vineland

RESEARCH & INNOVATION CENTRE




Urban Tree Value-Chain Research Priority Setting Workshop

Report on the Findings

February 2021

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About Vineland

Vineland Research and Innovation Centre (Vineland) is a not-for-profit organization that focuses on research for horticulture in Canada with a vision of creating a vibrant, prosperous, and sustainable horticulture industry. Vineland recognizes that plants and soils are the fundamental components of a living green infrastructure that delivers environmental, economic and social benefits. Our Innovation Strategy and Research Program structure at Vineland reflects our commitment to supporting the value-chain to tackle the challenges and opportunities.

The Plant Responses and the Environment program is one of the five research programs at Vineland. A pillar of the Plant Responses and the Environment program is to enhance evidence of horticultural products as natural solutions through active experimentation, testing and demonstration. To address this, Vineland works with partners across Canada and develops models and specifications to improve the performance of vegetation and green infrastructure design to ensure lasting impact for the industry.

For more information and to stay up-to-date on current and upcoming research, visit and register at greeningcanadianlandscape.ca.

Overview

The increasing demand for nature-based climate solutions represents a significant opportunity for the entire urban tree value-chain. This growing demand, however, has pointed to a critical gap in identifying and addressing research needs amongst stakeholders represented in this very diverse group.

Simply stated, there are numerous environmental challenges that affect the long-term health of urban forests. Vineland has already undertaken steps to address some of the key research priorities of the value-chain. However, increased demand for applied research-based solutions from several sectors within the value-chain has highlighted the need to develop a more collaborative model for research that connects, and is supported by, stakeholders throughout the entire value-chain.

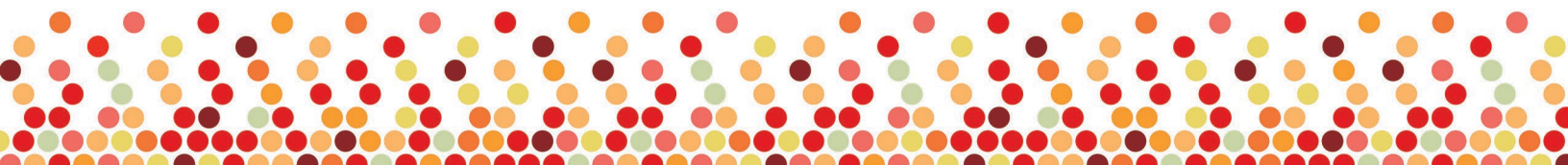
In short, a new research approach is needed to support the urban tree value-chain in Canada. As a starting point, we have identified key objectives for a new research-funding model in order to define and critically evaluate the candidate models' suitability with respect to industry needs.

To achieve these objectives, Vineland has engaged in an initiative to explore partnership models, which will map out and better connect the entire value-chain. The outcomes of this initiative will allow for greater alignment of research priorities, potential for co-funding, greater transparency and communication about market trends, and new opportunities that result from government policy initiatives on issues such as climate change and green infrastructure. Ultimately, we have determined that the use of Consortium Research is the most effective model and propose the **Greening the Landscape Research Consortium** as an innovation hub for the urban tree value-chain.

On February 9th 2021, Vineland hosted a virtual research priority setting workshop for the Urban Tree Value-chain supported by Agriculture and Agri-Food Canada's 'Canadian Agriculture Strategic Priority Program'. The workshop was facilitated by James Allen from Creative Huddle and attended by participants from across the Canadian urban tree value-chain. In total, there were 50 participants in attendance for the workshop. The full list of participants and their affiliations can be found in Appendix A, but in brief, participants included people from various actor groups including nursery producers, landscape contractors, landscape architects, landscape designers, municipalities, nursery-landscape associations, as well as representatives of Vineland's project team.

The purpose of the workshop was to bring together actors across the value-chain to identify research priorities for the near and long-term future and engage in discussion on how to make the research consortium model function in such as way as to effective tackle the priorities identified.

In this report we provide the results from the workshop as well as our proposed next steps to support the proposed Consortium Research.



