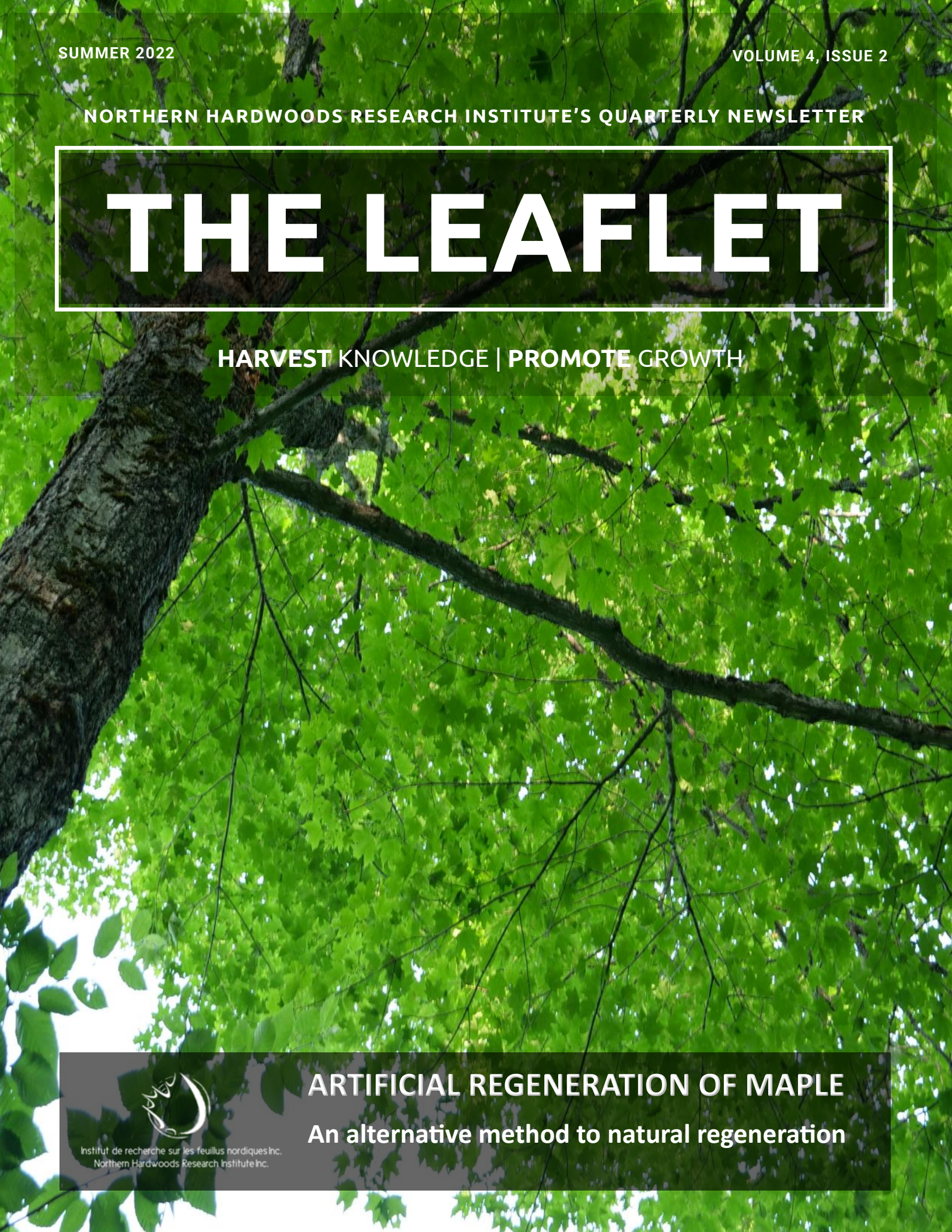
SUMMER 2022

VOLUME 4, ISSUE 2

NORTHERN HARDWOODS RESEARCH INSTITUTE'S QUARTERLY NEWSLETTER

THE LEAFLET

HARVEST KNOWLEDGE | **PROMOTE** GROWTH



Institut de recherche sur les feuillus nordiques Inc.
Northern Hardwoods Research Institute Inc.

ARTIFICIAL REGENERATION OF MAPLE

An alternative method to natural regeneration

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FORWORD

WELCOME TO THE SUMMER EDITION OF THE LEAFLET

Pierre Lagacé, Field Forester | Northern Hardwoods Research Institute

Hello,

Get out the sunscreen and your insect repellent, because the hot summer sun and the mosquitoes are out, along with the 2022 summer edition of The Leaflet!

Without hesitation, for me, summer is one of the best seasons to work in forestry. This season is very special because the arrival of the summer marks the beginning of a new adventure just around the corner. Many of my fondest memories in forestry comes from the time I had worked in Western Canada. It was during this season that I met many new people who came from all over Canada and the world with a common goal; to go on an adventure and explore the world of forestry. For 15 years, I have been working in the field of forestry and the pleasure of being in the forest during the summer is renewed year after year. The summer of 2022 will be no exception especially since last June, I started my career with NHRI as a forester and I look forward to meeting new people and experiencing new adventures.

