promote equity by supporting growers in overcoming specific challenges they face.

TESTIMONIAL

"The Northern Ontario Farm Innovation Alliance (NOFIA) has been able to leverage the Horticulture Technology Roadmap for Northern Ontario. We have been able to present the report at our annual Northern Ontario Agricultural Conference to give examples on how producers might adopt technologies for labour savings, finding efficiencies or scaling up. We were inspired by the report to create a knowledge transfer event at the Growcer vertical farm facility on Manitoulin Island in December 2023, as well as an online event with a panel of Northern horticulturists in October 2023. Research and innovation for northern-adapted varieties and practices are of great importance to NOFIA and we are happy to support Vineland in their continued initiatives."

— Leia Weaver, Project Development Advisor

HOW VINELAND CAN SUPPORT YOUR BUSINESS

Through these roadmaps, Vineland assists clients in product, market and technology development. This helps them identify and address current challenges, prepare for future obstacles and enhance the profitability and sustainability of their businesses while minimizing risks.

Innovation adoption and increased efficiency:

In the short term, stakeholders such as growers can effectively adopt and utilize cost-effective technological solutions, which not only reduce operational costs but also enhance productivity of farming operations.

Validation and customization:

In the medium term, clients will conduct comprehensive testing and validation of technological solutions tailored to their specific needs. These solutions, designed for various operations, scales and environmental conditions, can then be fine-tuned to maximize effectiveness.

Strategic innovation:

Looking ahead in the long term, value chain members in the horticultural and related sectors will benefit from our roadmaps' focus on strategic R&D investments and contribute to scientific innovations and technological advancement through research in domains such as new plant variety development.

Inspiring success stories and building connections:

The roadmaps encompass the development of comprehensive case studies showcasing success stories of growers who have successfully integrated technological solutions to address major concerns. These real-world examples will serve as sources of inspiration and guidance for other industry groups looking to replicate such achievements. Additionally, they will aid various value chain members within and across the horticultural sector in networking and sharing their knowledge and experiences.

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