Research Priorities

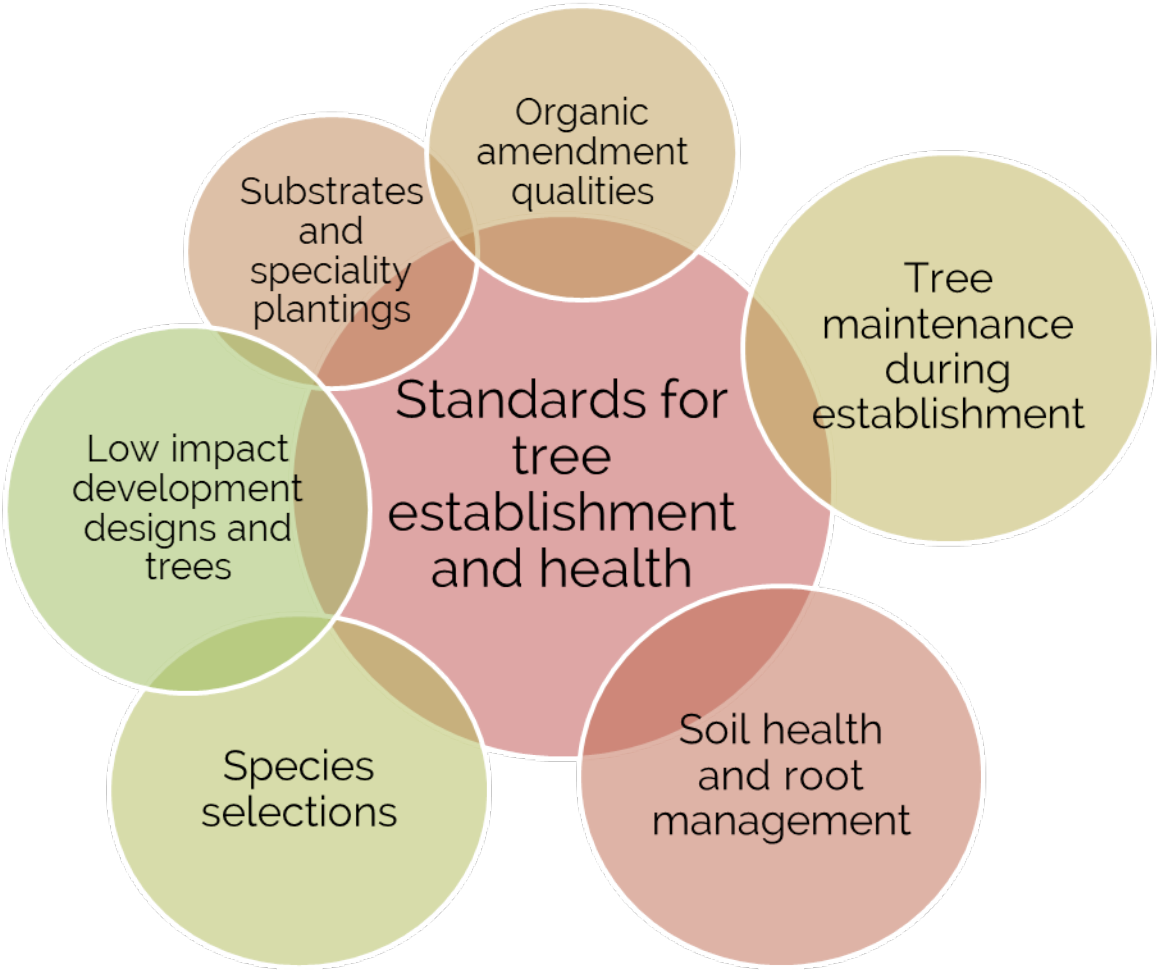


Figure 1. The common research needs that Vineland has identified as areas of focus for the Urban Tree Value-Chain. The size of the spheres provides rough indications of the relative importance of the research topics across the value-chain and overlapping spheres indicate where there are areas of coinciding interest between topics.

Ahead of the workshop, participants received an information packet, which included background information about the project as well as an overview of the research priorities we had identified for the urban tree value-chain (**Figure 1**). In the first breakout session, workshop participants were placed in discussion groups according to their role within the value-chain (i.e. their actor group) and asked to provide responses to a series of discussion questions relevant to these identified research priorities, recording key points on a designated virtual discussion board (see Appendix B). There were seven groups in total, two nursery producer groups, one landscape supply group, three municipality groups and one group comprised of consultants and designers. The tasks presented to each group are outlined in 'Overview: Breakout Session 1' box below.

Overview: Breakout Session 1

Task 1: Reflect on the research priorities presented and consider the following questions:

- Are there any priorities missing from the list?
- Are there priorities you disagree with on the list?

Task 2: Ranking of the list by urgency for your sector (summarize any areas of disagreement). Consider the following questions to make your ranking:

- What priorities are integral to the success of your sector today? 5 years from now? 10 years from now?
- What priorities need to be addressed to establish the underlying knowledge and understanding needed to follow up on subsequent priorities? (i.e. how do the priorities relate to each other, do certain priorities need to be addressed in order to gain the understanding needed to take on others?

Ranking of Research Priorities

To determine the top research priorities, we reviewed the discussion boards and notes generated by the seven breakout groups. Four of the research priorities presented in **Figure 1** were discussed in detail by the groups The three remaining research priorities, Low Impact Development, Organic Amendments and Specialty Substrates, were consistently not included in the groups' rankings, were not discussed at all and/or were included in the discussion as sub themes of the other research priorities

Three central research priorities emerged from Breakout Session 1. Based on the rankings assigned by the seven groups, the order of research priorities as ranked by participants is as follows:

1. Tree maintenance during establishment
2. Soil standards for tree establishment
3. Nursery soil health and root management

Research Priority Sub Themes

Important subthemes for each of the priorities emerged during the first breakout session. In order to capture those subthemes and assign a relative importance ranking to them, we have created **Figures 2-5**. These figures depict the top four research priorities as ranked by workshop participants. To analyze discussion outcomes (located in Appendix B) we reviewed each of the discussion boards from Breakout Session 1. Vineland team members also provided their own notes taken during the discussion which offer context and in some cases, additional mentions of sub themes within each priority area.

Based on the discussion boards and notes, we assigned a rank to the sub themes according to the number of times each sub theme was mentioned. The figure depicts the sub themes as ranked by mention; the larger and darker the bubble, the more mentions the sub theme received. Where Breakout Session 1 one was centered on generating discussion amongst

participants within a given sector, highest ranked sub themes reflect ideas and interests that were raised not only more frequently but more consistently across sectors and constitute shared and common interests relevant to the entire urban tree value-chain.

