Maple Syrup Digest

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Drivers of Sap Flow
Alternative to Defoamers for Maple Production
History of Spelling Maple Sirup with an I

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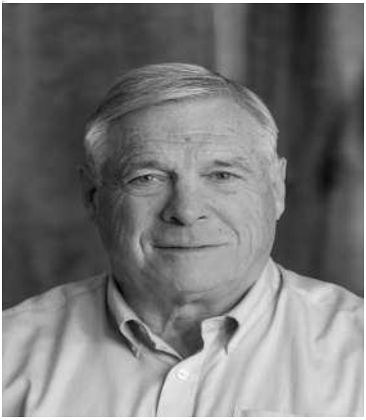

President's Message

Congratulations to Maine for hosting the 2024 Conference. A huge thank you is owed to the organizers and suppliers for making this event a success. The gathering was well attended and provided the chance to renew acquaintances and meet new maple producers. These in-person opportunities foster the transfer of knowledge, and can only benefit our Industry.

After extensive search efforts initiated by NAMSC over the last year, important staffing announcements were made at the conference: Theresa Baroun was named the permanent Executive Director for NAMSC and Kaylie Stuckley was appointed as the Executive Director for IMSI. Both appointees are expected to work closely together in their new positions, building upon continued cooperation and synergy between the group work closely together in their new positions, building upon continued cooperation and synergy between the groups.'

NAMSC and IMSI made a joint presentation at the conference, lauding the benefits of belonging to both organizations. During the conference, the Executive of both organizations met to discuss how their collaborative approach can be developed further in the coming year.

The Conference offered many opportunities for producers to develop their practice. Attendees were given multiple research and education presentations over two days.

The NAMSC Research and Education Committees have seen a recent dramatic shift in process. The historic practice of accepting proposals has been replaced with a strategy of first setting priorities and then seeking proposals to satisfy these priorities. In the case of the Research Committee up to $100k can be awarded annually. Each year, Education Committee initiatives can qualify for $5000.

A new committee has been struck to review the Maple Digest. The review-will consider content material, and investigate ways to increase circulation-and find additional revenue streams.

Another committee has been formed to advance Alliance membership, an to seek support for research within our Industry.

This year saw several individuals recognized for their contributions to the industry. Dr. David Miller was awarded the Richard G. Haas Distinguished Service Award. Hall of Fame inductees were Dave Hamilton and Tim Wilmot.

The NAMSC maple contest had significantly fewer entries (syrup 80) this year, in contrast to previous years, only full registrants were eligible to win awards. The International Grading School was held immediately following the conference, as is the established practice. NAMSC continues to financially support the delivery of this worthwhile educational opportunity for producers Upcoming conference planning is well underway. The 2025 NAMSC Conference will be hosted by Michigan in Port Huron, followed by Ontario's Sault Ste. Marie Conference in 2026, 2027 in Quebec and 2028 in Pennsylvania.

Brian Bainbourgh
NAMSC President

In this issue...

Cover: International Maple Mueseum, Croghan, NY

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We're always looking for good maple photos and articles for the *Digest*. Send to: mapledigest@gmail.com.

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Drivers of Sap Flow in Maple

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Introduction

Sap flow in maple trees has been described many times. Milburn and O'Malley (1984) provided the first well-accepted modern description, which was later modified and improved by Tyree (1984), then further by Cirelli et al. (2008). Stem pressure and flow in maple were then mathematically modelled in detail by Graf et al. (2015) with additional refinements and comparison with field-derived measurements by Zarrinderakhta et al. (2024). While these articles provide extensive detail into the anatomy and physiology of the science of the sap flow mechanism, they are somewhat unavailable to most people. A good general description of the sap flow mechanism is described in more modest detail in the Third Edition of North American Maple Syrup Producers Manual (Perkins et al. 2022), so won't be discussed at length here. Rather, this article is aimed at describing pressure gradients and the sources and magnitude of those pressures as they related to sap exudation from maple tapholes.

