Ontario Horticulture Research Priority Report 2014
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Executive Summary

*Edible Horticulture Research Priorities*

The edible horticulture priority shortlist was developed in 2013 through an expert panel process using all of the commodity input. In consultation with the Ontario Fruit and Vegetable Growers Association, it was determined that this list should be kept essentially the same this year, with minor adjustments to reflect changes in the policy environment.

The priority “Reducing labour and increasing production efficiencies” was moved up from 3rd to 1st due to heightened pressures with the rising minimum wage this year and the particular impact it has on labour-intensive horticulture crops. Also, the 3rd priority in the “other” category was refined to specifically refer to labour and water policies. Therefore the new list is as follows:

*Research Priority List for OMAF & MRA’s Plant Production Systems Theme*

1) Reducing labour and increasing production efficiencies
2) Increased efficiencies in greenhouse production and strategies to extend the production season towards 12 months
3) New crop opportunities and import replacements
4) Integrated pest management and best management practices for honeybees and pollination services
5) New, higher value tree fruit and grape varieties
6) Enhancing raw product quality, consistency and productivity for the food processing market
7) New tools for weeds, pests and disease in field vegetables and ginseng

*Additional Priorities to be submitted to OMAF & MRA’s other themes*

− Water management in field vegetable crops
− Integrated research approaches to create growth and efficiency across horticultural value chains
− Integrated scientific, economic and policy research for the development of labour and water policies and to understand the impact of these policies on the horticulture sector

The commodity-specific priorities were originally developed in 2013 at a one day workshop co-hosted by the Ontario Fruit and Vegetable Growers Association and Vineland. In 2014, the commodity groups were given the opportunity to revise or update these priorities in consultation with their own members. Several groups took the opportunity to make some adjustments while others wished to maintain the same list. Therefore the short and long-term priorities included in this report represent the current needs for each commodity.
**Ornamental Horticulture Research Priorities**

**Floriculture**

The floriculture priorities were developed from the input provided at a national ornamental horticulture workshop in 2012. In 2014, they were reviewed at an informal workshop co-hosted by Flowers Canada and Vineland. At this workshop, the long-list was revised to create greater clarity and an OMAF-specific shortlist was created through a process that considered the current range of research activity.

*Research Priority List for OMAF & MRA’s Plant Production Systems Theme*

1. Reduce nutrient use. Reduce the amount of nutrients applied per unit and use nutrients more optimally to promote plant health, quality, shelf life and how they are most effectively administered to minimize leaching and runoff.
2. Technologies that optimise water and nutrient use. Develop, adapt, apply or identify technologies to optimize water and nutrient usage for common commercial production systems. Technologies and techniques that are easily adopted throughout the value chain, including consumers.
3. Improve consumer success with floral purchases. Identify changes in the production and distribution of flowering plants and point of sale messaging and include a knowledge transfer strategy.
4. Supplemental lighting. Strategies to improve the production potential of supplemental lighting.
5. Pest control. Improve the cost effectiveness of pest control to maximize yield at minimal cost.
6. Energy efficiency. Strategies to reduce heat, electrical energy and fuel use that are economically viable and commercially practical.

**Nursery-Landscape**

In November 2012, Landscape Ontario and Vineland Research and Innovation Centre co-hosted a workshop for representatives from across the nursery-landscape sector to discuss the needs and opportunities within the sector where research and innovation could have the biggest impact. The priorities developed at that meeting were reviewed by Landscape Ontario in 2014 and updated as follows:

1. Understanding the consumer and developing strategies to stimulate consumer demand
2. Improving Water and Nutrient Management
3. Reducing Labour
4. Alternative Pest Management strategies for landscape, including turf
5. Improving the success of plantings in different environments
Ontario Horticulture Research Priority Report

June 2014

Introduction

Innovation and research can be a driving force that enhances growth, profitability and sustainability in any sector, including horticulture. However, to achieve the greatest impact from investments in research and innovation, there is a need for a co-ordinated, strategic approach that achieves a balance of both short and long term goals.

Defining a research strategy for a large, diverse sector such as horticulture is a challenging task that requires input from many different groups. The best outcomes will be achieved through open dialogue and interaction between Industry who bring the “need” and Science who can provide “what’s possible”.