I invite you to read the Leaflet to stay informed of the work and research projects carried out at NHRI. I hope that like myself, you will anticipate the pleasure of this season and I wish you an excellent summer.

Pierre Lagacé
Field Forester

the

ARTIFICIAL REGENERATION OF MAPLE

AN ALTERNATIVE METHOD TO NATURAL REGENERATION

by Storm Robinson

Storm Robinson has developed a unique expertise on the frost tolerance of trees. Through her master's degree, she is studying how different provenances of red spruce varied in the process of frost acclimatization and how these variances explain the differences in growth between trees. Storm directs work related to practices that make our sugar maple resistant to a changing climate and research about the artificial regeneration of maple.

The preferred method of regeneration for maple species is to promote natural regeneration. On an operational scale, it is uncommon to recommend artificial regeneration of hardwood species because of the cost, the likelihood of animal browsing, and the growing conditions left behind by harvesting. Therefore, costs associated with the artificial regeneration of hardwood species can be 3-5 times those for softwood species. The Northern Hardwoods Research Institute has developed methods and techniques to promote natural regeneration through harvest-based silviculture that are at the foundation of its Silviculture Prescription System (SPS).

Nevertheless, there is still interest in artificially seeding and planting hardwoods and there are still more questions than answers, especially in our region.

Our partners at AV group have requested us to explore the potential for growing maple artificially. Working with the New Brunswick Department of Natural Resources and Energy Development (NB DNRED), and with help from the National Tree Seed Centre (NTSC) at the Atlantic Forestry Centre, we have officially started our Artificial Regeneration of Maple (ARM) project with AV Group. Our aim is to explore the best ways to grow maple to an operational capacity, including collecting seed, direct seeding versus planting, choosing the correct container size, and the best methods and season to plant seeds or seedlings.

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by Storm Robinson

The NTSC possesses very knowledgeable seed biologists and the best guidebooks to inform best practices on seed collection, storage, and germination. NB DNRED is hosting container trials and helping to build best management practices for growing maple seedlings at the Kingsclear Tree Nursery in Fredericton, NB. With their advice and hands-on experience, best practices are being produced for the collection, storage, seeding, and container growth of red, sugar, and silver maple seeds, as each species has unique qualities and issues. This project is currently between the design phase and the operations phase as we move quickly to get seed in the ground.

Collection and storage of maple samaras

There are many factors that affect seed production in hardwoods; the age of the tree, masting frequency, crown size and position, and stresses such as pests, insects, drought and poor nutrients. Red and silver maple tend to have a bumper crop every 1-2 years, whereas sugar maple only sees a bumper crop every 3-7 years. With the stresses of climate change, seed collectors are concerned for maple seed supply, especially for sugar maple, and for silver maple because of its recalcitrant seed (it will not survive being dried out or frozen). Red and silver maple samaras begin to develop on the tree in spring in early May, and sugar maple samaras begin developing in early September. This is a good time to forecast embryo production. This is done by scouting locations and performing seed cut testing on the samaras (Figure 1). Seed cut testing is exactly as it sounds, where a sample of samaras is collected from various locations on the tree (different aspects and canopy height) using a pole pruner. A healthy developing embryo will show a clear green folded embryo inside the seed coat, and the embryo will fill more space inside the seed coat as it reaches toward maturity (Figure 2). Ensure the seed is ripe before collecting it as collecting too early will result in seed that is not completely mature and collecting too late will result in natural seed fall. The samaras will change colour as they mature from green to reddish green/tan. Inspect the tree at each forecast and collection date for insect damage or decay. If seed quality is low, choose another tree.

Figure 1 - Unripe red maple samaras during seed cut testing.

Seeds should be collected from natural stands, not planted or street trees. The origin of urban tree seeds is usually unknown and may be imported from other regions. Seeds from other seed zones may not be adapted to local growing conditions. Look for large young trees greater than 20 cm in diameter with primarily male flowers. For most species, excess moisture should be reduced to a relative humidity of 20 – 40%.

This can be done by collecting in paper bags and spreading the samaras thin on a large surface (Figure 3). The exception to this is for silver maple, whose seed moisture must be maintained above 43%.

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Figure 2 - Side view of red maple seed cut test at different stages of maturity. The seed on the left was tested during the initial weeks within the potential collection period and the seed on the right was tested right before collection. Mature seed can be seen with little to no space between the embryo and the seed coat (NB DNRED, 2022).

Figure 3 - Silver maple samaras spread out to surface dry before refrigeration (Robinson, S. 2022).