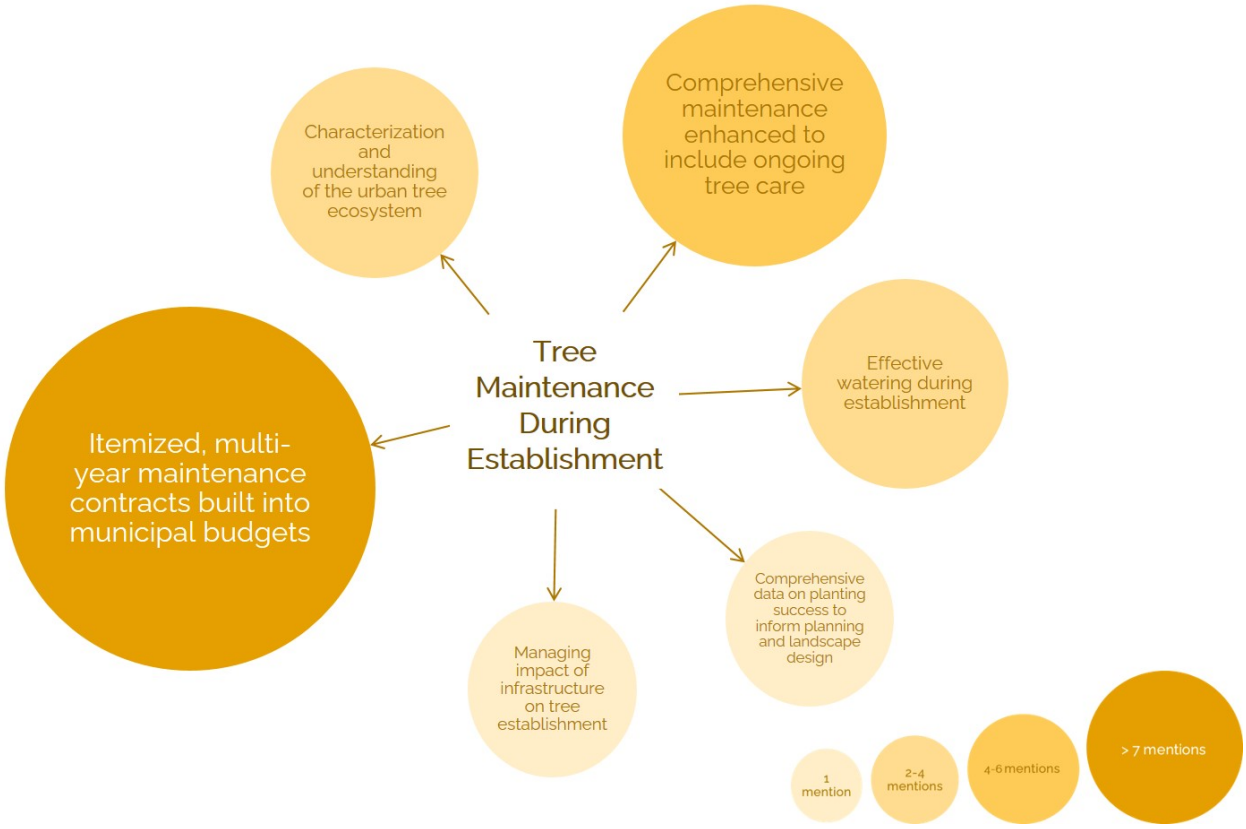


Figure 2 Highest ranked research priority area, Tree Maintenance and Establishment with sub themes identified during discussion ranked by number of mentions.

Tree Maintenance and Establishment was the highest ranked research priority area. Six sub themes emerged in the discussion with "*itemized, multi-year maintenance contracts built into municipal budgets"*, receiving the most mentions across and within discussion groups (>7 mentions). Other sub themes that emerged included mentions of specific areas of need related to tree care as well as mentions of "*infrastructure"* and "*landscape design".*

Figure 3 Second highest ranked research priority area, Soil Standards for Tree Establishment with sub themes identified during discussion ranked by number of mentions.

Soil Standards for Tree Establishment was the second highest ranked research priority area. Seven sub themes emerged in the discussion with "*geographically relevant soil research and specifications*" receiving the most mentions across and within discussion groups (4-6 mentions). The next two sub themes that received the most mentions both also mention specifications in some capacity, such as "*specifying adequate soil volume at the design level"* and "*establishing consistent minimum design standards and specifications".* Of note here, is that "*low impact development strategies for soil"* was mentioned as a sub theme for this research priority (1 mention) but was not discussed by any of the groups as an individual research priority even though it was presented as such (**Figure 1**). Although low impact development is a burgeoning area of research and technical practice, the participants identified it as a component of an improved soil standard for trees and not a stand-alone research priority area.

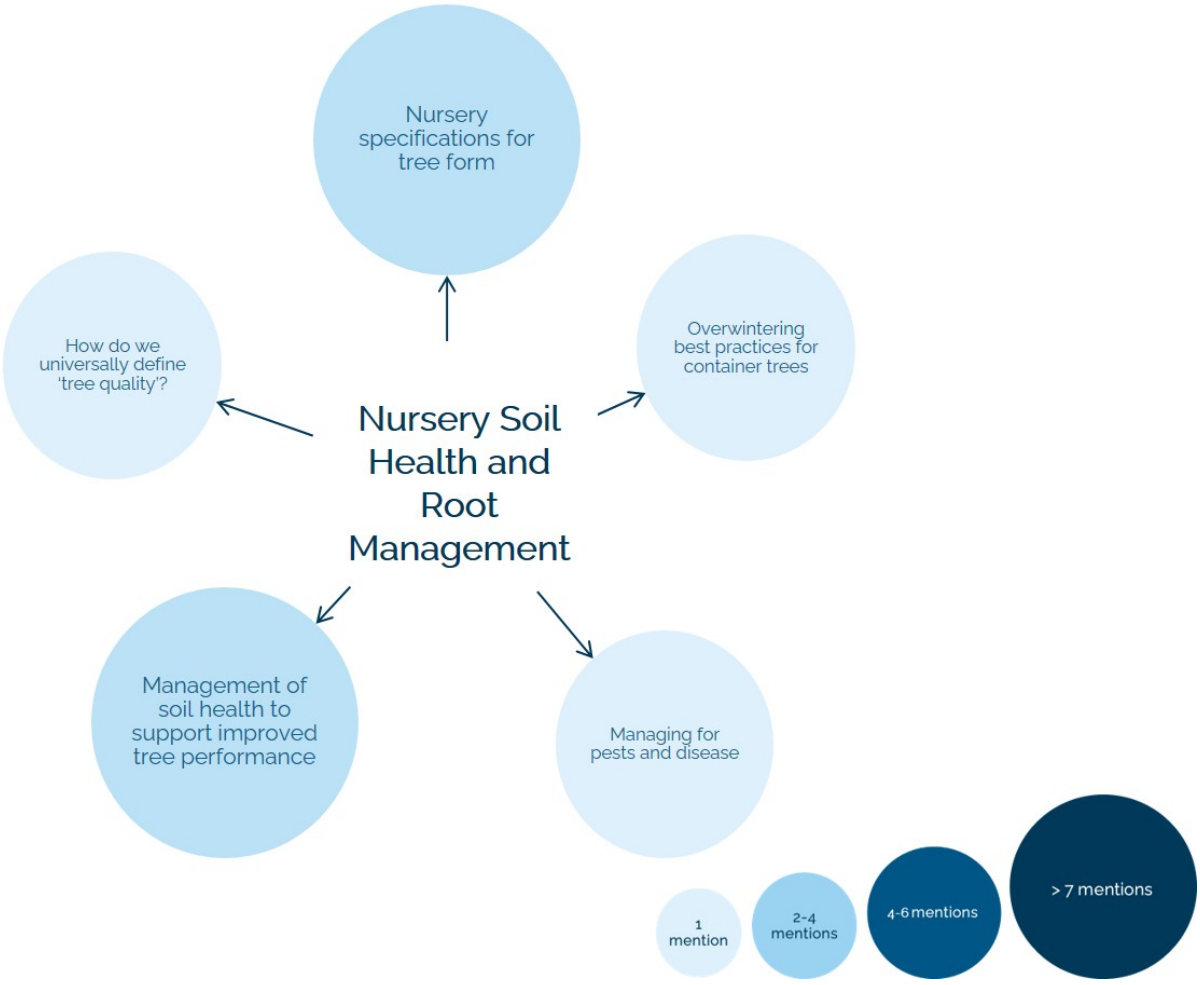


Figure 4 Third highest ranked research priority area, Nursery Soil Health and Root Management with sub themes identified during discussion ranked by number of mentions.

