

CDL's Way

Sugaring Guide - Second edition | 2022



Take good care of your membranes and they'll serve you well!

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The Master-E : A CDL evaporator is now available in its electric version!

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Sugarbush Trends

Pre-lashed mainlines and SpinSeal technology

A winning CDL combination!





Today, we are pleased to present the 2nd edition of our magazine, CDL's Way.

You will have the chance to discover plenty of articles, news, and tips on what's happening in our industry in 2022.

Energy costs, labour shortages, production costs, and sustainable development are guiding CDL's current innovation projects. I hope you enjoy those we have chosen to share in this edition.

The maple industry still has a high potential for growth. The use and integration of new technologies will be necessary to reach new performance and quality standards. Artificial intelligence is on our doorstep and will soon be part of the working tools offered at CDL.

Although technology is more and more present in sugarbushes, the magazine will always have an important place for producers who use traditional methods of production in order to maintain and value this tradition.

Enjoy your reading!

Martin Chabot

*Co-owner and
general manager of CDL USA*



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Special collaboration
By Réjean Bilodeau

Writer and researcher on maple syrup production

WHEN COLLABORATION AND SHARING COME TOGETHER

It was during the 2016 CDL open house event and the launch of my first volume at the Saint-Lazare CDL administrative centre that I discovered this unique and festive atmosphere gathering several Bellechasse families together with those from surrounding regions across Canada and the United States. This first activity also allowed me to realize the strength that emanates from this family of entrepreneurs who venture out and influence those in maple syrup production by providing them with the necessary maple syrup production equipment, but more importantly, by sharing their entrepreneurial spirit and desire to achieve impeccable excellence!

I remember very well the moment, while addressing the crowd on a platform improvised by Mr. Jean-Marie Chabot, when I understood that CDL, with the Chabot family at its head, would be the most efficient way for me to spread our Bellechasse identity throughout North America via maple syrup production. Shortly thereafter, Bellechasse was recognized as the **birthplace of the world's maple syrup production technology** with the support of the RCM and the governments of Ottawa and Quebec, all before our logo was created under the supervision of Mr. Claude Lepage, cultural director at the RCM of Bellechasse.

Since then, CDL has continued to feature our logo in tens of thousands of printings in its various publications and advertisements, in addition to purchasing several hundred of my four volumes, published in 2016, 2018, 2020, and 2022. These historical volumes mainly contain the family histories of Bellechasse and Quebec families, highlighting the Bellechasse figures who have helped us find and shape our identity. They are, in chronological order, the Goulet, Vaillancourt, Labrie, Métivier, Chabot, Boutin, and Pouliot families, all preceded by Michel Sarrazin.

At the time of writing, Bellechasse, through its RCM and the Fabrique de Saint-Philémon, is concentrating its efforts in the Parc régional du Massif du Sud and at the church of Saint-Philémon, in order to create two identity-based sharing centres: one on an international scale, focused on audiovisual, and the other on a regional scale, focused on museums and the Bellechasse identity. With this spirit of pride, we are initiating these two projects supported by this niche heritage that has branded Bellechasse as the birthplace of maple syrup production in North America for more than 300 years, while CDL shares our identity in Western and Northern Europe with France and Latvia.



MRS. MARTHE FRADETTE &
MR. JEAN-MARIE CHABOT

Jean-Marie Chabot was recognized as the World Master of Maple Syrup Entrepreneurship in 2017 and received a trophy from the I.M.A.C. Institute, where he was unanimously recognized by all members, in 2014. Under the leadership of Jean-Marie, who is joined by his three sons, CDL has become a world leader after 30 years of operation!



THE 3 BEST FOR SHARING OUR IDENTITY
ON A GLOBAL SCALE: THE 3 BROTHERS
MARTIN, MARC-ANDRÉ, AND VALLIER
CHABOT





By **Maryse Bernier**
Marketing Director and Customer Experience

STEP BY STEP TOWARDS THE **SMART SUGARBUSH**

Today, no matter what our lifestyle, we are short on time! The CDL 4.0 vision, progressing towards 5.0, allows all maple syrup production enthusiasts to realize their passion while preserving the quality of life that has become so dear to us. At CDL, this is what we had in mind when we started developing CDL Intelligence a few years ago. If this 4.0 vision seems impossible to achieve in your sugarbush, know that you can implement it gradually starting now. It's much simpler than you think, since "keeping it simple," whether you're tech-savvy or not, was a priority objective for our development team. The ultimate goal of 4.0 is to have complete synergy between all automated syrup production steps. Over time, we have connected more

and more systems and eventually, we will be able to say that the smart sugarbush is almost entirely autonomous! To achieve this, you don't need to connect everything at once. So let's take a step-by-step look at what CDL Intelligence means for your service.

Basically, in the forest, our objective was to reduce the time needed for analysis and intervention. A connected forest makes it easier to manage priorities and teams. Geolocation (GPS) and continuous communication greatly help to make this management efficient. Information such as vacuum level reading data, the weather station, and freeze reports provide increased support for your workforce management



In a few years, all our sugar bushes will be smart.

This will become the way things are done. One will wonder with amazement how we managed 'before'!

— **Serge Tanguay**,
Sales Director - Canada

and decision-making. The data from the vacuum sensors installed in the sugarbush helps to avoid frequent trips that drain your energy by allowing you to intervene quickly at the right place. Working time is reduced thanks to remote monitoring. Productivity is maximized since leaks are detected much more rapidly. More water and less work time makes for a profitable combination!

The smart pumping station is fully automated and autonomous. You control it remotely. You can see the incoming water volume level and its Brix. If you have added camera surveillance, you won't miss anything, without having to go anywhere. The management of the pumps according to the vacuum and the temperature is also a controlled parameter.

Autonomy and simplicity prevail again in the tank as well as in the osmosis system. Since all your data





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is collected, you have control over the management of levels, valves, and the tank's remote washing. As for osmosis, it really couldn't be simpler, everything is done by itself once the programming is set up.

During evaporation, you control the boiling parameters according to the season's progress, giving you great flexibility. Managing the heat, controlling the Brix levels and, as a bonus, automated washing, all promise to save time. Of course, in the 4.0 environment, filtration is also automated. When bottling, the data reading will provide support for the system's autonomy, in addition to facilitating the management of inventories, their mass, and their temperature.



Our vision of the future is a happy maple syrup producer who is in control of their entire production process, from tree to bottle, with a smart system that fits in the palm of their hand. The improved productivity ensures a satisfactory return on investment and CDL, as a good business partner, has supported them every step of the way to ensure success

— Serge Tanguay,
Sales Director - Canada

For now, CDL offers you intelligence up to the filtration step. Subsequent steps will follow to complete the full cycle of the smart sugarbush.