Gradients in Pressure Cause Sap Flow

Sap flow within maple stems and from tapholes occurs in response to various gradients of pressure within the tree xylem. At the simplest, a gradient is a difference in pressure from one area to another. An example can be useful to help explain gradients and liquid flow. In the case of a stream, water flowsdownhill in response to an elevational gradient (gravity). If the hill is steep, water will flow quickly. If less steep the water flows slowly. If the stream is large, more water will flow. A small stream will only contribute a small amount of liquid. We can change the direction of water movement if we use a pump to create a pressure gradient that pushes the water uphill against the downward (gravitational) force. Whichever way you manage to do it, water will flow in the direction of the pressure gradient, from areas of high pressure to areas of low pressure. The amount that moves depends on the size of the pressure gradient and the carrying capacity of the system (big stream, small stream). In a sealed system where you can't increase the size of the stream, liquid under the same pressure gradient will move faster through a small pipe than it will in a large pipe.

In the case of maple sap exudation 1 , a gradient is the pressure difference from a particular area in the tree to the area of the taphole. The gradient is important since it establishes both the direction and rate of flow of a substance, in this case sap. In this paper we will describe the primary factors important in establishing gradients, how they form, and how they change within a maple stem under different conditions.

1. For this sake of simplicity and length, we restrict this discussion to the sap exudation (thaw) phase of maple sap flow only. The uptake (freeze) phase has some similarities, but also some crucial differences, and is not discussed here.

A Confusing Variety of Pressure Measurements

There are several phenomena which give rise to the pressure gradients in maple stems. Unfortunately, maple producers tend to use a variety of units to describe pressure. For pressure within the stem, PSI (pounds per square inch) is generally used. For osmotic pressures, producers might use PSI when they're conversing about RO systems, but °Brix or % sugar might also be used when talking about sap sugar content. For producers using vacuum, inches of mercury (Hg) are common, but the negative sign is generally ignored, but implied. Barometric (air) pressure is typically expressed in millibars. Temperature can also create pressure differences in a closed system (like within the gases found inside of tree fibers), so °F or °C are used. Lastly, another complication is that some of those scales use a fixed value as the starting point in the case of absolute units, or can use a point relative to some starting value as in the case of tree stem pressure or vacuum level. This is referred to as gauge pressure and uses air pressure as the starting value. However, air pressure itself is not fixed, so the reference point is constantly shifting a little. When vacuum is used it can become confusing. Vacuum is generally thought of as negative pressure in terms of our scale relative to air pressure, but it is really just a lower point along a continuous pressure system. All these things together make talking about sap flow a bit more complicated.

To simplify things, Figure 1 shows the major contributors to stem pressure in maple trees. These include: tree height, vacuum, temperature rise, weather, and osmotic variables. More importantly, these are all expressed in this chart in common units of inches of water. We can all picture quite simply what an inch of water in a column looks like. Expressed in this way we can more easily explain and understand what contributes to gradients, the direction that sap is moving (from higher values towards lower values), how those factors might change over the course of a sap run, and how fast sap might move in response to the gradient (the magnitude of the pressure difference across the distance involved and the resistance encountered in moving).