Nursery Soil Health and Root Management was the third highest ranked research priority area. Five sub themes emerged in the discussion. The most highly discussed sub themes, "*nursery specifications for tree form"* and "*management of soil health to support improved tree performance"* each received 2-4 mentions.

Figure 5 Fourth highest ranked research priority area, Tree Species Selection with sub themes identified during discussion ranked by number of mentions.

Tree Species Selection was ranked fourth of the seven identified research priority themes. It was discussed by two groups, however the resulting discussions as demonstrated in **Figure 5**; were far less focused than that of the other priority areas, with many sub themes emerging and fewer overall mentions per sub theme. This suggests that further narrowing of informational needs and priority areas is necessary to determine what evidence gaps are lacking.

Implementing the Value-chain Approach for Research

In the second breakout session, discussion groups were designed to facilitate more diverse and integrated priority setting, by mixing the various actor groups and ensuring the entire value-chain was represented in each designated group. There were six groups in total. Each group was assigned one of the top three research priorities that emerged during the first session whereby two groups were assigned to discuss one of (i) Tree Maintenance During Establishment, (ii) Soil Standards for Tree Establishment or (iii) Nursery Soil Health and Root Management. The tasks presented to the groups for discussion are outlined in the 'Overview: Breakout Session 2' box below.

Overview: Breakout Session 2

As was mentioned in the introductory presentation today, a key barrier to the success of research in the urban tree value-chain is the fragmentation among value-chain actors with respect to their engagement with the research process. This ultimately can reduce the effectiveness of implementation and the potential impact of the research findings on the sector. A key objective of this workshop is to advance from conversation to action. Your group will be assigned one of the identified research priorities. Your job during the breakout discussion is to define the implementation plan for the objective.

Task: Trace the research priority across the value-chain.

- What are the primary informational needs related to this research priority? Where do they exist on the value-chain?
- What have been the challenges and/barriers limiting these needs from being met?
- What does success look like for each of the actor groups in the value-chain?

Results

In order to better understand the commonalities of what is needed for a value-chain collaborative research approach, the informational needs, challenges and barriers and indicators of success as identified by the groups were summarized and sorted. Within each research priority area, we identified the overarching emergent **Objective** presented by the discussion groups. We then identified the **Outputs** needed and finally the purpose or **Application** of said outputs**.** Where participants identified informational needs that have already been addressed either in the scientific or technical literature, we note the need for improved access to information to support the dissemination of data and resources that are not lacking but are perhaps inaccessible to the value-chain. The results of this filtering exercise can be found in **Figure 6** (whereas the unfiltered discussion boards can be found in Appendix B).

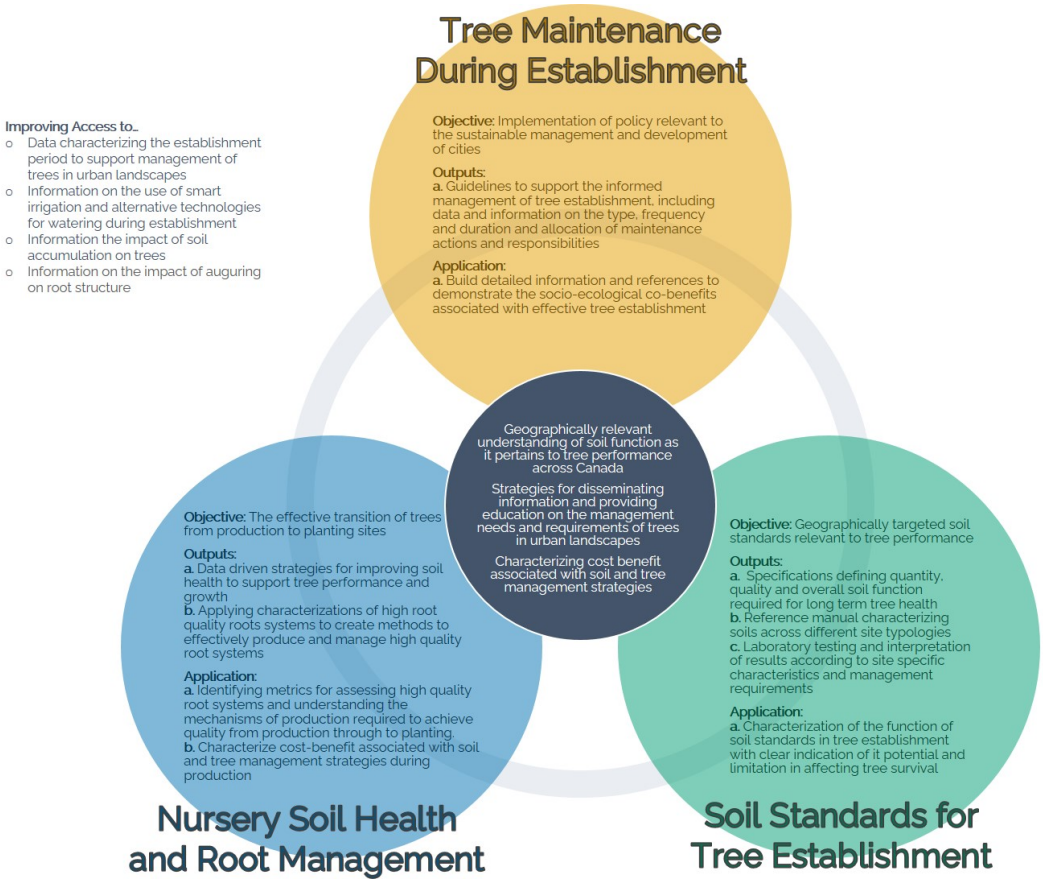


Figure 6 Diagram demonstrating the three priority areas with objectives, outputs and applications. The concepts that emerged as central to themes and as indicators of success appear in the centre overlapping the research themes in the figure. Outside of the radial Venn diagram are the other informational needs that emerged during the discussion.