If you're worried that something is not quite right and that you will find yourself at a loss when faced with this cutting-edge technology, be sure to take CDL's after-sales service into account. At CDL, maple syrup producers are the ones who think about innovation. So, the after-sales service is a must that comes with the equipment!

TRANSPORT TANKS:

STRONG, SAFE, AND EASY TO HANDLE

Stainless steel transport tanks are a key part of the equipment that will make life easier for any maple syrup producer who must transport their maple water from one site to another.

Our new line of tanks has been designed specifically for maple syrup production. The use of used tanks, even if they were used for food purposes, always involves unwanted risks. Quality is an absolute must.

In addition, transportation can still bring its own worries, without being dangerous. Our tanks are made of 304 food grade stainless steel with a brushed finish and sturdy construction, and reflect the usual CDL quality. Available in four different sizes from 500 to 3,800 gallons, they all have inspection ports and the larger ones have wave separators. Since they're installed on a stable arch system, transportation is simple and secure. The 3-inch inlets and outlets as well as the lifting anchors for installation are included. Depending on your needs, you can add a visual level indicator, a single or double wash ball, and a ladder.

- 66TR500 (500 gal US)
- 66TR1000 (1 000 gal US)
- 66TR3000 (3 000 gal US)
- 66TR3800 (3 800 gal US)





By Jonathan Côté
Marketing Project Manager -
Product and Customer Service

CDL INTELLIGENCE

Not that long ago, we never could have imagined, even in our wildest dreams, that we'd have access to a wealth of data in real time and be able to control virtually all of our sugaring equipment remotely. However, thanks to CDL Intelligence, that dream has been coming true in more and more sugarbushes over the past few years. A simple concept—being able to monitor the vacuum of each master line in real time to save time on leak repairs—planted a seed from which grew the idea of fully remote control. And now that idea is bearing fruit.

CDL Intelligence is for all producers, no matter how many taps they have. As you know, one of CDL's mottos is "by sugarmakers, for sugarmakers." So, who better than CDL, the undisputed leader in the maple syrup industry, to develop a system that's flexible enough to suit all situations and modular enough to grow with producers? Whether you want to track vacuum, tank, or silo levels; remotely start or stop pumps; adjust the vacuum with our highly popular vacuum modulation valve; see the water flow and quantity in real time with a flowmeter; open and close valves; protect your transfer pumps with the new pump safety module; see everything happening in your sugarbush in real time without breaking the bank; manage employees; or so much more, it's all possible with the new CDL Intelligence app. It's an advanced and ever-evolving system. Imagine the time savings. Imagine the efficiency boost. Imagine the yield! Not very computer-savvy? Don't worry about it. CDL Intelligence is very





By Alain Godbout
Regional Service Manager

easy to use thanks to a simplified and user-friendly interface and app.

CDL Intelligence also has a great new feature: remote control for ROs. This brand new process allows you to remotely control any RO, regardless of its make, model, or size. This system doesn't make the RO "intelligent" like our range of CDL intelligent ROs. However, the system is modular, so it can be tailored to your needs. From starting and stopping the system to tracking the Brix to (partially or fully) controlling your valves by reading and adjusting the pressure, you can run your RO from anywhere as if you were right in front of it. A simple, efficient system that will save you time and money!

By combining these innovative products with CDL's renowned quality and unparalleled service, you will experience CDL Intelligence. Your yield is what makes your sugarbush profitable, so why not make sure you're maximizing it? Don't hesitate to contact your CDL representative, your regional CDL store, or CDL customer service to learn more!



MAPLE SUGARING
MANAGEMENT SYSTEM

A LOCAL REGIONAL SERVICE, EFFICIENT AND THERE WHEN IT COUNTS!

Taking care of our customers and adjusting to their changing needs has been one of CDL's values since the very beginning and has been passed down through the generations.

In order to offer its products as well as excellent service to all its customers, CDL will strengthen its regional service in the coming months and years.

It became clear that our clients would benefit if CDL offered a regional technical service that was present during the period that matters most to all maple syrup producers, and in all maple syrup producing regions. This proximity of service technicians to customers is an added value for CDL customers. Eventually, each regional corporate store will have its own technical support technician.

All CDL technicians are trained to be effective in customer support. This involves basic training for all new technicians and continuous training thereafter. In the same way that CDL is an innovator in sugarbush products and equipment, it also seeks to innovate in training techniques for its employees. The most effective means are used—from videos to virtual guides—to facilitate our technicians' learning. We never strive for anything less than excellence in serving our customers, whether they are our affiliated dealers or their customers.



The vision of efficient local service will also be put into practice for the parts and equipment department. The intention is to ensure that all corporate stores and affiliated dealers receive parts and equipment in a timely manner so that no matter what happens to them, the customer will find what they need at the right time. This deployment of technical resources and accessibility of parts and equipment will gradually take shape by next season. CDL's affiliation with the BMR chain will also facilitate this accessibility to parts and equipment at extended hours and more service locations.

The sugar season is so short, CDL promises to be everywhere while it's happening.



By Lionel Turmel
Customer service and expert

TAKING YOUR FIRST STEPS WITH 100 TAPS

For a few years now, CDL has been encouraging hobbyists to experience the joys of maple sugaring by providing all the equipment beginners need. The information below will give you some insight into the kind of equipment you'll be looking for as a new producer. To learn more, please check out our site or talk to one of our CDL dealers.

NANO RO SYSTEMS

Over the past few years, the desire to return to nature and become more self-sufficient has caught on in a big way with Quebeckers, leading many to rediscover the old-timey pleasure of producing their own maple syrup! And while a few enthusiasts may have enjoyed boiling sap 'til the wee hours, most people never seem to mind having some time-saving equipment on hand! CDL offers the Nano reverse osmosis systems that give small-scale producers a real boost. The three-membrane Nano with recirculation pump can handle up to 150 taps, eliminating 10 to 13 gallons per hour and achieving 5 to 6 Brix. That said, it's important to understand that the goal isn't to increase the Brix but to reduce boiling time by a factor of two or three.

The performance is enhanced by a two-stage pre-filtration that removes impurities. The Troubleshooting Guide is easy to use, and technical support is always available. What's more, hobbyists who want to try their hand at birch syrup can do so with the same equipment since the Nano ROs work for both types of sap! CDL always advises that you order your equipment a few months in advance to get a head start on the fun of sugaring.



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INNOVATING TO MAKE LIFE EASIER FOR MAPLE SYRUP PRODUCERS



BUCKETS OR TUBING?

There are two ways to collect maple sap: the traditional bucket method, or by using tubing that runs from tree to tree and feeds the sap into a single tank by gravity. Just to give an idea of the investment required for each method, you should be aware that the tubing system is less expensive than the bucket method. For example, for 100 taps, on a lot with the right slope for a gravity system, it costs around \$3 to \$5 per tap for the spiles, tubing, and fittings. For the same number of taps, the spiles, buckets, and lids will run you around \$10 per tap.