Factors Giving Rise to Gradients that Contribute to Sap Flow

Tree height is important because it cre ates a gravitational (or elevational) gradient in the tree. Unless restrained or acted upon by other forces, sap will flow down within the wood during the dormant season during a thaw. The magnitude of the gradient is dependent upon the tree height. If a tree is 85 feet tall, the gradient would be close to 80 feet of water if the taphole were placed at 5 feet above the ground (Figure 1). Most of that flow occurs within the tree vessels and is primarily downward since vessel elements within maple xylem are oriented vertically. While these vessels are quite small, they are considerably larger than the surrounding fibers and are mostly open on the top and bottom (or have pits/sieve plate openings between vessel ends) and have lots of interconnections between them. Therefore, the vast majority of sap moving through xylem takes place in the vessels. As the tree comes out of the frozen state, the weight of the sap will push downward. If there is a hole in the wood, sap will flow downward and out through that hole in response to this pressure. The pressure is higher within the stem than air pressure is in the taphole and outside the stem. Because there is some resistance to flow through wood (even in vessels), and only a reasonably small number of vessels is severed by a taphole, the sap doesn't spray out, but drips out of the severed vessels. One key factor of gravitational flow is that it is not constant. Sap flow will be fastest immediately after the tree thaws because the pressure is initially high. As the vessels drain, the pressure in the stem and the rate of flow of sap will fall. It may take a few days for sap to fully drain from the top of the branches all the way down the stem and out of the taphole, but eventually the pressure due to the gravitational gradient will fall to close to zero and sap flow will cease unless some other factor is involved.

As gravitation flow occurs, most of the sap movement will be downward. However, because of the interconnectedness of vessel elements, there will also be some bulk flow of sap sideways. Since vessels are oriented vertically, sap movement sideways occurs primarily within and along the cell walls of fibers. The resistance to sap flow sideways is about ten times that of downward flow, so not all the sap above the taphole in a tree with gravity sap collection will flow out, but the majority will if the thaw continues long enough.

If **vacuum** is used to assist in sap collection, another pressure gradient comes into play. This gradient artificially lowers the pressure outside the tree. Therefore, the pressure at the start of a sap flow period will be the pressure due to the height of the sap column in tree plus the pressure of the vacuum below air pressure. For a vacuum level of 25 inches Hg, this equates to about 28 ft of water. Therefore, when the tree first thaws, the total gradient would equivalent to 108 feet of water (80 ft due to tree height + 28 ft due to vacuum). Given the higher pressure gradient pushing down towards the taphole without any change in the number or diameter of the wood vessels, the sap flow rate out of the taphole will be higher for collection with vacuum than under purely gravity flow conditions. Sap will more strongly be pulled through the stem due to the higher gradient towards the taphole.

Measurements of stem pressure of trees connected to vacuum lines clearly show that stem pressures are affected across the entire circumference of even large trees during extended thaws, indicating that flow of sap occurs across the stem. How much this happens depends on the magnitude of the gradient, previous wounds/compartmentalized areas in the stem, heartwood/sapwood distribution, and the extent of thawing during a flow period. Eventually, when the gravitational pressure component, downward, and across-stem flow of sap is close to being exhausted, the vacuum pressure component continues (as long as the pump stays on) and sap flow will continue. At this point, bulk flow of sap will transition to moving upward in the stem from below the taphole. If vacuum is good enough, sap flow can continue indefinitely as long as there is adequate soil moisture. In essence, water will be pulled directly out of the soil into the roots, up the stem, and out of the taphole. During this phase of sap flow, sap sugar content will steadily drop and some producers may decide to stop sap collection.

Besides the strong gradients created by tree height and vacuum, there are a few other pressures that can come into play at various times. These all tend to be small, but are large enough to be noticeable at times.

Temperature rises that occur during and continue after the transition from freezing to thawing cause expansion of gas bubbles in wood fibers and vessels as well as thermal expansion of sap. For example, a change in temperature from 32°F to 52°F during a sap flow event would result in the pressure equivalent of about 1.7 feet of water. Although small relative to the pressure gradients related to tree height (gravity) or vacuum, this change is enough to produce "weeping flows" when the temperature rises above the previous day's temperature. The higher temperatures cause gases in the wood to expand creating (slightly) higher stem pressure. As long as temperatures continue to increase in succeeding days, these types of slow flows can continue. If temperatures stop reaching new highs, the weeping flow of sap will greatly diminish or stop.

Similarly, changes in **weather**, more particularly barometric air pressure, can result in an increase in pressure and small increases in sap flow under certain conditions. This effect is quite small, only on the order of about 0.7 feet of water of pressure, but can again produce noticeable increases in sap flow similar to that created by temperature rise if the change in barometric air pressure is high.