As part of our commitment under Growing Forward 2, Vineland Research and Innovation Centre (Vineland) is responsible for collecting the Ontario horticulture industry’s research priorities. The priorities are used as input for OMAF & MRA’s priority setting system, they are used to shape Vineland’s own research strategy and they are provided to Agriculture and Agri-Food Canada and other research providers to assist them in meeting the needs of the Ontario industry. Vineland’s role in the process is simply as a facilitator, the actual delivery of research projects will continue to include the University of Guelph, AAFC, Vineland and other Ontario research providers.

Approach

The approach Vineland takes in facilitating the priority setting process emphasizes representation from the full value chain to ensure that the priorities address the broader needs and opportunities of the sector. Priority-setting is an evolving process for which we work with the major sector organizations to design a workshop and an invite list that will achieve these goals while acknowledging the challenges of bringing together what can be disconnected or even competing groups within the sector. Participants include growers and representatives from along the value chain as well as relevant researchers, AAFC and OMAF & MRA staff and the meeting is chaired by an independent facilitator. Participants are encouraged to take a big picture view of the long term growth and sustainability of their sector in order that the priorities achieve a balance of long and short term goals.
In general, the approach consists of two phases, the first is to collect a full list of research needs, issues, opportunities and ideas that is unconstrained by the availability of funding or expertise. The second phase is to organize and prioritise this list. The two phases may be conducted within the agenda of a single meeting or as two separate processes.

As research priorities generally remain fairly consistent from one year to the next, formal priority setting will not be conducted every year but instead the process will evolve into a rotating schedule of meetings that address each sub-sector of horticulture every two to three years. However, this report will be prepared on an annual basis and industry groups will be given the opportunity to update their priority list if necessary.

**Note:** Within this document, numbering has been used to indicate ranking of priorities. For research topics that are equally ranked and/or did not undergo a ranking process, plain bullet points have been used.
Edible Horticulture

Consultation and Prioritisation Process

Phase 1: Defining Research Needs
The Ontario Fruit and Vegetable Growers Association and Vineland co-hosted a one day research strategy workshop in February 2013. Representatives from across the edible horticulture sector, government and research came together to discuss the issues and opportunities within the sector and outline some priority areas for research and innovation.

The format of the workshop was designed to: 1) Encourage long-term thinking – to address the question “Where do you want to be ten years from now?”; and 2) Introduce a broader value-chain perspective to the research and innovation discussion.

Each commodity group was invited to nominate two representatives to participate on their behalf and a number of researchers were invited to contribute their expertise. The first part of the workshop agenda included a number of short presentations from growers, produce marketing and grocery retail to provide the value chain perspective. Following the speakers and a general discussion of trends and issues within the sector, the agenda switched focus onto individual commodities, one at a time. In order to save time during this part of the agenda and to focus the discussion on long-term thinking, each commodity group was required to pre-submit a completed questionnaire consisting of the following questions.

- Provide your top three short-term priorities for research investment. Note that “short-term” refers to something that could be achieved in a small-scale research project of 1-3 years duration.
- Is your industry, growing, stable or in decline?
- What are the main barriers preventing your industry from thriving and/or growing?
- Who are your main competitors outside of Ontario and what are they doing better?
- What are the main factors that influence your profit margin?
- What are the main factors that impact the quality of your product?
- What do you see as major opportunities in your industry?
- Based on your answers to the above questions, what do you think research and innovation could provide?

The compiled documents were provided to all participants and used as the basis for a discussion of issues and opportunities within each commodity. After these discussions, breakout groups were self-assembled from two or more commodity groups who worked together with one or two researchers to translate their
issues and opportunities into long term research topics. The industry members within each group then ranked these research topics in order to identify their top three long term priorities. Short term priorities were not discussed during the workshop but have been recorded directly from the questionnaires.

The top three short and long term priorities for each of the 13 major commodity groups in the edible horticulture sector were defined in a set of meeting notes that was circulated to meeting participants and have been included here in Appendix A.

**Overarching Themes**

During the course of the day’s discussions, a number of commonalities became apparent across several commodities. These are defined below as a set of overarching themes which together encompass virtually all of the research priorities as defined per commodity.

- Improving Production Efficiency
- Product Innovation
- Consumer and Market Research
- Crop Protection
- Enhancing Product Quality

**Phase 2: Prioritisation**

A second phase of research prioritisation was undertaken specifically for the purposes of guiding OMAF & MRA’s investment in horticulture research through its competitive research granting programs. Given the environment of fiscal restraint and the impossibility of addressing the full spectrum of research required, this more rigorous prioritisation step allows the most impactful opportunities and issues to be identified.