Next, you'll need to choose an evaporator. CDL offers a complete line of small evaporators for sugar bushes with as few as 25 taps, or up to 200 taps with our Hobby wood-fired evaporators. Go for fun or efficiency— though you can totally do both! It's up to you. We're here to help!

IP CAMERAS:

CONTROL AT YOUR FINGERTIPS, WHERE YOU WANT IT

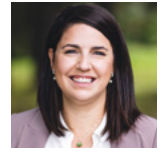
The camera and the CDL Intelligence app are easy to install and control, regardless of your level of computer knowledge. The camera is affordable, elegant, intuitive, and most importantly, easy to configure. No matter how many cameras you decide to install, you can place your extra set of eyes according to your surveillance strategy. You can start by installing one or several, and add more the following year. You decide where they go, and at what pace!

Also, the CDL Super HD camera allows you to monitor your sugarbush day and night with its night vision covering up to 33 feet and using 13 infrared LED lights. Up to 16 predefined positions allow you to focus and easily monitor the chosen locations.

The camera works with Ethernet or 2.4/5 GHz dual-band Wi-Fi networks, so with reliable Wi-Fi you can access your camera through the CDL Intelligence surveillance app on your mobile device and PC whenever you want.

20210





By Marie-Myriam Dumais Synnott
Director of the Maple Syrup Niche of Excellence

STRENGTHENING THE INDUSTRIAL SYNERGY OF THE MAPLE SUGARING SECTOR

In the fall of 2020, the Quebec government positioned maple syrup production as a specific industrial skill set for the Bas-Saint-Laurent, Gaspésie, and Chaudière-Appalaches regions, by recognizing the Maple Syrup Niche of Excellence within the ACCORD program. This program builds on regional strengths and the search for excellence in Quebec's key industries.

The Maple Syrup Niche of Excellence is a true driver, strengthening the field's industrial synergy by mobilizing stakeholders, forging alliances, and supporting core projects. It is also a major financial vehicle that generates significant economic benefits.

"We support numerous innovation projects and promotional activities, along with much research and training, with the goal of fostering the growth and



| Sugarbush La Coulée Creuse inc, Saint-Athanas, Quebec

development of the maple syrup industry while keeping sustainable development in mind," says Marie-Myriam Dumais Synnott, Director of the Maple Syrup Niche of Excellence.

After just two years of existence, the organization already has the wind in its sails. Its partners and the 27 members of its board of directors can all take credit for that success.

"The maple syrup industry is going strong. The Maple Syrup Niche of Excellence is a good example of the way major players can come together to help the industry move forward. Our industry has once again shown that working together to innovate is always a winning strategy for the community," said Guy Voyer, President of the Maple Syrup Niche of Excellence.

CDL Maple Sugaring Equipment provided several different types of support for the implementation of the Niche. They were involved in its development and structure, on its Board of Directors, and on several projects, including the Réseau 4.0 acéricole, a network that has supported companies in accelerating their production processes. Through that project, key personnel have been able to receive training on the integration of new tools and innovative methods to make their company's operations more profitable and, overall, help the industry improve.



By Steve O'Farrell
Research and Development Project Manager

TAKE GOOD CARE OF YOUR MEMBRANES AND THEY'LL SERVE YOU WELL!



MASTERING THE ESSENTIALS: WASHING, MAINTENANCE, AND STORAGE

If you have any type of reverse osmosis system, you already know how much valuable time it saves you. That is, as long as you maintain the membranes in order to maximize their performance. This means completing three essential steps each season: washing your membranes at the beginning of the season, washing them throughout the season, and storing them once the season ends. It's easier than you think to master these steps, and the result, well-maintained membranes that are worth the effort you put into them. We describe the procedures for all of these steps on our website: [\(link to be added\)](#)

WHY WE RECOMMEND CDL MEMBRANES

The membrane is the heart of the reverse osmosis system and is by far its most delicate component. Consequently, taking care of the membranes is essential to your sugarbush's performance. Why not take advantage of advanced CDL membrane technology to



minimize the risks of clogging and premature wear and to maximize the system's performance? They provide superior circulation and their LF membrane filter reduces fouling. At the same time, CDL membranes allow for superior retention of mineral salts to ensure that the finished product maintains maple syrup's nutrient profile. What's more, their outstanding manufacturing quality means that they are robust and more resistant to washing. That quality is all the more important since their performance is influenced by a dozen different factors. These factors were taken into account as CDL's membranes were developed. Finally, CDL offers

three different diameters (4, 8, and 16 inches) to fit all types of reverse osmosis systems.

START-OF-SEASON WASHING METHOD

When membranes clog in the first few days of the season, it can be quite frustrating because they lose their ability to let the permeate pass through very quickly. In an hour or less, you can see the permeability of the last membrane drop to almost zero. Why is this? The first sap contains varying concentrations of a substance that has collected in the maple tree throughout the winter. This plant cytoplasm is very rich in proteins,

mineral salts, and dissolved organic matter; concentration causes it to collect quickly on the surface of the membrane, causing clogging. Here are some tips to help you avoid or limit inconveniences when running your RO systems:

- Reduce the concentration to 10 Brix.
- Keep a close eye on the performance of the membranes, especially the last one.
- Don't allow the system to concentrate for too long, because it's harder to restore the original performance after severe clogging.
- Alternate citric acid with alkaline washes, rinses, and acid treatment.
- Run performance tests (PWP) to make sure the washes are working; repeat as needed.

WHAT TYPE OF WATER SHOULD YOU USE?

Ideally, you should always use permeate. If this is difficult or impossible, you can use soft water that is low in mineral salts and very low in iron and manganese. Surface wells generally contain very little iron and manganese. However, you have to be very careful with the bacterial load of the water. Chlorinated water should also be avoided unless it is de-chlorinated by pumping at least 24 hours in advance.

MAINTENANCE: WASH DAILY WITH SOAP

Perform a 15–20 minute rinse at 50% membrane capacity, followed by a 30-minute soap wash at 30 degrees Celsius and a 30-minute rinse at 50% membrane capacity.



Picture: complete-water.com

The alkaline wash should be repeated if the solution becomes cloudy. The solution of the final wash must be clear.

If necessary, you can perform an acid wash after completing the first step; to do so, add the acid wash, then rinse at 50% membrane capacity, followed by a soap wash and a final rinse at 50% membrane capacity.

If sterilization is necessary, add it after the first two steps.

The last step is sterilization with Oxysan, followed by a rinse at 50% membrane capacity.