Only surface moisture should be removed, and mechanical dewinging should not be attempted. Store these recalcitrant seeds in plastic bags in a cooler or fridge (1 – 4°C) before sowing. Some studies have shown storage at -3°C is possible but seeds would be less viable or vigorous than freshly sown seed (Tylkowski, 1984). Samaras containing seed can be readily separated from empty samaras by immersion in N-pentane. Immersion up to 1 hour may delay germination but has no effect on seed viability. To germinate, sugar maple seeds require moist stratification at temperatures slightly above freezing for 90 – 120 days. Under proper conditions seeds have been stored for at least 5 years without loss of viability. The optimum temperature for germination is about 1° C (34° F), the lowest of any known forest species. Germination drops rapidly as temperature increases, and little if any germination occurs above 10° C. Planting of red maple requires a lower stratification of 54 days, which may not be necessary depending on time of year or growing conditions. A pre-stratification soak is recommended for both species. Silver maple does not require any stratification since it cannot be stored at freezing temperatures and should germinate well at room temperature if seeds are placed in a clear plastic bag and spread out 3-4 seeds thin.

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A review of direct seeding versus planting of maple trees

Establishing hardwood trees by sowing seed is a relatively new method that has several advantages over traditional planting of seedlings. Direct seeding establishes thousands of seedlings per hectare rather than hundreds with traditional planting. Trees reach "crown closure" and begin shading out vegetative competition earlier. Follow-up weed control typically only needs to be done for two years after seeding, instead of eight to 12 years with planting. Greater density of seedlings forces trees to grow straighter due to side competition from nearby stems resulting in higher quality timber. Competition decreases pruning needs and produces higher quality hardwood saw logs. Trees grown from seed best suited to a particular site are likely to dominate because of density. Small variances in site conditions aren't planned for when planting seedlings and with direct seeding, the seeds best suited to the site will outcompete less vigorous or suitable seeds. Direct seeding is also a much closer approximation of mother nature's hardwood establishment method than seedling planting in rows, resulting in a more natural stand appearance. Finally, animals such as deer, while still causing damage by browsing, will be less likely to devastate a direct seeding than a traditional seedling plantation due to far greater stems per hectare.

There are some issues to consider with direct seeding as well. Establishing seeds may be somewhat costlier than planting seedlings because of the density required (~3000 seeds per hectare versus ~1000 trees per hectare) but this cost can often be offset by collecting some seed yourself or doing your own site preparation. Follow-up care costs will be compressed into the first two to three years, but should be less than with seedling planting, due to earlier crown closure. Inconsistent seed availability, seed supply issues (i.e., sugar maple), and rodent issues lead to some hesitation at using most of the seed supply on direct seeding rather than carefully planned container establishment in a greenhouse. In forest sites, it is recommended to conduct intensive site preparation such as with disk trenchers.

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by Storm Robinson

Prior to mechanical scarification, it is recommended to also conduct some chemical site preparation. Seeding in open conditions with sugar maple have a high survival rate, but seedlings grow poorly because of their inability to compete for moisture and nutrients with herbaceous vegetation. Generally, open field plantings require good stock and several years of vegetation control to assure success. Time of planting is also important. Survival and growth can be vastly improved by planting very early in the spring compared to planting late in the spring. The increase is attributed to the greater root regeneration capabilities during that time. Sugar maple must be planted at relatively close spacings to correct the forking problems that result from the frequent loss of the terminal bud in this opposite-branched species. Controlling grass and weed competition until seedlings reach crown closure (which often happens in about 3-4 years) is crucial to the success of any seeding project. If weeds are not controlled, tree seedlings will be outcompeted for moisture and sunlight. Treatment options for both planting and direct seeding will be part of our ARM trials.

Artificial regeneration of maple (ARM) trials

The 2021 red and sugar maple stock were produced from 300 seeds from the NTSC in a container trial performed by NB DNRED. All seeds were separated into six different trials that would differ in stratification and

Figure 4 - Indoor peatmoss (Left), Indoor cotton (Middle), and outdoor peatmoss (Right) stratification methods containing sugar maple seed (NB DNRED, 2021).

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by Storm Robinson

germination growing conditions. The only difference in procedure between red and sugar maple was the stratification period. Two indoor germination trays were lined with wet peatmoss while another two were lined with a wet cotton sheet, and two outdoor trays were lined with the same peatmoss (Figure 4).

Indoor trays were placed in refrigerators kept at 4 °C for duration of their stratification. Outdoor trays were placed in the cone shelter outside the Atlantic seed center at the beginning of January. During the first week of May, one tray from each of the three stratification methods was transplanted into multi pot trays and one in raised air pruning beds, creating six different trials. In mid-late summer, all multi pot trees were transplanted into 6 by 6-inch square containers and then relocated to an outdoor shade area. At the end of the summer, all trees planted in raised beds were also transplanted into 6 by 6-inch containers and placed in the same outdoor shade area. The results of these trials are still to be determined, but in general the biggest contributing factor to the size and survival of the seedlings was the container size, and the June 2022 survival count was 299 red maple and 131 sugar maple (Figure 5 & Figure 6).

Figure 5 - Red and sugar maple NB DNRED container trials from 2021 to be used in the ARM project taken May 19, 2021 (Robinson, 2022).

Figure 6 – 1–2-year-old red and sugar maple seedlings from NB DNRED 2021 container trials to be used in the ARM project, photo taken July 8, 2022 (Robinson, S).