Breakout Session 2 was centered on generating discussion on the top three research priority areas. In many instances, ideas from each of the categories (informational needs, challenges and barriers and success) were raised frequently and consistently across research priority themes. These ideas constitute shared and common interests relevant to the entire urban tree value-chain with respect to implementation planning.

The centre of the diagram therefore represents informational needs that were shared across all three research priority areas. These were also the ways that groups variously defined what "success" would look like for the value-chain if the objectives were achieved. "*Geographically relevant understanding of soil and tree performance"* was mentioned in both Breakout Sessions 1 and 2 as well as multiple times within and across individual group discussions. It appears to be a central indicator of success as defined by the workshop participants. "*Education* and *strategies for disseminating information"* was also central to many discussions in both breakout sessions and appears as another central idea underlying a successful value-chain research approach. Finally, "*characterizing cost-benefit"* and the value proposition associated with soils and trees, emerged multiple times in both sessions. It too appears as a central indicator of success according to workshop participants across all sectors.

Based on the information that emerged during Breakout Session 2, we identified the research questions that need to be addressed in order to achieve the objectives, outputs and applications that ultimately work towards those visions of success that were identified as central themes during the workshop.

Research Questions

1. What are the critically important best practices for managing trees in the landscape during the establishment phase?
2. What are the key soil properties, quantities and qualities that are required to support long-term tree health?
3. What level of soil health improves tree performance and growth and how can it be achieved?
4. What production methods and handling practices create persistent high quality root systems?

Summary

A recurring point made by many participants was the need to continue working in a collaborative fashion. Many participants pointed out how valuable the workshop discussions were and simultaneously noted how infrequently they had the chance to discuss topics with their colleagues across the value-chain. As the workshop ended, we polled the participants and asked if they would consider participating in a collaborative value-chain research model, such as the prospective Research Consortium. 96% of respondents answered favourably, indicating that they were interested in joining the proposed **Greening the Landscape Research Consortium**. Therefore, our intent, in addition to reporting on the workshop, is to move "from conversation to action." In the next section, we outline a proposal to advance the needs expressed by participants by launching a collaborative research model in the near term to allow us to tackle the priorities they identified together as a value-chain.

Contact

For more information on the project or next steps, please contact:

Darby McGrath
darby.mcgrath@vinelandresearch.com

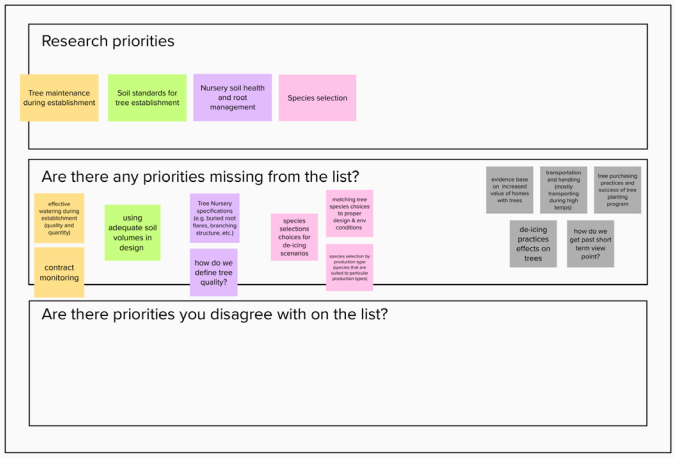
Appendix A – Workshop Participant List

Gerry Aubin	*Aubin Nurseries, MB*
Dan Vanderkruk	*AVK Nursery, ON*
Dave Braun	*Braun Nurseries, ON*
Deb Veccia	*Chatham-Kent , ON*
Chris Decaire	*Chatham-Kent , ON*
Steve Robinson	*City of Burlington, ON*
Timea Filer	*City of Guelph, ON*
Crispin Wood	*City of Halifax, NS*
Kevin Osmond	*City of Halifax, NS*
Heather Fraser	*City of Moncton, NB*
Ray Vendrig	*City of Toronto, ON*
Amory Ngan	*City of Toronto, ON*
Uyen Dias	*City of Toronto, ON*
Martha Barwinsky	*City of Winnipeg, MB*
Ron Koudys	*CLS, Landscape Architect, ON*
Jamie Aalbers	*CNLA , ON*
Mario Cramerstetter	*Cramer Nurseries, QC*
Gerard Fournier	*CUFN - Prairies, SK*
Anita Heuver	*Eagle Lake Nurseries, AB*
Stan Kochanoff	*Environova, NS*
Dave Sept	*Golden Spruce Nurseries, BC*
Christene LeVatte	*Highland Landscapes, NS*
John Blok	*Horizon Landscape Contractor, BC*
Glen Manning	*HTFC Planning & Design, MB*
Andrew Ronald	*Jeffries Nurseries, MB*
Jaime Douglass	*Jenkins Soil Mixtures , ON*
Samantha Mulholland	*Jenkins Soil Mixtures , ON*
Vic Krahn	*Lakeshore Tree Farms, SK*
Joel Beatson	*Landscape Alberta, AB*
Jan Loner	*Landscape Nova Scotia, NS*
Tony DiGiovanni	*Landscape Ontario , ON*
Jason Kropf	*Moser Landscape Group, ON*
Corey Burant	*Niagara Parks Commission, ON*
Case Vanderkruk	*NVK Nurseries, ON*
Mark Vanderkruk	*NVK Nurseries, ON*
Paul Ronan	*Ontario Parks Association, ON*
Dwayne Beck	*Parkland Nursery, AB*
Joe Klassen	*Purple Springs Nursery , BC*
Frank Burrows	*Saugeen Shores , ON*
Sandy Howkins	*Specimen Trees, BC*
Sharon Johnsen Howkins	*Specimen Trees, BC*
Jeremy Johnson	*Town of Caledon, ON*
Shannon McKay	*Town of Lincoln, ON*
Cody Brown	*Tree to Tree Nurseries, AB*
Alex Satel	*Urban Forest Innovations, ON*
Philip van Wassenaer	*Urban Forest Innovations, ON*
Erin Agro	*Walker Environmental, ON*
Nicole North	*Walker Environmental, ON*
Art Maat	*Wilco NW, AB*
James Lane	*York Region, ON*