AT THE END OF SEASON

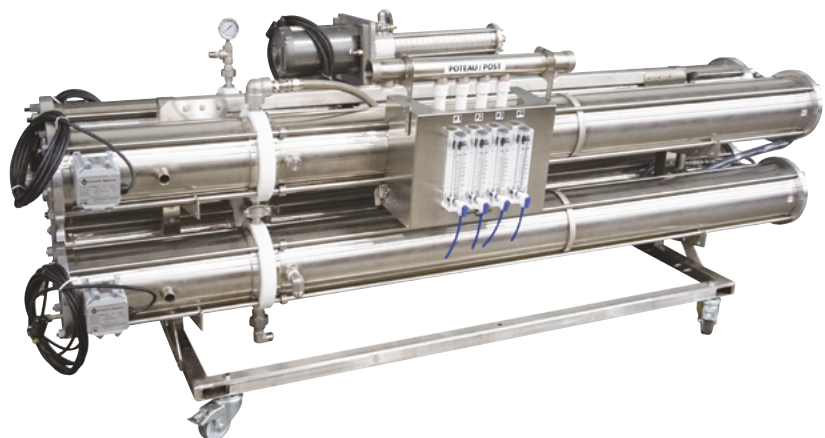
It's important to carefully follow our storage recommendations:

1. Store the membranes in a cool, frost-free place.
2. Prepare a solution, ideally with permeate or with fresh water that is low in mineral salts, iron, and manganese.
3. Mix 1% sodium metabisulfite (by weight) with the permeate (½ lb/5 gallons SMBS).

WHEN TO WASH THE MEMBRANES: THE 15% RULE

- A 15% loss in performance during the concentration process should be corrected with an alkaline wash and, if necessary, an acid wash;
- Citric acid is an excellent preservative against bacterial growth. It should be used on a regular basis;
- Membranes can be soaked in this acid for several days without damaging the equipment or the membranes;
- During the season, it can be used when the system isn't running;
- Wash the membranes at least once a day;
- Never let the membranes rest in the concentrate.
- After shutting down the system, de-sugar it and rinse it briefly with permeate.

4. Mix well and pour into the membranes' storage canisters.
5. For longer-term storage, replace one gallon of water with the same amount of food-grade glycerin or propylene glycol with the same proportion of sodium metabisulfite. This mixture does not protect against freezing.
6. For freeze protection during storage, make a 50/50 mixture of Water and glycerin or propylene glycol, add metabisulfite, and mix well. The 50% propylene glycol blend is available at your local CDL dealer in 20 litre tubs.



By Vallier Chabot

Co-owner of CDL, gives us an update on the maple nectar project. He answers questions from **Annik Perron**, editor for CDL's Way.



A NEW OPPORTUNITY FOR MAPLE SYRUP PRODUCERS:

MAPLE NECTAR

Annik Perron (AP)— Since 2016, your R&D team has been working on a process that allowed you to develop a new natural sweetener, maple nectar, that could benefit the industry and optimize maple resource operations. Can you remind us what this process developed by CDL consists of?

Vallier Chabot (VC)— First of all, it is important to know that this new product, which has been called nectar until now, does not replace maple syrup at all! It is a brand new nutritional ingredient that will be mainly used by the food industry. What was developed by our R&D team consists of routing maple water through a process that combines ultrafiltration, concentration, and evaporation at a low temperature so that all the original properties of the natural sap are preserved. It is very exciting from a nutritional point of view, hence the great interest of the industry. At this point, the sap has reached 60 to 70 degrees Brix, depending on the needs. At the end of all these steps, the product is stable and can be stored at room temperature, and this is what we call maple nectar. Also, the process is flexible and it is possible to produce a customer's desired Brix.



| From left to right: raw maple sap, ultrafiltered sap, ultrafiltered concentrated sap, 66 Brix maple nectar.

AP— What are the project's developments in the past year?

VC— We can now say that we are in phase three of this project. After having completed the work on the production equipment, we now need to position the product in the market, and there is no doubt that we will be able to attract several potential partners with an ingredient that preserves the nutritional qualities of maple water. It is definitely current in food trends to want to decrease or eliminate refined liquid sugars by using more natural agents that offer the same taste. The industry will need to do its own testing first to fully understand how to use the product. This is what we need to accomplish in the next

year in collaboration with some of the major players. The technology will be patented and there is a lot of interest in this innovation.

AP— Do you envision this product consolidating CDL's leadership in promoting maple syrup production?

VC— Absolutely. At CDL, we are very proud of this innovation because it has the potential to advance the entire maple syrup industry. The nectar will be added to the range of products from maple trees, with a possible large-scale industrial use. Maple syrup production is destined for a bright future and we are very happy to participate in its progress with our innovations.



By Sylvain Côté
Manufacturing engineering

THE CDL VARIABLE SPEED EXTRACTOR

The variable speed extractor operates by pumping sap continuously, even if the sap flow from the trees varies. The pump's capacity rises or falls according to the amount of sap flowing into the extractor. It can do this thanks to a series of probes that continuously monitors the sap levels. The probes are connected to the drive, which allows it to make the pump adjust its speed. As with all CDL equipment, cleaning is as easy as possible. It's important to release the vacuum inside the casing before cleaning.

To ensure accuracy, the probes inside should be serviced occasionally. The variable speed extractor is a small device that simplifies the work and avoids the risk of the drain pump not being able to keep up the pace during periods of intense flows or during a thaw. It can also be added to the CDL Intelligence system.

ADVANTAGES OF THE VARIABLE SPEED EXTRACTOR

- Continuous sap evacuation
- Soft start and stop of the pump
- Minimizes spikes in amperage
- Stays cleaner
- Continuous action





By **Marc-André Chabot**
Co-owner of CDL and
Vice President of Research and Development

THE MASTER-E :

A CDL EVAPORATOR IS NOW AVAILABLE IN ITS ELECTRIC VERSION!

In recent years, changes have been happening in the maple syrup industry. The market continually forces maple syrup manufacturers to adapt and develop new products and technologies. The growing common environmental awareness, the growing cost of energy and the concern for efficiency and performance are pushing forward innovation

This concern for innovation is constant in the various CDL teams. For more than three years, the CDL Research and Development team has devoted itself, among other things, to pushing the current limits of evaporation. The thinking and working parameters are of course a mixture of the constraints related to the quality end products, as well as the needs of the customers in terms of productivity and energy efficiency. The conclusion of the discussions has brought CDL to offer today a new 100% electric and automated evaporator while maintaining the quality of the syrup.

To contribute to the electrification of sugar bush equipment, which has grown over the years, CDL is proud to launch a brand-new electric evaporator: the Master-E!

The Master-E is nothing like a conventional evaporator. Its revolutionary concept in the maple syrup industry optimizes the heat exchange between the sap and the heating tubes. The 2023 model of the Master-E aims for a production capacity of two barrels per hour. However, other models will be added over time so that the technology could be used by all maple syrup producers.

Like much of CDL equipment, one of its outstanding advantages is the little manipulation required since it is fully automated. The Master-E corresponds 100% with

our vision of the sugar bush 4.0. It can be controlled remotely via different devices. This highly reliable evaporator can therefore operate alone, without constant supervision. Rest assured that the Master-E also honors the high energy efficiency standards of our range, thanks to the use of renewable energy.