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by Storm Robinson

In 2022, NB DNRED acquired approximately 315 red and sugar maple germinates from the NTSC, avoiding the need to stratify and germinate seedlings. 300 of each species were transplanted in early May into Canam multi pot trays filled with a mixture of peatmoss and vermiculite (3:1). Once transplanted, all 300 of each species were placed in the greenhouse. Once mid-summer 2022 arrives, these trees will then be relocated outside to harden off or will be planted directly by AV group at our demonstration sites (Figure 7).

Figure 7 – 0–1-year-old 2022 stock with sugar maple on the left and red maple on the right. Photos taken July 8, 2022 (Robinson, S).

2022 Silver Maple Collection and Seedlings

Shortly after seed cut testing, NHRI realized we were short on time to collect and plant some silver maple samaras. This became increasingly important as we learned they could not be stored, and as we learned that no plans for their growth had been set with Kingsclear nursery. NHRI decided we needed to act quickly and organize a silver maple collection. Our field technicians managed to collect ~ 90 litres of seeds from Edmundston while NB DNRED collected ~ 55 litres from the St John River floodplains / Jemseg area. Many seeds were lost to mold and improper storage due to lack of experience. Even after warnings of rapid germination from NTSC, approximately a third of the Edmundston seedlot began to germinate during their trip back to Fredericton. Acting quickly with Kingsclear Tree Nursery, we were able to rescue 300 germinates that we were not prepared for (Figure 8). The silver maple germinates were sown on June 17 and have shown exciting growth in just three weeks (Figure 9). The remaining silver maple seeds (5000) are to be sown by NB DNRED in the week of July 11, 2022. Red and sugar maple seeds will be stratified and ready to be sown in March of 2023. A long-term experimental design for the artificial regeneration of maple project is in development and includes three sites: (1) A demonstration site eight hectares in size which will com

Figure 8 - Silver maple germinates , June 17 (Robinson, S, 2022).

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by Storm Robinson

Figure 9– Sown silver maple germinates at 3 weeks.

pare direct seeding, broad seeding, and planting directly, (2) A scarification/site prep site that is 31 hectares in size which will compare the three previous treatments with a control group under specific harvesting regimes, and (3) a final experimental design that will test the three treatments in herbicide versus non-herbicide treated stands. Our biggest issues we face right now are seed supply, animal predation, and long-term planning, as 1-year-old sugar maple seedlings will not be developed and ready for planting until 2024. The NTSC has put a request out to everyone with the skills and willingness to collect sugar maple seed from anywhere in its range, to please contact us at storm.robinson@hardwoodsnb.ca. Let us save our sugar maple supply for generations to come.

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IN THE SPOTLIGHT:
MEET LOÏC D'ORANGEVILLE
The D'Orangeville lab at the University of New Brunswick

Tell us about yourself and your work at UNB.

I have been an associate professor in the Faculty of Forestry and Environmental Management at the University of New Brunswick since 2018. I teach forest plant identification, forest ecology, and tree morphology and physiology. I also conduct research on the impact of climate change on our forests.

Having grown up in Montreal, I completed a B.Sc. in biology at the University of Montreal, before undertaking a master's degree in forest ecology at the same institution. During my master's, I traveled the agricultural south of Quebec in search of young forests from fallow land, trying to predict the future of these stands dominated by aspen and gray birch. I then spent two years as an analyst for the heritage council of Montreal, an advisory body attached to the City of Montreal, where I assessed the impact of development and conservation projects on the natural heritage of the island of Montreal.

I then obtained a scholarship to do a doctorate with McGill University in collaboration with the Ministry of Forests, Wildlife and Parks of Quebec and the Consortium Ouranos. This is where I started to get interested in the impact of climate change on the forest. I spent four years in a mature fir forest north of Quebec, doing all sorts of experiments such as soil heating, fertilization and artificial droughts to better anticipate the effects of climate change.

With my doctorate in hand, I did research internships in the United States, at Indiana University, and in Massachusetts, at Harvard University, while keeping a foothold in Canada, with the University of Quebec to Montreal.

Can you talk about the goals and objectives of your work

Since relocating to New Brunswick 4 years ago, I have begun developing a laboratory of a dozen students and post-doctoral researchers where we apply different experimental or observation approaches to document and anticipate the sensitivity and adaptability of species of New Brunswick trees to climate change.

In particular, we are currently trying to understand which climatic cocktail is at the origin of the sudden mortality of fir trees that we observed in the province in 2018. I also conduct greenhouse experiments with young trees where we simulate global warming and future drought to better understand tree tolerance. On a larger scale, I use tree growth rings to predict future tree growth. Currently, I am actively working to set up two projects with significant benefits for silviculture. The first project, titled Thirst-NB and conducted in 12-year-old stands with varying levels of pre-commercial thinning, then applying varying levels of dryness using huge

Loïc D'Orangeville (Photo credit: James Broom).