It is important to note that these phase 2 priorities do not preclude investment in other research needs, through other funding programs.

The phase 2 prioritisation process was based on the established “Delphi method” which is a consensus-building approach that uses an expert panel and a system of anonymous scoring to establish a shortlist of top priorities. The expert panel consisted of 9 respected individuals that together possess extensive knowledge of the sector that crosses commodity boundaries and spans the complete value chain. The list of participants is included in Appendix A.

The top short and long term priorities for each commodity in the edible horticulture sector that were identified at the February workshop were used as the input or starting point for this discussion. Panel members were asked to review this list of commodity research priorities prior to the meeting to identify their “top ten” that met the criteria outlined below.

The top ten lists from all the panel members were compiled and only those research topics that were selected by two or more members were kept for discussion. These topics were discussed by the panel who were also invited to nominate additional non-commodity specific research topics and/or argue for the inclusion of others that were not shortlisted. A few similar topics were grouped together. Research topics were then scored based on the following criteria:
Scores were tallied and the bottom five research topics were eliminated. Another round of discussion and scoring was completed followed by a review and further discussion to achieve consensus on the final priorities. This prioritisation process resulted in a top ten list that consists of seven priorities that fit within OMAF & MRA’s Plant Production Systems theme and a further three priorities to be assigned to other themes.

2014 Update

As described above, the edible horticulture priority shortlist was developed in 2013 through an expert panel process using all of the commodity input. In consultation with the Ontario Fruit and Vegetable Growers Association, it was determined that this list should be kept essentially the same this year, with minor adjustments to reflect changes in the policy environment.

Within plant agriculture, horticultural crops are particularly labour-intensive and in most cases, labour makes up the largest single component of production costs. The rising minimum wage this year heightens this pressure on the horticultural sector and is something that is felt across all commodities. Therefore, the research priority “Reducing labour and increasing production efficiencies” was moved up from 3rd to 1st and the 3rd priority in the “other” category was refined to specifically refer to labour and water policies. The revised shortlist is presented in the following section.

In addition, this year, individual commodity groups were invited to revise or update their commodity-specific priorities in consultation with their own members. Several groups took the opportunity to make some adjustments while others wished to maintain the same list. Therefore the short and long-term priorities included in this report represent the most up-to-date needs for each commodity.
Edible Horticulture Research Priority Shortlist

For OMAF & MRA’s Plant Production Systems Theme

1) Reducing labour and increasing production efficiencies
2) Increased efficiencies in greenhouse production and strategies to extend the production season towards 12 months
3) New crop opportunities and import replacements
4) Integrated pest management and best management practices for honeybees and pollination services
5) New, higher value tree fruit and grape varieties
6) Enhancing raw product quality, consistency and productivity for the food processing market
7) New tools for weeds, pests and disease in field vegetables and ginseng

Additional Priorities to be submitted to OMAF & MRA’s other themes

- Water management in field vegetable crops
- Integrated research approaches to create growth and efficiency across horticultural value chains
- Integrated scientific, economic and policy research for the development of labour and water policies and to understand the impact of these policies on the horticulture sector
Edible Horticulture Research Priorities by Commodity

**Apples**

**Short Term Research Priorities:**
1) Integrating new pesticides into current production systems
2) Post-harvest strategies for optimal apple quality
3) Research to support marketing strategies and new product development

**Long Term Research Priorities:**
1) Sustainable Integrated Pest Management Systems
2) Crop Cultural Management Strategies:
   – In-field maturity assessment
   – New variety/cultivar development and evaluation
   – Rootstock evaluation
   – Cultural practices for optimum yield and marketability
3) Increased production efficiencies:
   – Mechanization
   – Crop protection
   – Weather mitigation – frost, drought

**Asparagus**

**Short Term Research Priorities:**
1) Disease management
2) Research into equipment to reduce labour

**Long Term Research Priorities**
The long term research priorities for Asparagus were developed jointly with Fresh Vegetable, Muck Crops, Garlic and Ginseng and were defined for all three groups as follows (this list has been repeated in each section).

