



**AgriInnovation Program Stream B**

**2017-18 Annual Performance Report**

**Plant Atlantic - development and marketing of new hardy woody plant varieties based primarily on native Newfoundland flora**

Name of Recipient: Canadian Ornamental Horticulture Alliance	
Project Title: Canadian Ornamental Horticulture Research and Innovation Cluster	
Project Number: AIP-CL20	Period Covered by Report: 2017-04-01 to 2017-12-31
Activity #: COHA 09 Name of Activity: Plant Atlantic - development and marketing of new hardy woody plant varieties based primarily on native Newfoundland flora	Principal Investigator: Todd Boland

**1. Performance Measures.** See Annex A for an explanation of each measure.

Innovation Items	Results Achieved	Provide a description (2-3 paragraphs) for each item produced and describe its importance to the target group or sector. Explain any variance between results achieved and targets. Use plain language.
# of new varieties	1	<p>Our successful new plant release that is currently undergoing commercialization is a native <i>Salix candida</i> selection which will be trademarked under the name 'Iceberg Alley' and released through the <b>Northern Gardens Introductions</b> program from Jeffries Nurseries in Manitoba. This past December an agreement was signed between Memorial University and Jeffries Nurseries, allowing Jeffries to undertake the trademarking and commercialization of the willow. Application for trademarking is forthcoming.</p> <p>'Iceberg Alley' willow is unique in the landscape trade as it is a hardy (zone 2) medium-sized shrub (1.2-2 m) with 4-8 cm long, felted silver-white foliage. Until now, a woody plant with these characteristics was unknown in the Canadian landscape. This new plant release will fill an empty gap in the landscape and provide excellent contrast in any landscape design. This shrub, with its inherent salt and wind tolerance, will be useful for both commercial, residential and municipal landscapes.</p> <p>Our target was the commercial release of three new ornamental woody plants onto the Canadian landscape scene. While we did not meet this target, we do have four more woody plants which have potential to become commercialized. The reason for only one being released for commercialization, rather than the target of three, was due to time constraints. The three year duration of this project was too short a time frame for the proper evaluation of woody plants, especially trees. Although one was accepted for commercialization, an additional four received high rankings</p>



Innovation Items	Results Achieved	Provide a description (2-3 paragraphs) for each item produced and describe its importance to the target group or sector. Explain any variance between results achieved and targets. Use plain language.
		for desirability as new landscape plants, but were not deemed mature enough for a full evaluation. The trialing nurseries, who think highly of these four plants, requested more time to allow the plants to fully mature before making a commitment for their commercialization.

Information Items	Results Achieved	Provide the complete citation for each item. Please see Annex A for examples.
# of information items	1	An announcement of the commercialization of our <i>Salix candida</i> 97-1 aka 'Iceberg Alley' Willow, was made in Jeffries Nurseries newsletter <b>Growing Matters</b> , December 2017, Volume 20, Issue 4, page 2. The title of the article was " <b>Iceberg Alley Dwarf Willow</b> ". Besides being posted on their website, this newsletter is also directly sent to 325 industry members and companies. The following is a link to their newsletter. The article is located on page 2. <a href="http://www.jeffriesnurseries.com/December%202017.pdf">http://www.jeffriesnurseries.com/December%202017.pdf</a>
# of media reports	1	Press release provided by Memorial University announcing the partnership between the University and Jeffries Nurseries for the commercialization of our 'Iceberg Alley' willow. This was released on December 21, 2017. The press release was entitled " <b>Memorial University of Newfoundland and Labrador (MUN) - Botanical Garden Discovery Takes Root</b> ". It was written by Rebecca Coho from the communications department at the Memorial University. The interviewee quoted in the release was Todd Boland.
# of information events	1	Horteast, Moncton, New Brunswick, November 29-30, 2018
		<b>Provide the # of attendees</b>
# of individuals attending information events		<b>230</b>
		<b>Provide the # of attendees who intended to adopt new information or technology</b>
# of individuals attending information event who intend to adopt new innovation		Approximately <b>75</b> . This horticultural conference also included companies selling hard-landscape products and equipment. Approximately 75 individuals were directly involved in the plant production/selling side of the landscape industry.
		<b>Provide the name, degree completed and date of completion</b>



## 2. Executive Summary

**Key Highlights** - This section describes the key activities and final scientific results of an activity/ project in such a way that readers can rapidly become acquainted with a large body of material without having to read it all. Include a brief statement of the problem(s), background information, concise analysis and main conclusions

Currently there is little active breeding and plant selecting within Canada for new horticulturally valuable plant material suitable for the landscape industry. This is especially true for new plant varieties based on native Canadian species. Today, there is more demand by landscape designers to use native plants in the landscape as such plants are often better adapted to local growing conditions. The use of improper non-native plants in a landscape design, whether by an individual home-owner, commercial enterprise or a municipality, can lead to expensive losses as plants perform poorly. Landscape plants derived from native species often perform much better and therefore are more cost efficient.