Appendix B – Discussion Boards

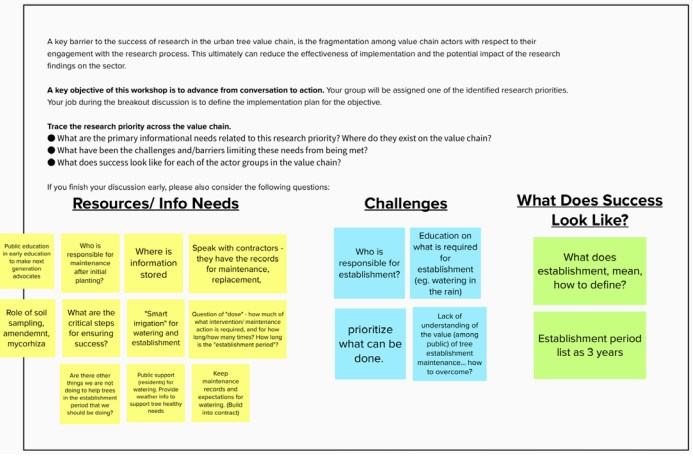
Breakout Discussion 1

Nursery Sector



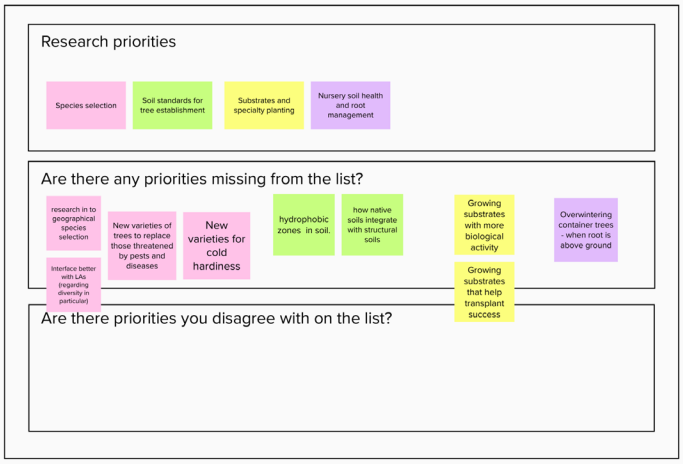
Breakout Discussion 2

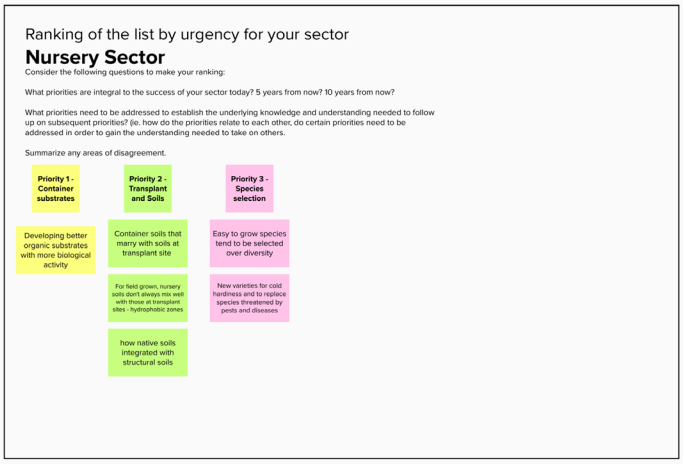
Research Priority: **Tree Maintenance During Establishment**