James Broom

IN THE SPOTLIGHT:
MEET LOÏC D'ORANGEVILLE
The D'Orangeville lab at the University of New Brunswick

timber structures to test whether such thinning can reduce the stress of drought. A second project, the TransX project, coordinated by James Broom, consists of establishing a plantation of 10 tree species, 5 conifers and 5 hardwoods including sugar maple, red oak and yellow birch, along a large temperature gradient from Quebec to North Carolina. For each species, we will plant several provenances side by side, i.e. seeds from different climates. This important device will make it possible to better understand the potential of our Acadian species for assisted migration and their vulnerability to global warming.

Are there any links and similarities with your work and that of NHRI?

My laboratory has established several links with the NHRI. In particular, two students who are currently completing their masters with me will continue their careers with NHRI. At NHRI, their responsibilities are to lead specific projects so that the results are delivered at the right time to NHRI partners in the forest sector. The Research Forester and development is responsible for operating the project network and partnership at a high level of performance. They are results-oriented and sensitive to the needs of our partners.

Susan Willis uses a forest simulation model (iLand) to simulate how the forest in Prince Edward Island National Park will perform under various land use and climate change scenarios. Susan leads some activities at NHRI of the Digital Timberlands 20/20 initiative.

Storm Robinson has developed unique expertise on the frost tolerance of trees, studying during her master's degree how different provenances of red spruce varied in the process of frost acclimatization and how these differences explain the differences in growth between trees. Storm directs work related to practices that make our sugar maple resistant to a changing climate and research about the artificial regeneration of maple.

Finally, Cédric Albert, professor at the University of Moncton School of Forestry and who is completing a part-time PhD with me, is working on a theme related to NHRI's work, since he seeks to integrate the effects of climate change on the forest dynamics using Woodstock-type Forest planning models.

Susan Willis

Storm Robinson

Cédric Albert

IN THE SPOTLIGHT:
MEET LOÏC D'ORANGEVILLE
The D'Orangeville lab at the University of New Brunswick

Cédric Albert (right) and UNB students during the installation of the drought device (Photo credit: Martine Lapointe).

Drought device (Photo credit: Martine Lapointe).

A NEW WINDOW ON CURRENT OR PAST EVENTS

RE-VISITING RESEARCH FROM DECADES AGO AND NOT RE-INVENTING THE WHEEL

Maple Regeneration: Doing it differently!

Literature Watch

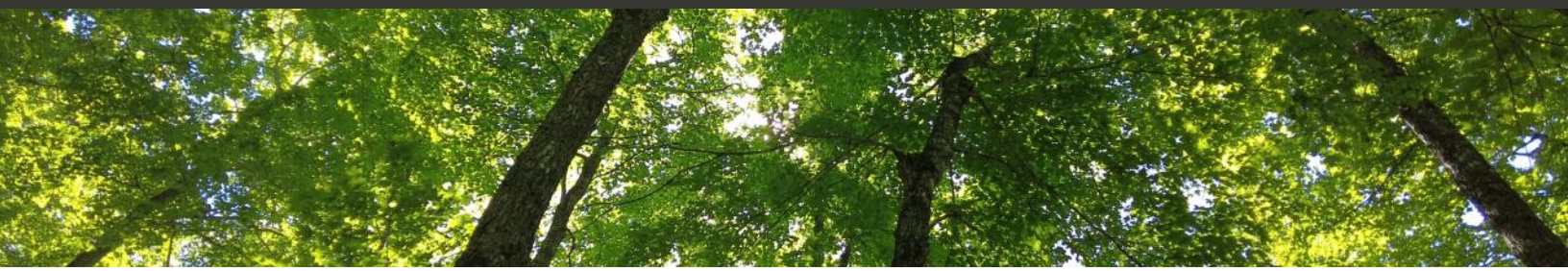
Each new edition of the Leaflet will feature a compilation of scientific publications collected by Michel Huot. Michel is a forestry researcher and retired forest engineer of the Ministère des Forêts, de la Faune et des Parcs du Québec. He continues to monitor the rapidly developing literature in new fields of research including carbon, silviculture adapting to climate change, invasive species and ecosystem management.

Happy reading!

A search for specific literature about artificial regeneration allowed us to find old but still useful papers about seed storage, planting, maple physiology and especially how root system develop after tree planting (Webb). Artificial regeneration may be useful when seed trees are all gone or when we have no seed crop. Past problems and solutions have been described by Fred Von Althen in southern Ontario and by Yawney in Vermont. Young plantings have been successfully established on agriculture lands to create sugarbushes. The following references have been put together to create easy access to published literature. We still need to demonstrate how successful artificial seeding is, regardless of the good potential. Other studies are needed in the case of high value hardwoods before we can expand at a larger scale according to the recent Guide sylvicole.