Lastly, **osmotic** forces can alter the pressure gradient and result in movement of sap. In general, sugar loading (which produces osmotic pressure) tends to be fairly minor and diffuse in maple stems, and thus does not result in any particular directionality to the gradient. In terms of magnitude of osmotic effects, it could produce a pressure up to about

1.5 feet of water, but that would only be in extreme cases. This phenomenon would mostly be found high in the branches of the trees. Sugars are produced by the leaves in the crown, with the result that more sugar is stored in wood higher up in the tree than lower in the stem. The overall effect would be simply to increase pressure high up in the crown where it adds to the gravity effect. Regardless, while osmotic effects are less well understood than other forces, sucrose does seem to be very important in generating stem pressure overall in maple trees, but less so as a driver of sap flow towards tapholes.

Summary

An understanding of how pressure gradients form in maple, the factors that generate these gradients, and the magnitudes and directions of these forces helps maple producers to understand how sap flows under various conditions during the spring season. This knowledge, in turn, helps in the formulation of tapping guidelines, in the development of better sap collection methods and devices, and influences other management decisions in maple operations. The goal is that scientists, equipment designers and manufacturers, and producers can use the developments in our understanding of the driving forces in sap flow to generate good sap yields.

Acknowledgements

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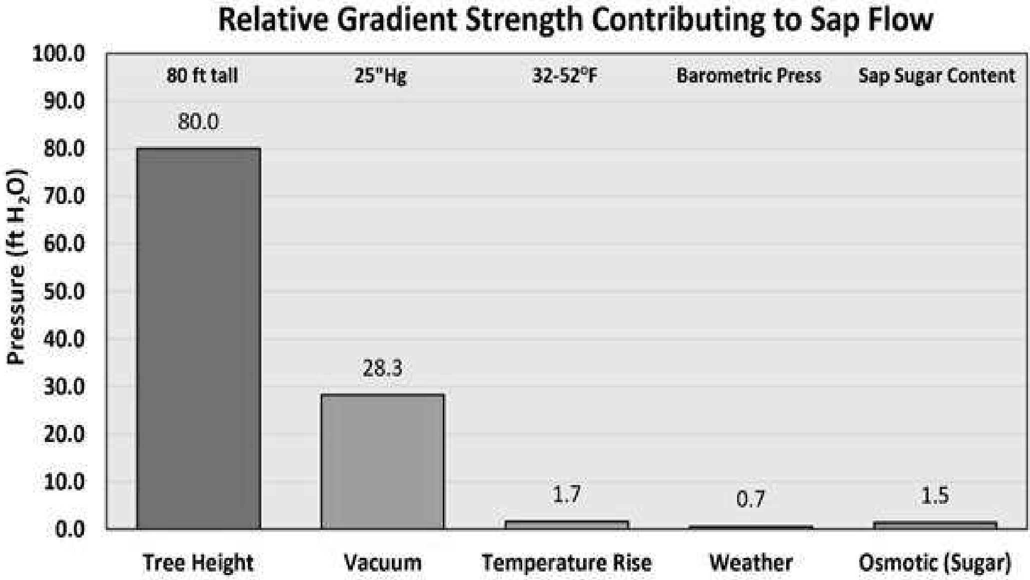

Figure 1. Sources of pressure gradients that can contribute to sap flow from tapholes in maple stems during the leaf-less spring sap flow period. All pressures have been converted to a common unit, ft of H2O to allow a better comparison of the magnitude of the pressure. Note that although Tree Height is the largest contributor to the pressure gradient at the start of a sap run, this pressure drops off as flow happens, eventually reaching close to zero during an extended sap run. Vacuum pressure is shown at 25 inches Hg within the tubing system near the taphole. Temperature rise is from 32-52°F.