The purpose of this project was to introduce Nine new woody plant selections, developed in Newfoundland, to seven of Canada's largest commercial plant propagating nurseries. Unrooted cuttings/scions of the trial plants were supplied to the trialing nurseries at the time of the year dictated by the nursery. These nurseries would then propagate, grow and evaluate the plants to ascertain if any would be suitable to add to the current palette of plants used by landscapers. The trialed plants were rated on their ability to root/graft, foliage appearance, flower production (if applicable), susceptibility to pests and diseases and overall plant habit. Most importantly, these trialers had the opportunity to make critical reviews of the plant as to whether they would be a valuable and profitable addition to the landscape industry.

Three years, the length of time for this project, is a short time frame for the proper evaluation of a woody plant, i.e. a shrub or tree. Three of the nine trial plants failed to propagate. With this impediment to commercial propagation, they are unlikely to ever be commercially viable. Five trial plants have been given high evaluations by the trialing nurseries, indicating that they have the potential to be added as new ornamental plants to the Canadian landscape industry.

The one trial plant that proved itself during the three years of this project was our silver-leaved willow selection, *Salix candida* 97-1. This rapidly-growing shrub will reach 1.2-2 m with woolly, silvery-white foliage and has proven hardy across Canada. It will make an excellent landscape plant, and with its unique foliage, it will provide a strong accent in the landscape. This willow is now undergoing the first stages of commercialization. Memorial University and Jeffries Nurseries in Manitoba signed an agreement in November 2017 allowing Jeffries to commercialize the willow on behalf of Memorial University. The willow will be known as the trademarked name 'Iceberg Alley' and introduced to Canada through their **Northern Gardens Introduction** program. Through Jeffries, our willow was introduced to Bailey Nurseries in Minnesota, USA. They trialed the willow and were equally impressed with its performance and have now declared they will commercialize the willow in the United States through their **First Editions** program. Bailey's is now in the process of trademarking the name 'Iceberg Alley' in the USA.

Based on early trial results, our remaining four trial plants have all be tentatively accepted by the trialing nurseries but they require more time for a full evaluation. Byland Nursery in BC have been impressed with



the trialing results of our bog rosemary (*Andromeda polifolia* 07-1) and an upright, shrubby cotoneaster (*Cotoneaster franchetii* 08-1). The bog rosemary was selected for its ability to survive under relatively dry soil conditions. It is a low 30 cm plant with blue-tinted summer foliage, purple-tinted winter foliage and pale pink flowers in May and June. The cotoneaster will form a medium-sized shrub to 1.5 m with fine, silver-green foliage and red berries that remain on the plant through most of the winter. Byland's have indicated they will continue to trial these two plants for another season or two before making any commercialization commitments. Byland Nurseries introduced the bog rosemary to Bailey Nursery's Washington State outlet where they are currently also trialing it as another possible plant to be introduced in the US through their **First Editions** program.

The only trialing nursery to have success with our golden-foliaged spruce (*Picea abies* 'The Limey') and our creeping larch (*Larix laricina* 'Anaconda') was Cornhill Nursery in New Brunswick. They are conifer specialists and have the required expertise to propagate these two conifers via grafting. Unlike the *Salix*, *Andromeda* and *Cotoneaster* noted above, the spruce and larch are trees rather than shrubs. They require much longer trial times to properly assess their suitability as a new landscape plant. However, Cornhill have thus far been impressed with the spruce and larch and are willing to continue trialing these plants for the foreseeable future.

From our field trips looking for unique native plants with horticultural value, we obtained seven plants that we are currently trialing at the botanical garden; two willows, three iris, a creeping juniper and a lady's-mantle.

### Success Story -

The acceptance and signing of contract between Memorial University and Jeffries Nurseries for the commercialization of *Salix candida* 97-1, aka 'Iceberg Alley' willow, within the three year period of this project, was unexpected. We thought this willow had great potential as a new ornamental shrub to release across Canada but realistically we thought it would still be in the trialing stage at the end of the project. Through Jeffries' propagation of the willow and its sublicensing propagation to other nurseries in other parts of Canada, the willow is expected to be available to the public by 2020. That is quite a fast turnaround for a shrub.

Related to this was the totally unexpected exposure of this willow to Bailey Nursery, one of the largest plant propagators in the USA. Not only was Bailey's also impressed with the performance of the willow, but they too are accepting it for commercialization, with release through their very successful and well known branding **First Editions** program. So the willow selected by the MUN Botanical Garden will not only influence the landscape industry in Canada, but also of the northern USA.