Built entirely in stainless steel, the Master-E will offer you an exceptional lifespan. This new easy-to-use evaporator is also very safe to operate thanks to its automation and its closed evaporation circuit. This is an important element given the intensive use that will be made of it during sugaring season.

From a syrup quality point of view, the optimal short residence time inside the system will ensure an exceptional taste of the final product that meets your expectations. In addition, you will find very little sediment buildup on the heating tubes, which optimizes performance over long periods of boiling and makes it easy to clean and maintain. The evaporator is designed for boiling at any Brix. With a very low syrup production cost, the Master-E will quickly become an irreplaceable piece of equipment in your production process.

DESIGNED FOR AND BY MAPLE SYRUP PRODUCERS!

At CDL, our research and development team is made up of experts with extensive experience in the field; that's why we chose this slogan. **"Designed by and for maple syrup producers"** is so true! True to the CDL brand, the installation of the Master-E is characterized by simplicity. Simplicity which is also present during maintenance thanks to the automated and rapid washing. It is always appreciated that the equipment performs well while taking up as little space as possible



| Front view of the Master-E evaporator. Picture shown is for illustration purpose only.

in your sugar cabin, which is the case here. No vapor escapes from this evaporator since it is completely condensed to be discharged into the sewer afterwards. So, no need to install a chimney! The first Master-Es will be in operation with some of our customers for the 2023 sugaring season.

In short, this revolutionary equipment will offer maple syrup producers unequalled energy efficiency, in addition to using green and renewable energy.

Fully automated and safe, the Master-E offers great boiling flexibility and takes up little space compared to a traditional evaporator and offers exceptional performance in terms of energy used, maintenance required, labor required, production cost and quality of maple syrup produced.

Want to see the Master-E in action? Inquire about a visit to the new technology showcase planned for this fall with our team.



CDL VERTICAL SILOS

SPECIFICALLY DESIGNED FOR SUGARING NEEDS

- ✓ Superior quality, CDL fabrication in brushed stainless steel (11 gauge)
- ✓ Reinforced urethane insulated base with reinforcement belt and 4 anchor points
- ✓ Sloped bottom for complete drainage
- ✓ Available sizes:
8 foot diameter:
Height of 7.5', 10', 12.5', 15', 20' and 25'
12 foot diameter:
Height of 10', 15', 20' and 25'

SCAN TO SEE
THE VIDEO

bit.ly/cdlvideos



INCLUDES:

- > 360° rotating spray ball
- > Manhole at the bottom
- > Water inlets (1 from bottom and 1 from above) and outlet 3"
- > Air vent with screen for venting without bugs or any undesirable debris

OPTIONAL:

- > Personalization with your name and/or logo
- > Manhole on top
- > Ladder and platform following all the safety standards in Canada and the United States
- > Protection cage for ladder
- > Many pump models available for spray balls (piping and connections extra)
- > Pressure transmitter, temperature transmitter and level indicator through the CDL Intelligence system
- > Cage to link building to silo
- > Stainless steel top feed plumbing
- > Stainless steel supply plumbing for rotating spray ball



By Maurice Beauchamp, P.Eng,
Director of Operational Effectiveness

THE MASTER EVAPORATOR: **SAVING GREEN BY GOING GREEN**



Today, producers who are looking for new equipment are generally seeking performance, profitability, simplicity, and time and energy savings. When a piece of equipment meets all these criterias, CDL recommends it without hesitation!

The CDL Master Evaporator is the only one on the market to evaporate more than 5.1 imperial gallons (6 US gallons) per square foot of pan. It's also a robust, well-manufactured machine. This helps make it more energy efficient and, like all CDL equipment, easier to use. The evaporator is flexible, running in boiling conditions from 2 to 35 Brix, and allows for long boiling sessions without changing pans. Of course, the final product is always important as well, and this evaporator makes sure the flavour and authenticity of the syrup are top-notch. The evaporation performance is exemplary and the machine is easy to clean, which makes all the difference! What's more, the power is fully manually adjustable thanks to the feed screws that provide control of the pellet feed. Also, using a fuel like wood pellets makes the system's GHG emissions almost non-existent (carbon-neutral). The energy and labour costs per barrel are hard to beat. Finally, the Master evaporator has an impressive list of included and available options. To learn more about the Master Pellet Evaporator, visit our website, talk to a CDL dealer, or pick up the phone and tell us about your plans!

INCLUDED AND AVAILABLE OPTIONS

- Syrup flow reverser
- Double pass flue pan
- Syrup drip tray
- Multi-pass syrup pan
- Filtrate/concentrate preheater
- Mechanical or electrical level control
- Control panel with 110 V outlet
- Front/rear Protec-O
- Front/rear pan washer
- Motorized level control



Master Pellet Evaporator

	Brix					
	15	18	20	22	25	30
Cost / US gallon	\$0,97	\$0,77	\$0,68	\$0,60	\$0,50	\$0,38
Cost / Imp. gallon	\$1,16	\$0,93	\$0,81	\$0,72	\$0,60	\$0,46

Based on a price of \$240/metric ton

Master pellet evaporator located at l'Érablière Marcel Vien in Sainte-Claire.



By Christian Gosselin
CDL product manager - Forest Division

SUGARBUSH TRENDS

PRE-LASHED MAINLINES AND SPINSEAL TECHNOLOGY: A WINNING CDL COMBINATION!

If there is one constant at CDL, it's our goal to simplify your sugarbush operations and save you time and money. With our pre-lashed mainlines and SpinSeal technology, these goals are fully within reach. The combined use of these two technologies, exclusive to CDL, continues to grow among our customers, both small and large maple syrup producers. This combo will save you \$0.75/tap in labour and materials. It's the best value for money in the industry as it provides you with a long-lasting reliable system that requires little maintenance. As they say, just try it; you'll love it!

THE CDL PRE-LASHED MAINLINE: ONE PASS AND IT'S DONE

Installing pre-lashed tubing is three times faster than a traditional installation because it takes just one step instead of three, which explains its ever-growing popularity. In addition, it has a superior quality, high-tension main wire and stainless-steel lashing wire for added durability. Consider using CDL's pre-lashed mainline to make your life easier when installing at heights or in rough terrain. You no longer have to run lash wire on site since we take care of this step in our factory, according to our highest quality standards. Rest assured that in the end, the cost of

purchasing and installing the CDL pre-lashed mainline will save you money and increase short and long-term profitability compared to a traditional mainline, while offering longer durability and a 10-year warranty to boot!