1) Specialization and collaboration:
   – Value chain efficiencies
   – Decrease Cost of Production
   – Diversification
2) Education and health benefits:
   – Farm and food in the classroom (curriculum)
   – Relationship and consumer building
3) Science and research driven food and farm policy
Berries

Note that this category also includes high bush blueberries.

**Short Term Research Priorities:**

1) Insect and Disease Management
   - Virus Complex
   - Spotted Wing Drosophila
   - Anthracnose
   - Western Flower Thrips
   - Soil borne diseases
2) Product Quality and Marketing
3) Weed Management

**Long Term Research Priorities**

1) Breeding and Evaluating New Cultivars
2) Production Efficiency
3) Pest Management Products

Fresh Vegetables, Muck Crops and Garlic

**Short Term Research Priorities**

1) Crop input, savings and new efficiencies
2) Water management savings and efficiencies
3) New and effective tools to combat weeds, disease and pests

**Long Term Research Priorities**

The long term research priorities for Fresh Vegetable, Muck Crops and Garlic were developed jointly with Asparagus and Ginseng and were defined for all three groups as follows (this list has been repeated in each section).

1) Specialization and collaboration:
   - Value chain efficiencies
   - Decrease Cost of Production
   - Diversification
2) Education and health benefits:
   - Farm and food in the classroom (curriculum)
   - Relationship and consumer building
3) Science and research driven food and farm policy
**Fruit and Vegetable Processing**

Note that this section identifies the needs of the fruit and vegetable processing companies as well as the growers who supply them. Each group has unique short term needs which are defined here but for the long term strategic priorities, both groups recognized the importance of integration along the value chain and came together to define an overarching set of priorities for the processing sector.

**Short Term Research Priorities for Processing Vegetable Growers:**
1) Crop protection registrations  
2) Strategies for bacterial disease control (tomatoes) and downy mildew control (cucurbits)  
3) Variety research

**Short Term Research Priorities for Processors:**
1) Branding Ontario &/or clarify Product of Canada labeling standards (‘research’ consumer’s desires);  
2) Food safety aspects of imports vs. domestic;  
3) Exploring the area of packaging - what is the consumer looking for and what can drive business (especially for cans);

**Long Term Research Priorities**
The following represent the long term priorities for the fruit and vegetable processing sector which includes both growers and processors.

1) Processing and packaging innovations:  
   – New packaging products  
   – New processing technologies - scouting, development and adaptation  
   – Process improvements for maximum efficiency, minimum waste and minimum water usage  
2) Customer (end user or industry) research to understand packaging and product needs and opportunities for Ontario product;  
3) Enhancing raw product quality, consistency, and productivity:  
   – Alternative/new pest control technologies  
   – Plant varieties and production techniques  
   – Soil health
**Ginseng**

**Short Term Research Priorities**
1) Understand the causes of replant disease and assess current technologies for management of replant disease of ginseng
2) Assess existing technologies for management of soil-borne pathogens in ginseng
3) Characterization of ginseng wash-water quality and identification of economical wash-water treatment techniques

**Long Term Research Priorities**
1) Develop new practices for management of replant disease and other soil borne-pathogens
2) Identification of the factors that lead to pesticide residues in ginseng and develop remediation techniques.
3) Improved post-harvest handling practices

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**Grape and Wine**

**Short Term Research Priorities**
1) Winter injury
2) Quality improvement
3) Pest and disease control

**Long Term Research Priorities**
1) Address grapevine health uncertainty in Canada
   - Identify, evaluate and ensure the domestic industry has access to superior plant material
   - Establish industry-led nuclear grapevine repository and national certification standards
   - Identify the extent of pest presence in Ontario vineyards
2) Increase both quality and profitability in existing areas of success
   - Measurement of production performance
   - Benchmarking plant health issues
   - Identify and assess clones of important grape varieties
3) Facilitate domestic wine production’s further penetration of the domestic wine market in proven, high demand market segments
   - Supply/demand profile for domestic grape production
   - Identify and quantify grape production influences affecting efficiency and quality of production
**Greenhouse Vegetables**

**Short Term Research Priorities:**
1) New greenhouse coverings and screens for improved production and improved energy efficiency
2) Investigate new biocontrol agents and optimize the use of biocontrols that are currently available to greenhouse vegetable growers
3) Identification of viruses in vegetable greenhouses and resistance of current varieties to these viruses