### 3. Objectives/Outcomes (technical language is acceptable for this section)

**Introduction:** Current trends in the North American landscape industry call for the increased use of native



plants with low maintenance requirements. Presently, there is a limited availability of new novel hardy plants based on the native Canadian flora, resulting in a shortfall of product to meet the trend in native plant use. Plant Atlantic, the breeding program of the Memorial University Botanical Garden, was started in 2004 for the research and commercial development of new and under-used ornamental plants for Atlantic Canada's horticulture industry. This led to the development of the international commercially successful *Philadelphus 'Starbright'*, and has also resulted in the generation of several new Canadian-bred and native selection plants.

**Objectives:** The goal of the proposed work is to expand on Plant Atlantic's foundationally successful commercial plant breeding program, to increase the capacity of new plant introductions through continued breeding and selection with particular focus on the development of new hardy woody plant varieties, and to commercialize new plant varieties in Canada. This work is expected to contribute to the success of the Canadian horticultural industry through the commercialization of new plant selections that satisfy the demand of the market for native "home-grown" plants. It will also diversify plant selections available from Canadian growers, which can then serve markets in Canada.

**Methodology:** The Memorial University of Newfoundland Botanical Garden (MUNBG) selected nine woody plants (trees and shrubs) that were growing in our collection that had potential as a new landscape plant release for the Canadian Nursery and Landscape Association. Seven of the nine species were Newfoundland natives. These included selections of *Andromeda polifolia*, *Juniperus communis*, *Kalmia polifolia*, *Larix laricina*, *Picea glauca*, *Salix calcicola* and *Salix candida*. The two non-native species were selections of *Cotoneaster franchetii* and *Picea abies*.

MUNBG then contacted the main commercial plant propagators across Canada to ascertain if they would be willing to trial the plants for the three years of the project. Each nursery was provided a booklet describing the nine plants along with photos to illustrate the plants appearance in the landscape. The nurseries who agreed to be trialing stations included Corn Hill Nursery (NB), Quebec Multiplants (PQ), Sheridan Nurseries (ON), JC Bakker and Sons (ON), Jeffries Nurseries (MN), Lakeshore Tree Farms (SK) and Byland Nursery (BC). Based on the booklet information and the suitability of each plant for the nursery's particular growing conditions, each trialing nursery sent their request for which plants they would like to trial. Throughout the growing season of 2015 and 2016 cuttings/scions of the trial plants were sent to the trialing nurseries. At the end of each growing season, the nurseries would rank the plants' ability to root/graft, foliage appearance, flower production (if applicable), susceptibility to pests and diseases and overall plant habit. Most importantly, these trialers, as the industry experts, could make critical reviews of the plant as to whether they would be a valuable and profitable addition to the Canadian landscape industry.

To expand potential new native plant offerings, we did a plant collection trip to various parts of Newfoundland each year.

**Deliverables:** At the end of this project we expected three of the nine plants to be selected as new varieties suitable for commercialization.

**Results:** Several of the trial plants being tested were never successfully propagated by the trialing nurseries. These included *Juniperus communis*, *Kalmia polifolia* and *Picea glauca*. *Salix candida* was successfully rooted at all locations although two locations were not successful in rooting the *Salix* until their second



year. All nurseries gave consistently high rankings to the willow with Jeffries Nurseries being the first to approach MUNBG about the commercialization of the plant. Jeffries introduced the willow to Bailey Nurseries in the USA who also tested the plant and deemed it suitable for commercialization in the USA through their nursery. *Salix calcicola* was rooted at Bylands, Sheridans and Quebec Multiplants but plants did not perform well under their high summer temperatures. It succumbed to both fungal diseases and mite infestations. *Cotoneaster franchetii* was only rooted and tested at Bylands. Thus far they have given it high rankings. *Andromeda polifolia* was not successfully rooted by any of the trialing nurseries but Phytoclone Inc. in Quebec were very successful in tissue culturing the *Andromeda*. Plants were then sent to Bylands for testing and they gave the plants high ranking and shared the plant with Bailey Nurseries in the USA who are now also testing the plant. *Picea abies* and *Larix laricina* are conifers which are propagated by grafting. As Bylands and Corn Hill were the only nurseries that had experience with this method of propagation, they were the only nurseries to accept these plants for trialing purposes. Bylands was not successful in grafting either plant however Corn Hill was and thus far, have given both high rankings for desirability.

From our plant collection trips across Newfoundland we obtained seven unique, potentially valuable native plant selections including *Salix planifolia*, a narrow-leaf form of *Salix candida*, a compact form of *Juniperus horizontalis*, a compact form of *Alchemilla filicaulis*, a striped-flower form of *Iris versicolor* and two unique colour forms of *Iris hookeri*. These are now undergoing trials at our botanical garden.