First, install and secure the mainline spool on your trailer. At the installation site, unroll the tubing at the intended location. Thanks to its quality manufacturing, the tubing slides easily over the ground without getting stuck, even on uneven ground. Next, mark off the manifold run using orange tape. The run should be as straight as possible. If you must zigzag between trees, make long sections to minimize frictional pressure against the tree bark while unrolling. If the geography of the terrain requires you to make curves of more than 15 degrees, use an open pulley to protect the pipe from being crushed by frictional pressure during unrolling. Install a clamp on each end of the manifold to hold the wire in place, then attach it to the head as desired. Using a hand winch, stretch the wire to the desired tension. Run the entire length of the manifold and install all required guy wires to support and tighten the mainline. Check and adjust wire number 9 so that it is pointing upwards along its entire length. If the ground has only a slight slope, use a professional quality construction level to check that the minimum slope is met. For long distances between guy



wires, use stakes. With these simple steps, installation of your mainline is complete. It's as easy as that! This easy installation will most certainly save you time and ensure long lasting performance.

**SPINSEAL TECHNOLOGY:
INSTALLS IN UNDER TWO
MINUTES!**

CDL's mainline fusion process is revolutionizing the installation of fittings. Like all CDL equipment, SpinSeal saves you time and money. With the SpinSeal welder, installing fittings on the mainline has never been faster – installation can be completed in less than two minutes.

The SpinSeal fitting fusion process eliminates leaks and guarantees better long-term performance and an unmatched seal. SpinSeal fittings are designed to be compatible with the vast majority of CDL's range of mainlines. Before starting installation in the forest, it is recommended that you conduct calibration tests first. To get started, install a fitting on a small sample of tubing using the SpinSeal welder. A good weld will form a weld bead all around the fitting. You will see a small amount of smoke just before the tool stops. As with all CDL equipment, the instructions in the SpinSeal technology User's Manual will help you confirm that your weld

has been done properly. Please keep this manual and refer to it as needed or contact our team if you have any questions.

Here's how to install your SpinSeal fittings: Take the SpinSeal welder, a charged battery, the fittings and install the drilling template with drill bit on your drill. First, insert the fitting into the welder. Make sure it is fully inserted all the way to the bottom. Position yourself on the mainline at the location of your choice and squeeze the clamp of the welder until you hear a click. This sound tells you that it is properly attached. Once in position, press the green button, keeping your hand on the clamp during the entire welding process. The welding time, indicated by a green light, will be shown first. Allow the required cooling time to ensure proper adhesion. The cooling time is indicated by a blue light, and a beep will sound when done. Then remove the SpinSeal from the fitting at an angle.

Using the drilling template and drill bit, you can now drill the tubing. Keep the drill running throughout the entire drilling process. Insert the drill into the fitting and snap it into place. Make sure to maintain the angle and let the drill bit do the work. Don't worry, the residue will stay attached to the drill bit. And that's it! All you have to do now is attach your tubing to your mainline.

SpinSeal is a 100% fused mainline system, efficient and effective for all types of maple syrup producers. In addition to being an eco-friendly product, it is simple, fast and saves you money on everything.

Ask about these two technologies at one of our branches or contact a representative. Our team will be happy to help you and answer any questions you may have.



By Abby van den Berg¹

Collaboration: Timothy Perkins¹,

Mark Isselhardt², Brendan Haynes¹ and Wade Bosley¹

¹University of Vermont Proctor Maple Research Center

²University of Vermont Extension



TOTAL YIELDS FROM RED MAPLES

Red maples (plaines, *Acer rubrum*) are abundant throughout the maple-producing region of the U.S. and Canada, particularly in southern and midwestern areas. They're able to adapt to diverse growing conditions and climates and can be found everywhere from moist soils and swamps to dry ridges and uplands. Their ability to adapt to and thrive in diverse sites and growing conditions also means that, unlike sugar maple, they're prevalence in forests of the maple-producing region is predicted to increase under future climate change scenarios. Because of this, it's likely to be an increasingly important species for maple production. In addition, maintaining red maples in sugarbushes is one way to help achieve higher levels of biodiversity, a critical factor to support the resilience of these forests to current and future stress.

Many producers include red maples as crop trees without a second thought. And still many others will walk past red maples with a roll of tubing. Why the difference? Much of it arises from some lingering perceptions about red maples – that they produce lower yields or stop running earlier than sugar maples, or produce syrup with inferior flavor or that exhibits buddy flavor earlier than sugar maple. But are any

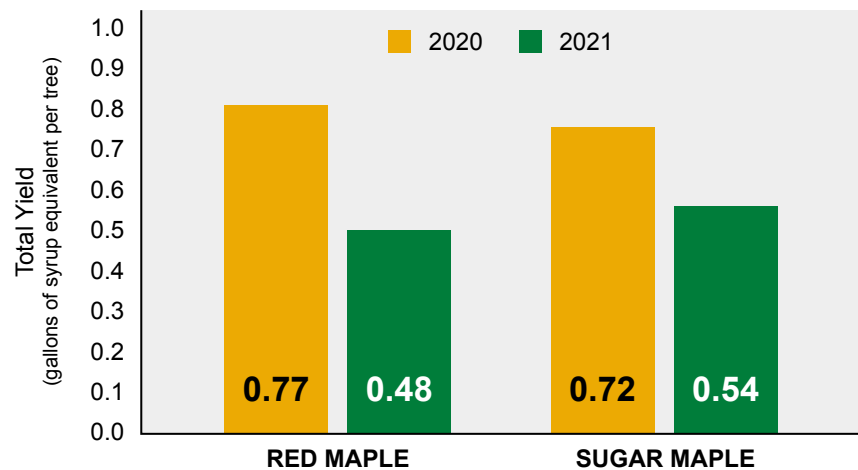


Fig. 1 – Average total syrup yield of red (n=38) and sugar maple (n=35) trees from 9.0 to 16.9 inches in diameter during the 2020 and 2021 production seasons at the University of Vermont Proctor Maple Research Center. Error bars represent standard error of the means. Average yields of red and sugar maples were not significantly different in either 2020 or 2021 (Student's t tests, $p < 0.4796$ (2020), $p < 0.1735$ (2021)).

of these actually true? Most of these beliefs stem from anecdotal observations made with gravity sap collection using buckets, and before the use of RO was common. However, there are actually no scientific data to support these perceptions, particularly with modern collection and processing practices (vacuum, RO, etc.). So because of the many current benefits of including red maple as crop trees and their importance for maple production in the future, we've been conducting research to provide some to fill in some of these gaps in our knowledge. The first step was to investigate the total yields of red maples –

with current collection practices including good vacuum and sanitation, what are the total syrup yields produced by red maple trees across a season, and how does this compare to sugar maples in the same stand? Most of us have probably had some firsthand experience with red maples and their tendency to produce copious amounts of sap, with a lower sugar concentration than sugar maples. But what does this add up to across the whole season?