A Promising Alternative to Defoamers for Maple Production

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In North America, the sap of maple trees is collected in the spring to be processed into maple syrup. During the harvesting period, the composition of the sap will change depending on many factors such as the metabolism of the trees and the action of microorganisms that colonize the collection tubing system and processing equipment. Sap is composed of several organic and inorganic compounds such as sugars, organic acids, phenolic compounds, amino acids, and minerals (Perkins et al., 2006; Perkins and Van den Berg, 2009; Lagacé et al., 2015). Their presence in higher concentrations, combined with a higher load of microorganisms towards the end of the season (Lagacé et al., 2015), makes the sap more prone to excessive foaming and overflow when boiled for syrup production.

Foam development in the evaporator is a phenomenon often encountered in maple production (Martin, 2011). As it passes through the evaporator, the boiling sap can begin to foam quickly, especially at a later stage of the production season. When excessive foaming occurs, the use of a foam control agent, commonly called "antifoaming agent" or "defoamer" in the maple syrup industry, sometimes becomes necessary to avoid problematic overflows (low productivity, loss of product, cleaning challenges, safety, etc.).

Foaming is not exclusive to maple production, and the use of defoamers is generally of technical and economic interest in the food industry, as they are inexpensive, effective, and easy to use (Bensouissi, 2007). Defoamers are considered food processing aids in maple syrup production and are currently tolerated in the industry under certain conditions, given the strict standards governing the purity of maple products. Only trace amounts of defoamer should be used during the production process and only when really needed. Although this type of intervention significantly reduces the quantity of defoamer added, the maximum concentration allowed for a processing aid can easily be exceeded when important foaming occurs, leading to quality problems. This is particularly problematic for organic maple productions, which require that certified organic products, mostly cooking oils (safflower, canola, and sunflower), be used as defoamers. These oils are not strictly speaking defoamers and are much less effective (Martin 2016 and 2017 a,b; Van den Berg, 2020). The quantity added is therefore often excessive, leading to quality problems such as an oily texture and off-flavors.

In this context, the development of a foam control technique that does not require the use of a defoamer is an interesting way to maintain and ensure the purity of maple syrup. The aim of this proof-of-concept study was therefore to develop and test a system to control foaming in maple syrup production that is efficient, easy to use, and inexpensive, and which does not require the use of defoamer.

ANTIFOAMING PROTOTYPE DESIGN

The work conducted in this proof-of-concept study aims to evaluate the potential of an alternative method for controlling foaming in a maple syrup evaporator. But in order to do this, we had to investigate the basic concept behind foam formation and put it in the context of maple syrup production. In summary, when a liquid is heated, the energy supplied raises its temperature until it reaches the boiling state. During boiling, the liquid undergoes a transition to the gas phase; saturated vapor bubbles form and rise to the surface (Blander, 1979). If the liquid, such as a maple aqueous solution, contains surfactant molecules, like sugars, amino acids, proteins and protein fragments, these will be adsorbed at the gas/liquid interface to lower the surface tension (Bensouissi, 2007; Drenckhan et al., 2015). The vapor bubbles are then "trapped" and the foam is created (Garrett et al., 2014; Drenckhan et al., 2015).

Foams are desirable in several food and cosmetic applications, in hygiene and cleaning products, in pharmaceuticals, etc. In other applications, foaming is detrimental and must be controlled. To avoid the addition of a defoamer, mechanical devices have been developed in other industries. Of these, the most widely used is a rotating device equipped with disks or various arrangements of rotating blades. The main disadvantages of their use are their high operating costs, complex design and limited effectiveness (Vardar-Sukan, 1992 et 1998). When foaming is excessive and intense, they must often be used in combination with a defoamer.

In our previous studies, some of these techniques were adapted and tested in laboratory-scale experiments to evaluate their potential to control foaming in maple syrup production (Martin et al., 2017a). These involved spraying water, applying a jet of compressed air or using a rotating device. In all cases, the boiling was so intense that it was not possible to effectively control the foam with these techniques. Further work led us to the development of a new device, the proposed prototype, which uses the circulation of cold water to control foam formation.