**Discussion:** For many years MUNBG has been breeding or selecting new ornamental plants from both native flora as well as non-native exotic species. Visitors to the botanical garden have commented on many of these, providing positive feedback and enquiring where the plants might be purchased. While these plants were attractive to local gardeners and the plants in question grew well in Newfoundland, we had no idea if the plants might have broader appeal across Canada. MUNBG is not in the position to propagate and commercialize these plants ourselves: we require commercial plant propagators elsewhere in Canada to take over this role. Hence the driving force behind this project.

MUNBG decided to send unrooted material to the trialing nurseries which, in hind-site, was probably not the best way to have the plants trialed. If sent rooted material from the start, there would probably have been an increased chance that the plants would have grown, allowing for their evaluations. However, as the trial nurseries are commercial propagators we thought they should have the experience of trialing the plants right from the first stage of production which is indeed, rooting of the plant material. It was unfortunate that since several of the plants were reticent to root, they could not be properly evaluated for their potential as a new ornamental plant release. Some nurseries were not successful in rooting the trial plants until year two of the three year project, so they had limited time to properly evaluate them. While some of the trial plants failed to root altogether, several of the trialing stations are still keen on obtaining more plant material for testing.

MUNBG was successful in getting one of the trial plants, *Salix candida*, accepted for commercialization in both Canada and, unexpectedly, the USA. While we aimed for three Canadian commercial plant releases, the time frame of the project was not sufficient enough to allow for the full evaluation of many of the plants. However, based on their positive rankings, four other trial plants – *Andromeda polifolia*, *Cotoneaster franchetii*, *Larix laricina* and *Picea abies*, have been shown to possess commercial potential. We are hopeful that with a longer trialing period they will indeed be accepted as new ornamental plant releases.



The fact that the trialing nurseries are still willing to carry out trials for us, beyond the scope of this project, is very encouraging. This proves that the Canadian landscape industry is keen, and there is a demand for, obtaining new plant cultivars based on both Canadian native species as well as other non-native species. Currently there is little plant breeding or selecting occurring in Canada; the USA and Europe are the leading regions developing new plants for the landscape industry in Canada. However, Canada has a huge potential for developing new plant cultivars and this project shows that this demand exists. Hopefully the success of this project will encourage more independent Canadian plant breeders to come to the forefront.

#### **4. Issues**

The main issue of this project was the rootability/grafting of the plant material being sent to the trialing nurseries. Of the nine selections sent, some propagated easily for some nurseries yet were difficult for others. Meanwhile three of the selections would not propagate at all. Plant material was sent to the nurseries over two years of the project to overcome their propagation failures in the first year of the project. Three of the selections could only be propagated by grafting, a technique not used by many of the trialing nurseries therefore reducing the scope of their evaluation. All this resulted in some inconsistencies in the plant evaluations as some nurseries had the plants for a longer trial period than others. However, despite this issue, the trialing nurseries are still interested in continuing the evaluation of our plant selection beyond the end time of this project.

The only change to the work plan was that in the original work plan, we were to attend the Horteast Landscape Conference to share our project in 2016 but it was decided that 2017, the final year of the project, would be a more appropriate timing to attend the conference. This did not change the overall budget.

#### **5. Lessons Learned:**

The lesson learned from this project was that in the future, any new plant selections we wished trialed from MUNBG should be sent to the trialing nurseries as already rooted/grafted plants. This would allow more consistent evaluation across Canada as all trial stations would start at the same stage and time-line in their evaluations.

#### **6. Future Related Opportunities:**

One of the main positive aspects of this project was developing a rapport with commercial plant propagators across Canada. MUNBG now has several conduits across Canada where we could have our



newly developed or selected plant varieties evaluated.

While only one of our trial plants was accepted for commercialization at the end of this project, four others may well become commercialized once they have had a longer period of evaluation. Jeffries Nurseries has already approached us with an interest to trial additional plants from Newfoundland. In particular, they are looking for additional selections of the *Salix candida* they are now commercializing on our behalf. Together, we are now looking into avenues that could assist in funding a plant exploration of northern Newfoundland with the specific goal of searching for new selections of *Salix candida* to release under the 'Iceberg' series.

While this project was the trialing of woody plants, MUNBG also has several herbaceous perennial plants that may have commercial potential. However, it is a slow process to propagate enough testing material of perennials to fulfil the requirements for trialing nurseries. The best way to ramp up the numbers of perennials would be by tissue culture. As a result of the success of this project, MUNBG has been encouraged to invest in a tissue-culture lab to allow us to properly trial perennials across Canada.

We would expect more plants trials, based on plants from MUNBG, to continue into the foreseeable future.

**NOTE TO READER: This report has been edited from the original for formatting purposes only. There have been no changes made to the information provided by the researcher.**