**Long Term Research Priorities**
1) Twelve month production of quality products;
2) New Markets:
   - Food service
   - New products;
3) Production efficiency

**Honey Bees and Pollination**

**Short Term Research Priorities:**
1) Integrated Pest Management Strategies for honey bee pests and diseases
2) Best Management Practices for pesticides used on agricultural crops that reduce risk to honey bee health
3) Nutritional Requirements for honey bees used for pollination services

**Long Term Research Priorities**
1) Pest and disease:
   - Management
   - Treatments
2) Bee Breeding, Queen and nucleus colony production:
   - Resistance
   - Numbers
3) Best management practices for pollination services:
   - Nutrition
   - Pest/disease
   - Transportation
Mushrooms

Short Term Research Priorities
1) Labour Productivity, Sourcing & Training
2) Consumer education
3) Energy efficiency

Long Term Research Priorities
1) Reduce costs
   – Labour productivity
   – Energy efficiency
2) Improve production efficiencies
   – Alternative ingredients for mushroom growing substrate
   – Guidelines to minimize malodours in mushroom substrate composting
   – Guidelines for worker safety on mushroom farms

Potatoes

Short Term Research Priorities
3) Water Management: Precision and variable rate strategies for irrigation.

Long Term Research Priorities
1) New variety development
   – Early maturity
   – Low N, P, K requirements
   – Disease resistance –esp common scab, silver scurf, verticillium, late blight
   – Tolerance to drought and other environmental stresses
2) Market Development
3) Reducing production costs
**Tender Fruit and Fresh Grapes**

**Short Term Research Priorities:**
1) Increased labour and operational efficiencies:
   - Maximizing crop load of larger sized fruit
   - Mechanized harvesting
   - Pack line automation
2) Increased post harvest quality:
   - Optimal harvest dates and storage regimes
   - Environmentally sustainable packaging to increase shelf life
3) Consumer market research to target value added products to the consumers who will purchase them

**Long Term Research Priorities:**
1) New, higher value varieties suited to Ontario growing conditions, pest pressures and marketplace needs;
2) Research on optimal quality specs, harvest dates, storage and packaging;
3) Operation management systems to increase production efficiencies:
   - Automation (packing) and mechanization (harvesting)
   - Crop protection
   - Weather mitigation
   - Faster fruiting capacity
Ornamental Horticulture

Floriculture Consultation and Prioritisation Process

In December 2012, Vineland Research and Innovation Centre, in partnership with the Canadian Ornamental Horticulture Alliance (COHA), organized a national innovation strategy workshop. This event enabled sector leaders from across Canada to actively engage in the development of research priorities in a strategic context. Stakeholders provided input into the development of this strategy through this consultative forum.

Flowers Canada Growers is one of the three founding partners of COHA which also includes the Canadian Nursery Landscape Association (CNLA) and la Fédération Interdisciplinaire de l'Horticulture Ornementale du Québec (FIHOQ). Each of the three organizations brought forward their research needs for discussion and prioritisation into a National Ornamental Horticulture Research Strategy which outlines nine overarching priorities for the sector.

The floriculture-specific priorities and the ranking outlined below were extracted from the input provided at this national workshop as well as from the 2011 Ontario Floriculture research meeting co-hosted by Vineland and Flowers Canada (Ontario). The priorities were further discussed and refined by members of the Flowers Canada (Ontario) research committee and represent the priorities of both the Ontario and Canada-wide floriculture sector.

2014 Update

This year, the existing floriculture research priorities were revisited in an informal workshop to review and narrow down the list based on an assessment of the current research landscape. The workshop participants included members of the Flowers Canada research committee along with a relevant researcher from each of the University of Guelph, Vineland and Niagara College and an OMAF crop specialist. The two goals of the workshop were addressed as follows:

1. Clean up the Long List
   The group discussed the current priority long-list and identified those that overlapped with others, removing, combining and rewording some of the priorities to create greater clarity. In some cases, more specific wording was added to convey the need for practical, commercially relevant solutions. Priorities were also edited where necessary to ensure they were goal-oriented and did not limit researchers to a specific approach or technology. To preserve the integrity of the original consultative process, the scope and ranking of the priorities was kept the same as the original.
2. Create a Shortlist for the OMAF&MRA system
Participants discussed research projects currently underway in Ontario and across Canada then, considering this in combination with the updated list, anonymously voted for a set of 5 priorities to be shortlisted. The votes were tallied and priorities that scored three or less were eliminated. The ranking of the final priority shortlist was determined by dividing the original ranking by the number of votes it received.