A NEW WINDOW ON CURRENT OR PAST EVENTS

RE-VISITING RESEARCH FROM DECADES AGO AND NOT RE-INVENTING THE WHEEL



Canada: 1) D.P. Webb

Canadian Forest Service Publications. Germination control of stratified sugar maple seeds. 1974. Webb, D.P. The Forestry Chronicle 50(3):112-113.
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A NEW WINDOW ON CURRENT OR PAST EVENTS

RE-VISITING RESEARCH FROM DECADES AGO AND NOT RE-INVENTING THE WHEEL

Canada: Fred von Althen

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Canadian Forest Service Publications. Effects of root regeneration and time of planting on sugar maple plantation establishment. 1978. von Althen, F.W.; Webb, D.P. Pages 401- 411 in Proceedings of the Central Hardwood Forest Conference II. West Lafayette, Indiana November 14-16, 1978.

Read more

United States

William J.Gabriel. Genetic Variation in Seed and Fruit Characters in Sugar Maple. Res. Pap. NE-404. Broomall, PA: U.S Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 4p., 1978

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Harry W. Yawney, Clayton M., Jr. Carl. Storage requirements for sugar maple seeds. Res. Pap. NE-298. Upper Darby, PA: U.S Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 7p., 1974

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Clayton M., Jr. Carl. Effect of separation in n-pentane on storability of sugar maple seeds. Research Note NE-218. Upper Darby, PA: U.S Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 3p., 1976

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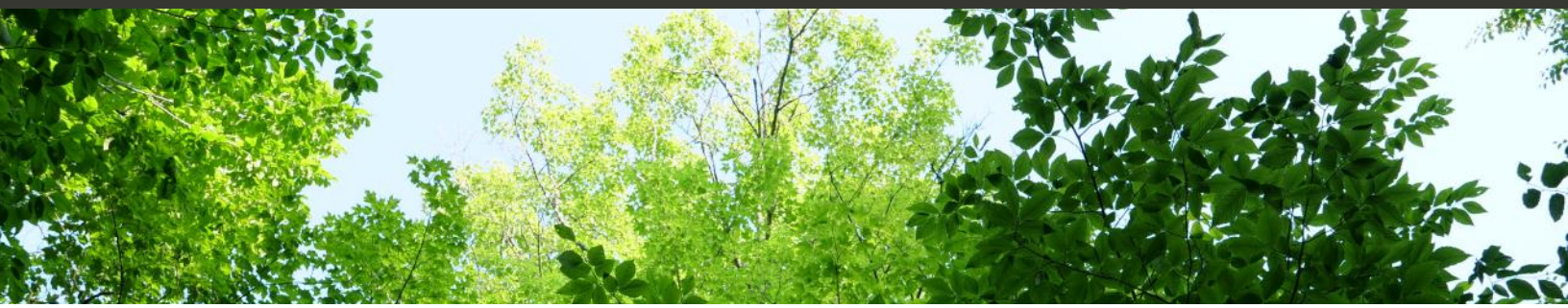
Read more

ATLANTIC FORESTRY REVIEW

NHRI'S CONTINUED COLLABORATION WITH ATLANTIC FORESTRY REVIEW



Over the last two years the NHRI team has been working collaboratively with **Atlantic Forestry Review** to get the word out about managing northern hardwoods in a manner that delivers good financial returns for land-owners and forest managers and long-term sustainability for the forest. This important collaboration has been very strategic for us and allows the magazine to share important information to their readers—based on the results of our various applied research initiatives. Below you will find links to the articles NHRI has produced collaboratively with AFR over the last two years. We encourage you to give them a read and give us some feedback.

On a regular basis, we will be producing a series of articles dealing not only with silvicultural aspects of forest management, but also with game changing technology that is continually evolving in its practicality. These candid articles will bring light to the very promising applied research that is currently happening in the field of forest operations and the digitalization of the forest products value chain. Having publications like

- **THE TIME FOR ADAPTIVE MANAGEMENT HAS COME: What can we do now to ensure our forests thrive in a changing climate?** ***Ruralife***
- **GAELIC POETRY FOR DEAF SEAGULLS? A case study in making sure applied research is useful, and actually used,** ***Ruralife***
- **RECRUITMENT DRIVE: Hardwood management must reverse encroachment by low-value species,** ***Atlantic Forest Review,*** **January 2019**
- **DIGITAL TIMBERLANDS 20/20: New tools for predicting what's inside a hardwood tree,** ***Atlantic Forestry Review*****, May 2022**
- **GET YOUR PRIORITIES STRAIGHT!: Silviculture in mixed and hardwood stands must build on a solid foundation,** ***Atlantic Forestry Review*****, July 2022**

Atlantic Forestry Review for the forestry community fills a gap with regards to mobilizing knowledge so that landowners and forestry professionals can benefit. If you are a member of the forestry sector we encourage you to subscribe to **Atlantic Forestry Review**, for your benefit and the benefit of the Atlantic forestry community.