To answer this, 8-10 healthy red and sugar maple trees in each of 4 diameter classes (9-10.9,

11-12.9, 13-14.9, 15-16.9") in the same stand at the Proctor Maple Research Center (PMRC) were each outfitted with an individual sap collection chamber. Vacuum was applied to the system using a rotary claw vacuum pump equipped with a variable frequency drive maintained between 25-27"Hg throughout the season. Trees were tapped on the same date (2" tapping depth, 5/16" diameter), and sap volume and sugar concentration of each was measured after each flow period until the conclusion of the season. This was determined by when either sap flow ceased, or late-season off-flavor was detected within the PMRC maple operation, whichever arrived first. The experiment was repeated in 2020 and 2021, with new droplines and check-valve spouts each year.

The total syrup yields for red and sugar maples in the 2020 and 2021 seasons are shown in Figure 1. Not surprisingly, the yields for both species were much lower in 2021, which was a low production year for much of the maple region. The yields of red and sugar maples were not significantly different in either year of the study. In addition, sapflow stopped at the same time for both species in both years.

These results indicate that with good vacuum and sanitation, the fundamental yields achievable from red maples are similar to sugar maples. So all things equal, a healthy red maple has the potential to yield the same total quantity of syrup each season as a healthy sugar maple of the same size in the same location. However, it should be kept in mind that there are potential factors that could affect this – for example, some red maples have a large

central column of discolored (nonconductive) wood, which could potentially reduce yields due to less available conductive sapwood in general, or when tapholes are drilled into it. You can find a more detailed discussion of this and other factors that might impact red maple yields, as well as more results from the study, in this presentation on the UVM PMRC YouTube Channel <https://youtu.be/ncnlc3tLBt8>.

So even though red maples had similar total yields to sugar maples in this study, there's still a missing piece of information to complete the picture – flavor. If red maple sap produced buddy syrup earlier, or syrup with some other undesirable flavor attribute, the total yield would no longer be equivalent. We're producing and selling a product based on

flavor, not just pounds of sugar. So we've been investigating this question during the 2022 season, producing syrup simultaneously from pure red and sugar maple sap in identical processing conditions (Figure 2), and will be completing the subsequent sensory experiments with the syrup produced over the next few months to answer some of the questions about the flavor of syrup produced from red maple sap – is it different from syrup produced from sugar maple sap? If it is different, is it less (or more) desirable or preferred? Does it produce buddy syrup earlier? We're looking forward to discovering and sharing what we find.

Acknowledgements

Funding for this work was made possible USDA AMS ACER Access Project AM190100XXXXG069.



Fig. 2 – Maple Processing Research Facility at the University of Vermont Proctor Maple Research Center during an experiment processing pure red and sugar maple sap concentrated to 8%.

By Luc Lagacé

Collaboration: Jessica Houde,
Stéphane Corriveau, Jack Bauer

Collaboration between the Centre ACER and CDL Maple Sugaring Equipment



RESEARCH ON THE EFFECT OF TUBING COLOUR ON MAPLE SAP HARVESTING: THE RESULTS

In last spring's issue of CDL's Way, we discussed a research project on tubing colour, a collaboration between CDL and the Centre ACER. The project was still ongoing at the time, so the results weren't known. Today, we can finally share the main results of this research and discuss the issues surrounding tubing colour.

The colour of the tubing has been of interest to maple syrup producers for a number of years. The reason for this is that a dark material absorbs the sun's rays better and heats up faster than a light material. As a result, it could

help the tubing thaw faster and allow it to start working earlier in the day. On the other hand, it could also promote microbial growth in the sap during the season, leading to earlier degradation. These issues led to questions about whether tubing colour affected sap volumes and quality. Similar studies had been done in the past on spile colour only, but were unable to show an effect on sap volume. The question remained open as to the effect of tubing colour on volume and quality. In order to provide some answers, a project was set up at the Centre ACER's experimental sugarbush.

This project was mainly designed to compare two types of tubing that were identical except for their colours: one was blue (light) and the other grey (dark) (fig. 1).

In this project, a rigorously controlled experimental setup was used to compare both types of tubing. For example, tapping was done in pairs (both tubing types in the same trees) and replicated enough times to minimize the influence of other variables that could distort the findings. In addition, the system was equipped with vacuum and outdoor temperature sensors for the tubing and the sap, as well as calibrated meters to measure the volumes of sap harvested each day. Finally, a sap sampling plan was implemented to monitor sap quality throughout the season.

Overall, the 2021 sugaring season was relatively short, with relatively high outdoor temperatures. Nevertheless, continuous temperature readings of the blue and grey tubing at various locations in the systems showed that the grey tubing tended to reach higher temperatures than the blue tubing. On average, the grey tubing reached a daily maximum temperature that was 1.3 °C higher than the blue tubing (fig. 2).

The differing temperatures of the tubing, however, did not significantly affect the temperature



Fig. 1: Paired tapping system on the same trees, used to compare the blue (light) and grey (dark) tubing

of the sap; the daily maximum temperature of sap collected with the blue tubing was, on average, comparable to that of the grey tubing (fig. 3).

Much like sap temperature, the sap volumes were comparable between the two colours, with an average of about 105 L of sap per tap harvested with each colour of tubing (fig. 4). As for sap quality, measurements of microbial contamination at different points in the season, as well as sugar analyses, did not reveal any difference between the colours. In general, for both colours, the sap was minimally contaminated with no apparent degradation of the sugars.

In sum, this research showed that the tubing colour did not affect sap volumes or microbial degradation, though the grey tubing did have a significantly higher average maximum surface temperature. It should be noted that these results are tied to the specific conditions of the study, i.e., the characteristics of the experimental sugarbush at the Centre ACER (sugarbush with little slope and a relatively high average dbh), a 2021 season characterized by relatively high outside temperatures and a relatively short sugaring season, and the fact that the tubing was new. Significantly different conditions could therefore lead to different results. However, in a sugarbush that has similar conditions to the study, the use of different coloured tubing could be useful to distinguish production sectors without significantly influencing sap volume or characteristics.

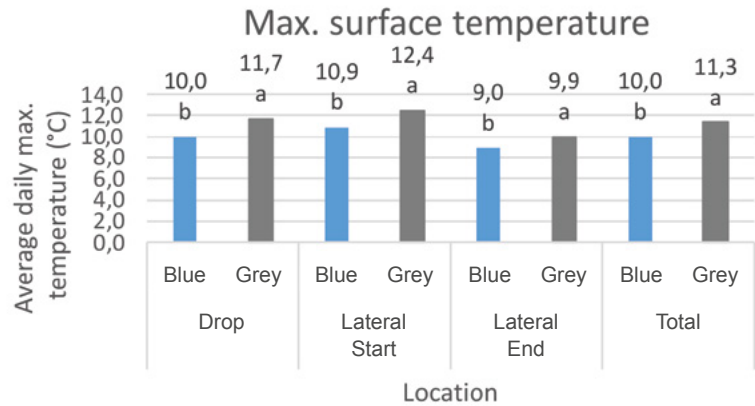


Fig. 2: Average daily maximum surface temperature at different locations in the tubing system. Different letters beside the averages indicate a significant difference ($p < 0.05$).