Floriculture Research Priorities

Shortlist for OMAF & MRA’s Plant Production Systems Theme

1. Reduce nutrient use. Reduce the amount of nutrients applied per unit and use nutrients more optimally to promote plant health, quality, shelf life and how they are most effectively administered to minimize leaching and runoff.

2. Technologies that optimise water and nutrient use. Develop, adapt, apply or identify technologies to optimize water and nutrient usage for common commercial production systems. Technologies and techniques that are easily adopted throughout the value chain, including consumers.

3. Improve consumer success with floral purchases. Identify changes in the production and distribution of flowering plants and point of sale messaging and include a knowledge transfer strategy.

4. Supplemental lighting. Strategies to improve the production potential of supplemental lighting.

5. Pest control. Improve the cost effectiveness of pest control to maximize yield at minimal cost.

6. Energy efficiency. Strategies to reduce heat, electrical energy and fuel use that are economically viable and commercially practical.

Floriculture Research Priority (Long) List

1. Water and Nutrient Management
   - Reduce the amount of nutrients applied per unit and use nutrients more optimally to promote plant health, quality, shelf life and how they are most effectively administered to minimize leaching and runoff.
   - Develop, adapt, apply or identify technologies to optimize water and nutrient usage for common commercial production systems. Technologies and techniques that are easily adopted throughout the value chain, including consumers.
   - Strategies to reduce water use including research to understand how much water the plant requires and when and how it is best administered from production to consumer level.
   - Develop better solutions to waste water management (in which there are nutrients dissolved in solution) both by reducing the risk of contamination through discharge to external watercourses and groundwater, and by more optimal nutrient use.
2. Consumer and Market Research

− Identify changes in the production and distribution of flowering plants and point of sale messaging and include a knowledge transfer strategy to ensure consumers enjoy full success with their floral purchases.
− Strategies to create market differentiation and communicate to consumers regarding the use of environmentally sustainable growing practices e.g. biological control
− Identify criteria and key purchase drivers for each generational demographic segment and the trends for different plant categories
− Understand the needs and expectations of immigrant Canadians and the corresponding market opportunity

3. Complete an integrated pest management strategy for every crop and production system

− More effective biocontrol agents for aphids
− Improve the cost effectiveness of pest control to maximize yield at minimal cost
− Determine the compatibility of mutual interactions among agents to have a responsive biocontrol management system for diseases and pests
− Crisis response research in order to rapidly identify the pest or disease issue and determine how it can most effectively be addressed
− Biosurveillance to document and record disease and pest pressures and track how they are changing

4. Energy Efficiency

− Strategies to reduce heat, electrical energy and fuel use that are economically viable and commercially practical
− Strategies to improve the production potential of supplemental lighting

5. Environmental Best Practices

− Reduce the carbon footprint of the production cycle in greenhouse crops (bedding plants, potted flowering crops, cut flowers, etc.)
− Reduce the use of plastic materials in production equipment and containers by identifying better alternatives
− Recover value from co-products

6. Product Innovation

New varieties and traits that meet consumer needs (in the garden and in the home) and which confer a competitive advantage on the Ontario value chain – plant breeding as well as imported variety trials. Traits of interest include uniqueness, extended flower life, drought resistance, heat tolerance. New products that can become “signature” plants for Ontario growers and that enable royalties from breeders’ rights to flow back here.

7. Labour Productivity

Develop, adapt, apply or identify robotic and other automation tools that maximise worker productivity and reduce injury and are able to adapt to multiple crops.
Nursery Landscape Consultation and Prioritisation Process

In November 2012, Landscape Ontario and Vineland Research and Innovation Centre hosted a workshop for select representatives from across the nursery-landscape sector to discuss the needs and opportunities within the sector where research and innovation could have the biggest impact.

The participants represented the entire nursery-landscape value chain including: growers; landscape designers, contractors and service providers; municipalities and government; retail; industry organisations and researchers.