NHRI NEWS

A WORKSHOP AND A PHOTOGRAPHY CONTEST PARTICIPATION

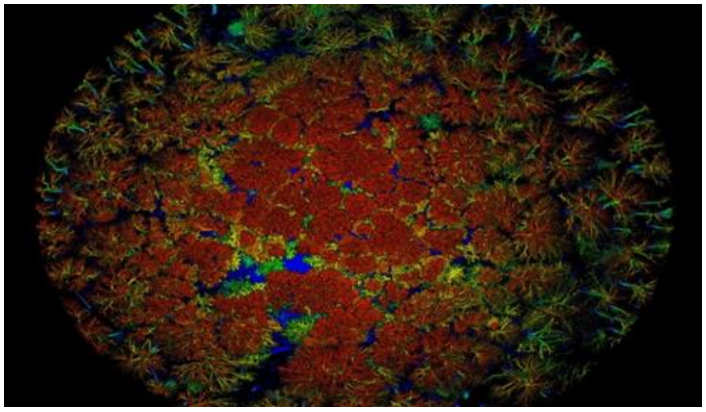
Bastien Vandendaele

WORKSHOP: From July 11th to 14th 2022, Québec City hosted the 10th International Conference on Agro-Geoinformatics and the 43rd Canadian Symposium on Remote Sensing Conference (https://www.icag-csrs2022.org/en). The theme of the joint conferences was "Remote Sensing and Geomatics for Sustainable Agriculture and Environment".

During this conference, some workshops were provided to provide participants with the opportunity to gain knowledge about applications of various remote sensing technologies in several domains, such as hyperspectral, radar, lidar and UAV technologies. These workshops were provided by remote sensing experts in these areas.

Bastien Vandendaele, post graduate student at NHRI, with Professor Richard Fournier from the University of Sherbrooke, presented a workshop entitled LIDAR Remote Sensing. This workshop has introduced the principles of LIDAR remote sensing, the various LIDAR instruments available for remote sensing and their main technical specifications, and the different applications using LIDAR remote sensing. Some practical demonstration on lidar data visualization, manipulation and processing were also presented using some open-source software, such as **Cloud Compare** and the **lidR R Package**.

If you are interested to know more about remote sensing and geomatics, follow these links:
Canadian Remote Sensing Society and **International Society of Agromatics** (ISAM)



PHOTOGRAPHY CONTEST: ACFAS is a Canadian non-profit organization whose mission is to promote scientific activity, stimulate research and disseminate knowledge in French.

The idea of photographic competition **LA PREUVE PAR L'IMAGE** was launched in 2010.

This competition highlights images produced as part of scientific research in all areas of knowledge. In 2016, through a partnership with the Natural Sciences and Engineering Research Council of Canada, ACFAS was able to expand its contest across Canada.

Bastien Vandendaele (postgraduate student at NHRI) submitted an image **À LA LUEUR DES CIMES,** in the context of this contest and his picture was selected among the top photos.

To appreciate this image and to know the context in which it was made follow the link: **À LA LUEUR DES CIMES**

The winner will be determined by audience award and voting will end on Sunday, September 25, 2022. To vote just follow the link : **LA PREUVE PAR L'IMAGE**. If you are interested in Bastien's original picture, vote #14 – **À LA LUEUR DES CIMES**

NHRI NEWS
WORKSHOP PANELIST

Gaetan Pelletier

On June 14, Gaetan Pelletier, Executive Director at NHRI, was invited as a panelist at the Workshop on the development and use of digital management tools in the forest value chain in Quebec.

The organizing committee selected the executive director of NHRI for his professional skills and his involvement in the sector to participate in the discussion table on the subject of **procurement and planning**.

Launched by the Canadian Wood Fiber Center and CanmetENERGY of Natural Resources Canada and organized by Groupe DDM, this event aimed to identify collaborative initiatives to accelerate the digitalization of the sector. A previous workshop was organized by the Canadian Wood Fiber Center and CanmetENERGY in 2020 in Fredericton (NB) and generated very interesting results and partnerships.

To learn more about these companies and organizations, follow the links below:

- **Canadian Wood Fiber Center**
- **CanmetEnergy of Natural Resources Canada**
- **Groupe DDM**

The Northern Hardwoods Research Institute has launched a multi-year initiative to develop solutions in the digital transformation of the forest products value chain for the forest sector in New Brunswick and beyond. One of these initiatives is the Digital Timberlands 20/20 project

UPCOMING EVENTS

FALL MEETING 2022

Canadian Woodlands Forum

Mark Your Calendar!
October 4 – 5, 2022

Canadian Woodlands Forum
FORUM
Forum canadien des opérations forestières
Depuis/Since 1919

WHO SHOULD ATTEND?

- private woodlot owners
- resource managers
- woodlands personnel
- forestry contractors
- community and business groups
- forestry stakeholders

Just watch for program and registration details later this summer!

DETAILS

WHERE?

Four points by Sheraton Hotel and Conference Centre
Edmundston, NB

UPCOMING EVENTS

NHC 2023 NORTHERN HARDWOOD CONFERENCE

Bridging Science and Management for the Future

August 1-3, 2023

Northern hardwood forests occupy millions of hectares in the eastern United States and Canada, representing one of the most economically important and ecologically diverse forests in eastern North America. Northern hardwood silviculture is diverse and complex as well and has been the focus of extensive research for over 80 years. Today, managers continue to seek innovative sustainable management solutions to address the expanding challenges facing this forest type, including serious threats such as invasive species, inadequate tree regeneration and shifts in composition, degraded timber quality, herbivory, climate change, nitrogen deposition, and forest fragmentation. The 2023 Northern Hardwood Conference (NHC) will give researchers, academia, and forest managers from across the range of northern hardwoods a forum to learn, share, and discuss cutting edge science and innovative management practices to sustain healthy and productive northern hardwood forests.