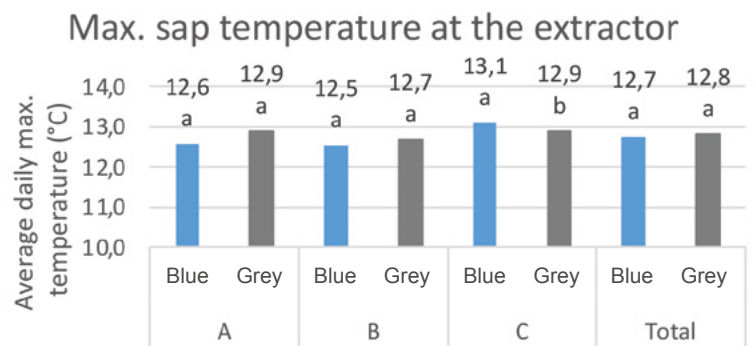


Fig. 3: Average daily maximum temperature of the sap at the extractor for both systems. Different letters beside the averages indicate a significant difference ($p < 0.05$).

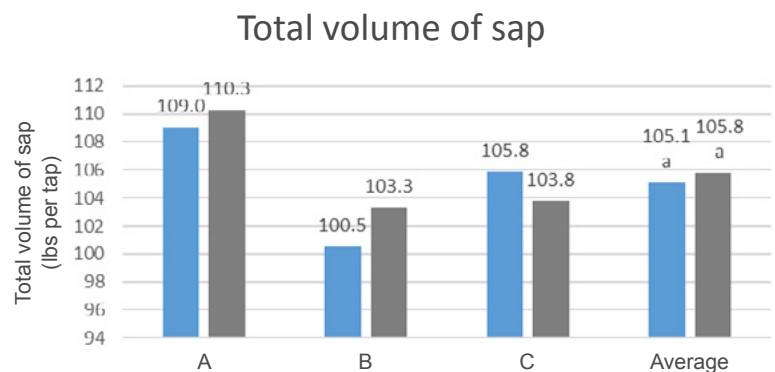


Fig. 4: Volume of sap harvested from the systems with blue and grey tubing. Different letters beside the averages indicate a significant difference ($p < 0.05$).



© Manuel Khulan Poirier

By Jean-Étienne Poirier

Anthropologist and maple syrup producer

THE FLAVOURS OF OUR LAND

As an anthropologist—a specialist in the study of cultural diversity—I have observed various agricultural practices in countries such as Mongolia, Chile, and Switzerland. Since my grandfather was raised to be totally self-sufficient, from producing his own food to crafting his own tools and clothing (for which his family grew flax), I have always been fascinated by people’s ability to produce the food and material goods they need to sustain themselves. This skill has been lost in our modern cultures, where everything is commercially available and there is no need to understand how things are made. My fascination with the know-how of people elsewhere on the planet led to my desire to connect with a local Quebec agricultural tradition; one that provides our first harvest of the year and makes us forget the harshness of our winters—maple sugaring.

In anthropology, the way we discover another culture is to live within it, as what we call a “participant observer.” Similarly, I started my exploration of the world of maple syrup by helping a friend boil down the sap from his 2,000 maple trees in the East Broughton area of Quebec. The day this friend let me load up his boiler with firewood was the day I caught “sugar fever.” And it was at that moment that I realized I would become a maple syrup producer. The intense fire, the bounty of syrup flowing through the evaporator valve, and the darkness of the surrounding



© Philippe Coste

night (made even more mysterious by the steam rising from the sap) transported me into a surreal universe where, strangely, I was travelling through my own culture.

Today I own a small sugarbush in the Tewkesbury mountains, where, along with my father, family, and friends, I run my wood-fired boiler. I can no longer imagine a spring when I don’t gather sap from our maples and boil it down, and when I don’t bring together a group of people to enjoy our first group celebration of spring. This past season has reminded me that maple sugaring involves wearing 50 different hats, often flying by the seat of your pants. It’s a tough job: working in the woods to set up the tubing, getting the firewood ready, and then watching the long boiling sessions. These are definitely not insignificant chores. But you can’t put a price tag on the pride that

comes from personally producing a year’s worth of sweetness for my relatives and a few other families in my social circle.

Maple sugaring brings us into a relationship with a tree that serves us in many ways by giving us woodworking material, firewood, and syrup. But beyond these uses, it has one characteristic that few trees possess: the ability to bring humans together. In northern Europe, and now to a lesser extent worldwide, the balsam fir has been doing this for centuries, as people surround it with gifts to celebrate Christmas. There’s also the baobab, which gives many African communities a place to assemble when they need to find a solution to a common problem. Here, in northeastern North America, it’s the maple that brings us together around its sugary delights, regardless of age or social class. Because sweets

have the power to bring people together around an activity that's a shared source of joy. There's no fighting in the sugar shack!

Maple sugaring is more than just a type of farming; it's a rich cultural experience that keeps traditions and values alive. It has its own vocabulary, its own spring rituals, and its heroes who make amazing amounts of syrup per tap. And while it stems from an ancestral tradition inherited from the First Peoples, it has also become a science, whose advances are made clear during trips to state-of-the-art boiling rooms. Making maple syrup brings together the past and the future; it's also, quite possibly, a practice that can inspire us to find solutions to the new challenges of our time. Is harvesting sap from a sugarbush not the most graceful way of protecting nature over the long term, while still earning a living?

Since becoming a maple syrup producer, I've been going out to our bush much more frequently. I go there in the spring, of course, but also in the summer to plant new maples. In the fall, I wander around to collect mushrooms from the spots I noticed during sugaring season, when I found dried specimens on dead maples. I go there in winter, too, to do maple-related forestry tasks, and to harvest our lumber and firewood. With each passing sugar season, I find that the forest educates me and makes me ever more aware; it reveals its secrets while charming me with its beauty. As a result, like more and more maple syrup producers, I find that our sugarbush energizes me and makes me appreciate the role I can play in ensuring that this paradise remains accessible to future generations. And like a

heroine in a Gabrielle Roy novel, I realize that maple syrup production has certainly changed my view of the forest:

"Now she saw the sugarbush gleaming in the sun! With eyes closed or open, it mattered not: everything had become visible, crystal clear. She could have said it: 'This old tree has been giving sap steadily for six years, that one much less, and that one over there has run for only a few days every spring.' But she could not have told what moved her most: the ground under the trees splattered with sunlight where the snow had melted and left the brown earth bare and flecked with rotting leaves, or the damp trunks of the trees themselves, with the drops of moisture glittering like morning dew..." Translated from *The Tin Flute* by Gabrielle Roy (tr. Hannah Josephson), 1945, p. 137.

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