For the purposes of the research priority discussion, the Nursery-Landscape sector was defined as the entire nursery-landscape value chain from production through to retail, services and maintenance. This includes:

- nursery and sod production
- wholesale, retail and distribution
- landscape design, installation and maintenance
- arboriculture
- lawn care

Due to a need to align within the scope of the Ontario Ministry of Agriculture, Food and Rural Affairs, some industries within the landscaping sector such as paving, lighting and snow removal were not covered. In addition, the specialised needs of sports turf and golf course management were not discussed as they are addressed effectively through the Guelph Turfgrass Institute.

Short presentations were given by four representatives that interact with different subsets of the market. Their different perspectives provoked some thoughtful discussion and revealed many commonalities including the observation that nursery-landscape consumers can be grouped into three distinct consumer groups with different needs:

- High-end clients of designers and landscape services;
- Home gardeners and do-it-yourselfers; and
- Institutional and Government e.g. Municipalities, Conservation Authorities, Ministry of Transport.

These presentations led into a broad discussion of sector issues, a SWOT analysis and a ten year vision exercise. Out of this discussion, participants were invited to define research topics which were then grouped and evaluated using an anonymous scoring system based on the following criteria:

- Size of Opportunity or Problem
- Economic Impact
- Socio-Environmental Impact
- Probability of Success

Researchers and others with a perceived conflict of interest were excluded from the scoring process. The results were tallied to produce the prioritised list outlined below.
2014 Update

Landscape Ontario were invited to review and update the 2013 priority list which they did at a March 2014 meeting of their growers group. The group condensed the priority list and re-ordered some of the items as per below.

Nursery- Landscape Research Priorities

The descriptions beneath each heading provide a brief explanation of the research topic and attempt to capture some of the individual research suggestions that came forward at the original consultation. However, these should be viewed as suggestions and do not preclude other research approaches that address the overall goal.

1) Understanding the consumer and developing strategies to stimulate consumer demand

This area of research was seen as critical to understanding the needs of the consumer in order to develop marketing and education strategies as well as for product development. It is also critical when considering the long timelines in the nursery sector – growers need to know what to plant today that their consumer will be buying ten years from now.

2) Improving Water and Nutrient Management

Water is recognised as a major issue for growers in this sector and it is increasingly also becoming a consumer issue as everyone faces tightening water restrictions. Similarly, nutrients are an essential part of growing healthy plants and can be a costly input. Effective management of fertilisers and nutrients is important for growers, landscape maintenance companies and consumers alike and disposal, leaching and runoff can create unwanted environmental consequences.

3) Reducing Labour

The nursery-Landscape sector is recognised as being very labour intensive, with very little use of automation. High labour costs impact profit margins and are a clear target for research and innovation. Research in this area could include development or adaptation of technologies for various processes such as container handling, weed spraying, or other efficiency improvements.

4) Alternative Pest Management strategies for landscape, including turf

Nursery and turf growers as well as landscape contractors and home owners currently have very few available products for controlling pests and disease. Potential research topics include the development and optimisation of biocontrol agents and other natural products.

5) Improving the success of plantings in different environments

There is a need to improve the customer’s “success” with landscape plantings. Research could include defining the plant species and varieties suitable for given environments, developing
strategies for improving plant survival in stressful conditions, or identifying combinations of species suitable for different maintenance regimes.

Appendix A: Edible Horticulture Expert Panel Members 2013

Participants in the Expert Panel to determine a research priority shortlist for Ontario Edible Horticulture in April 2013 were as follows:

- Jim Brandle, CEO Vineland Research and Innovation Centre
- Odile Carisse, Plant Pathologist, Agriculture and Agri-Food Canada, St Jean-sur-Richelieu QC
- Hector Delanghe, Grower, Former President Canadian Horticultural Council
- John Kelly, Vice-President Erie Innovation and Commercialization
- Al Mussell, Senior Research Associate, George Morris Centre
- Bruce Nicholas, General Manager, Ontario Food Terminal Board
- John Scott, Former President, Canadian Federation of Independent Grocers
- Art Smith, CEO Ontario Fruit and Vegetable Growers Association
- David Wolyn, Plant Breeder, University of Guelph

Also present:

- Karen Chan, Assistant Deputy Minister, OMAF & MRA (observer)
- Tania Humphrey, Research Strategy and Programs Manager, Vineland (organiser)
- Ken Knox, Knox Innovations (facilitator)
- Mike Toombs, Director Research and Innovation Branch, OMAF & MRA (observer)