Breakout Discussion 1

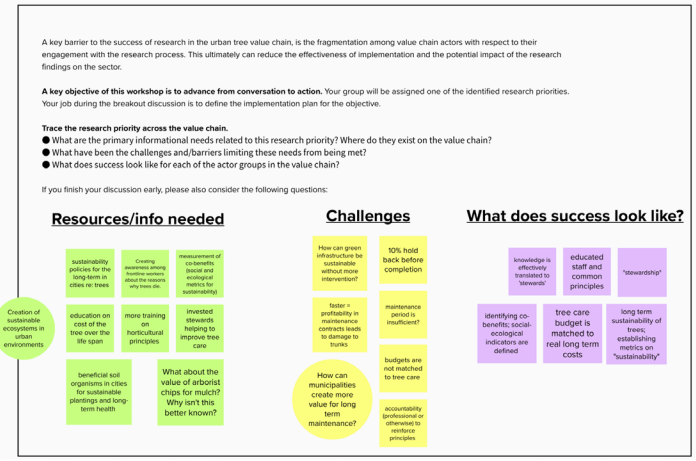
Nursery Sector





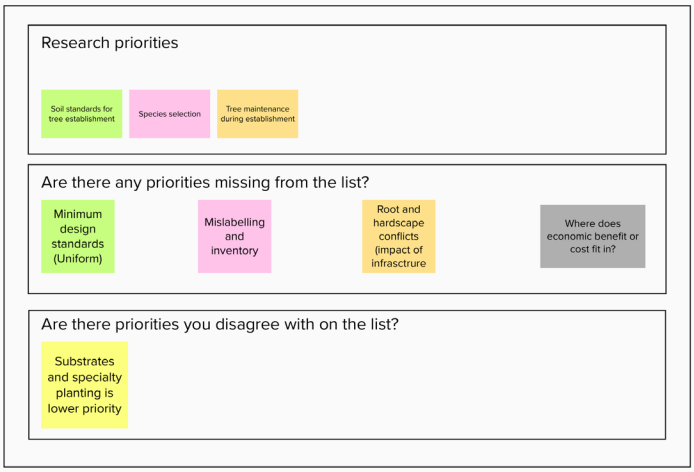
Breakout Discussion 2

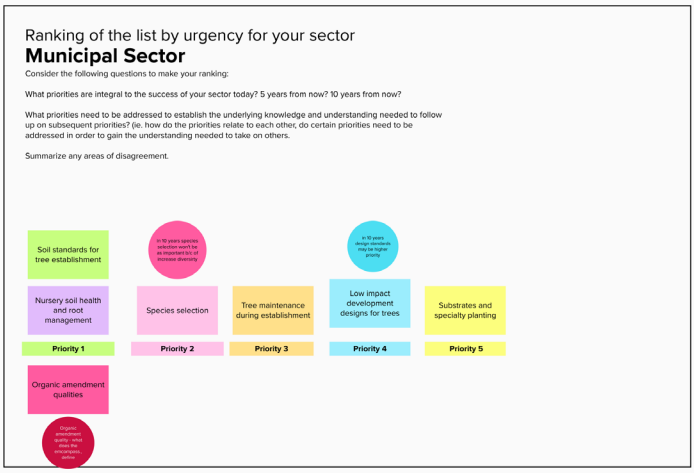
Research Priority: **Tree Maintenance During Establishment**



Breakout Discussion 1

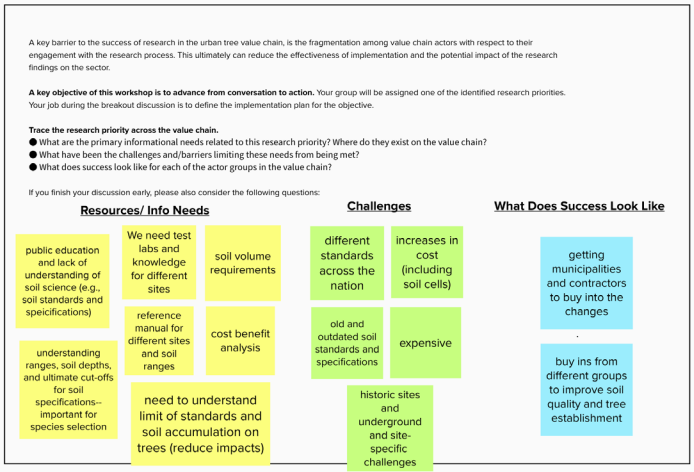
Municipal Sector





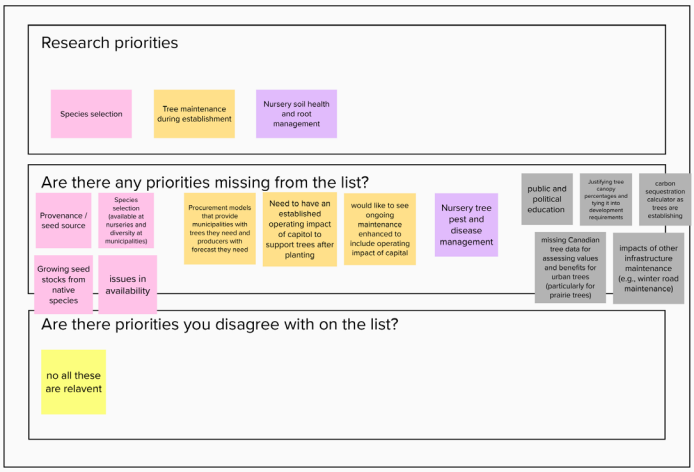
Breakout Discussion 2

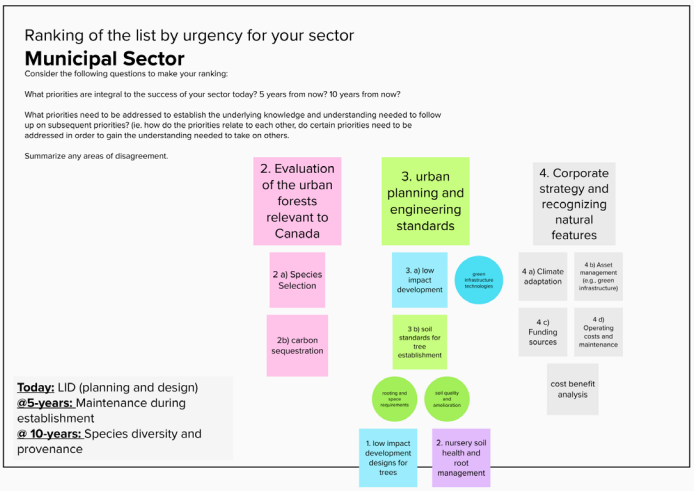
Research Priority: **Soil Standards for Tree Establishment**