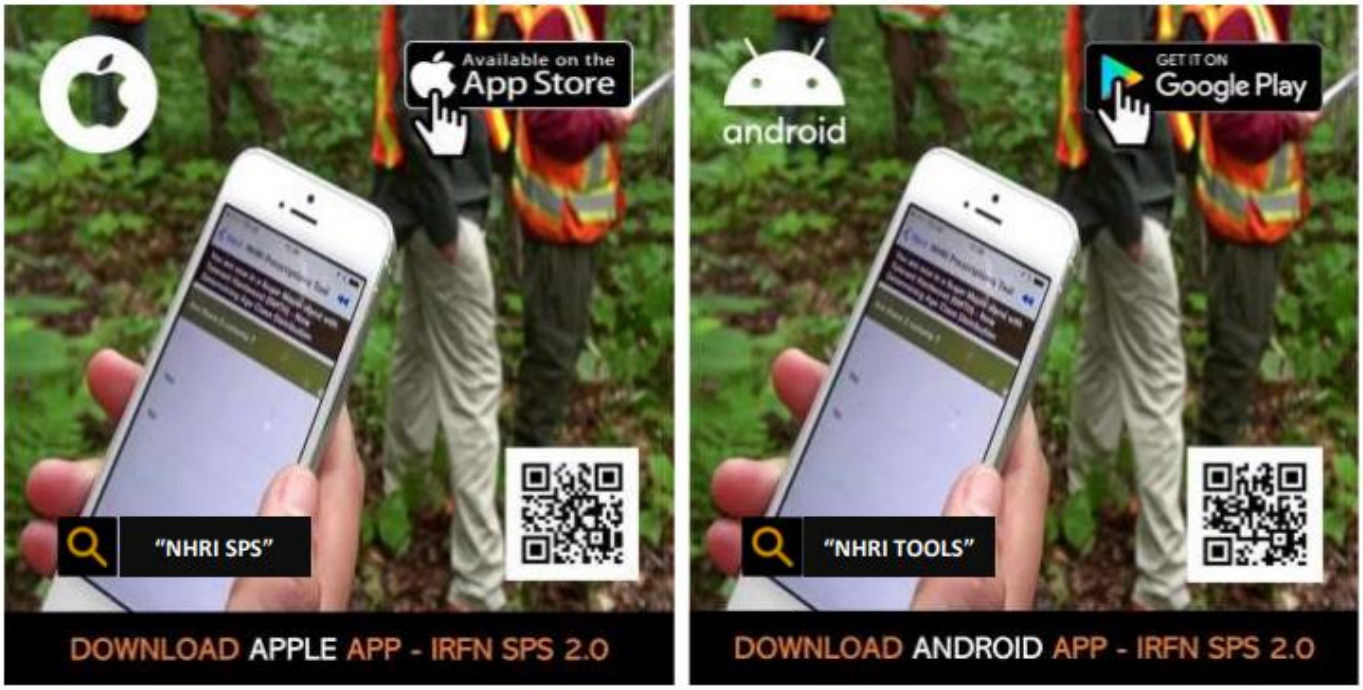
The conference will be developed under the framework of "leveraging technology to improve silviculture and the digitalization of the value chain"; an innovative Canadian initiative in which New Brunswick will be the pilot and NHRI will be involved in a leadership role. This conference will illustrate key steps to the restoration and sustainability of hardwood and mixed wood forests in the northeast of North America.

The showcase forest site will be used as a state-of-the-art educational and training tool to demonstrate adaptive silviculture techniques focused on problem solving and finding solutions at the operational level. The demonstration forest is also a site for training foresters and technicians from UNB, l'Université de Moncton, the Maritime College of Forest Technology, and the University of Maine.

The event partners include the Province of New Brunswick, AV Group, UNB, l'Université de Moncton and the Canadian Forest Service, as well as private landowners and forest managers.

APP UPDATE

LATEST VERSION OF NHRI SPS 2.0 NOW AVAILABLE !



An updated mobile phone application is available for both I-Phone and Android devices. The App was designed with an easy to use interface through which you can rapidly obtain a prescription for a given hardwood stand. The user simply answers a sequence of questions about the characteristics of the stand which ultimately leads to the recommendation of a specific prescription. All that is left to do is to consult the silviculture framework and prescription tearsheets to ensure stand eligibility, management objectives and operational conditions are respected.

Downloading or update the App is easy!

- Search "*NHRI SPS* " in Apple App Store
- Search "*NHRI TOOLS* " in Google Play
- Visit our website www.hardwoodsnb.ca/tools

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