Breakout Discussion 1

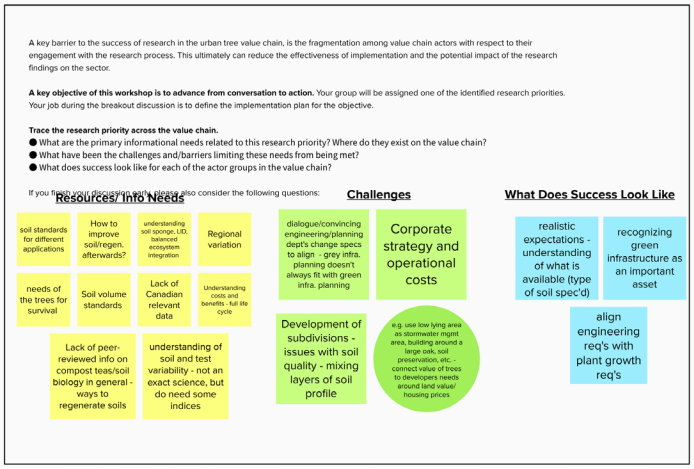
Municipal Sector





Breakout Discussion 2

Research Priority: **Soil Standards for Tree Establishment**

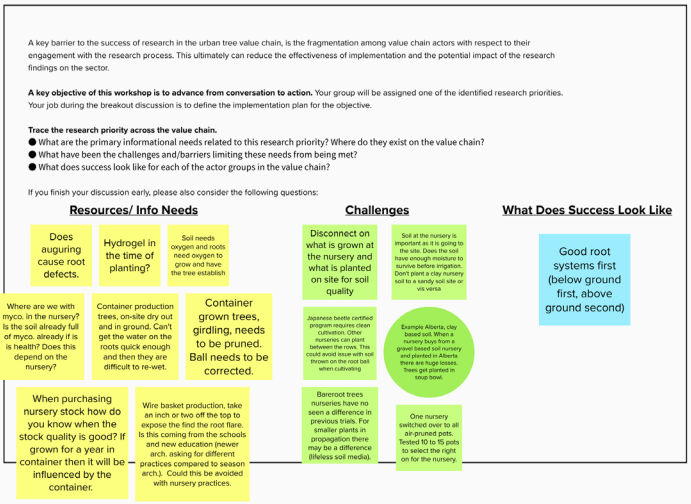


Breakout Discussion 1

Municipal Sector

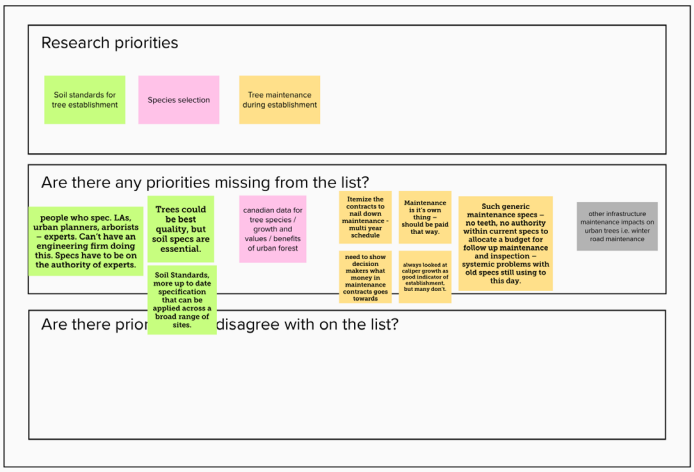
Breakout Discussion 2

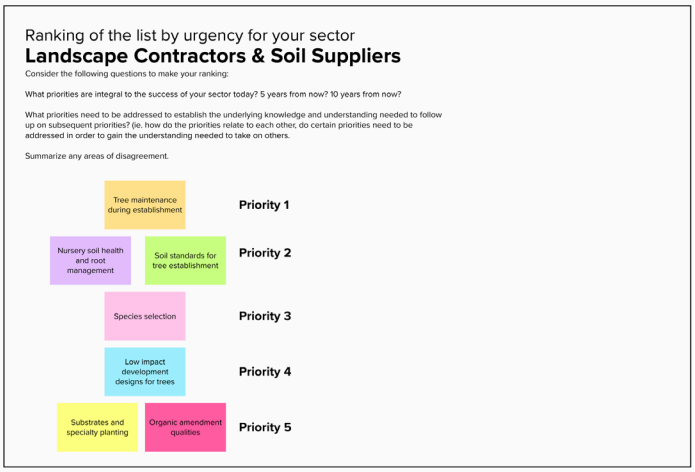
Research Priority: **Nursery Soil Health and Root Management**



Breakout Discussion 1

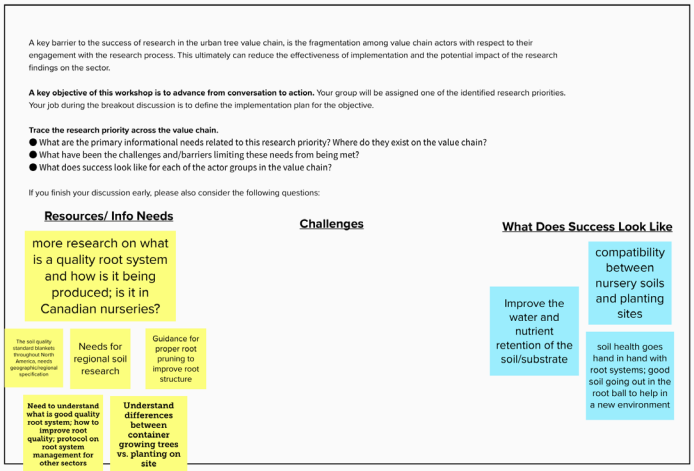
Landscape Contractors & Soil Suppliers





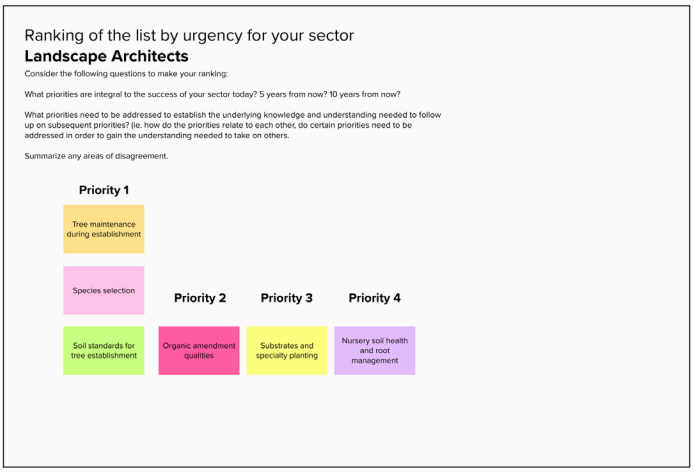
Breakout Discussion 2

Research Priority: **Nursery Soil Health and Root Management**



Breakout Discussion 1

Landscape Architects



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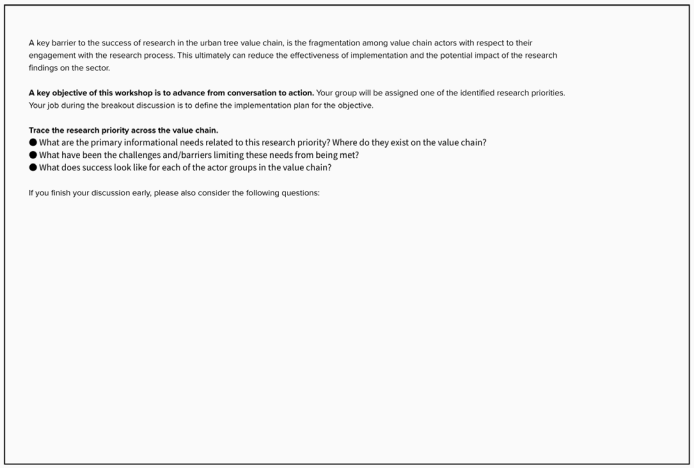

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