The prototype was made of stainless steel SS316 piping network designed to provide the best possible surface coverage in each pan without affecting the evaporation process (Figure 1). This food grade steel material was chosen for its high resistance to acids, alkalis, and chlorides (such as salt). The height of the prototype above the liquid was adjustable. The flow of liquid passing through the pipes (potable water) could be controlled for each pan individually and was activated only when needed. The device operates in a closed system (Figure 2) and there is no direct contact between the circulating fluid of the device and the sap. The device was equipped with a cooling tank (with agitation) to maintain water at targeted temperatures, a flow meter, to evaluate the volume of water used during the tests, and temperature sensors to evaluate the heating of the water in the prototype after circulation in the evaporator.

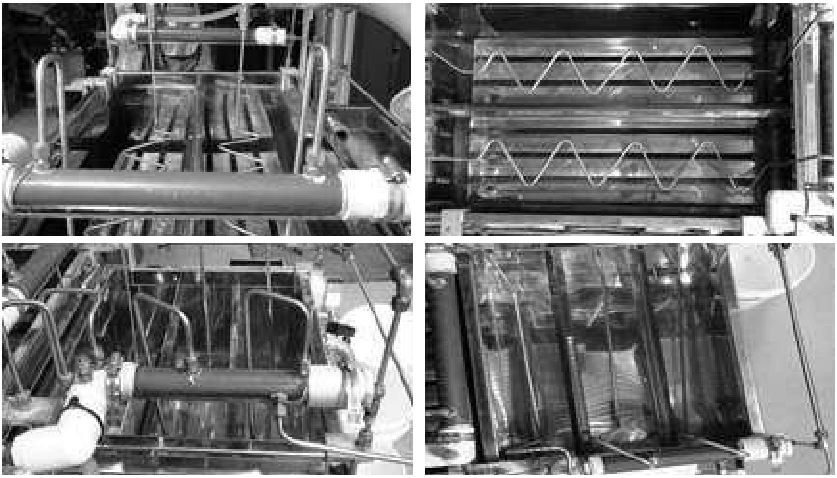

Figure 1. Design and layout of the prototype in the evaporator (top: sap pans; bottom: syrup pans).

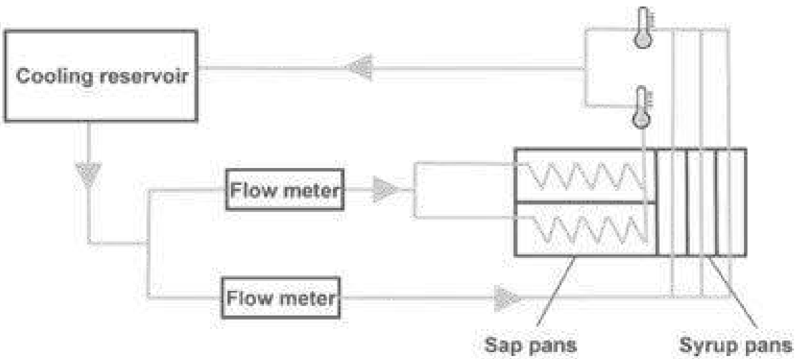

Figure 2. Diagram of the water supply circuit of the prototype during testing.

EXPERIMENTAL DESIGN AND TESTS

Concentrated sap

Sap from Centre ACER sugar bush (Saint-Norbert-d'Arthabaska, Québec, Canada) was collected at the end of 2017 and 2018 sugaring seasons to ensure foaming material during syrup production. The sap was concentrated at 15 oBrix and kept frozen at -18oC until needed. Sap was preheated to 70oC before treatment in the evaporator.

Maple syrup production

A small commercial-scale 19 in. x 48 in. evaporator (2 sections sap pan, and 3 sections syrup pan, Mini-Pro evaporator, Les Équipements Lapierre, Québec, Canada) placed on propane stoves equipped with height 30 000 BTU burners was used for the experiments. Evaporator settings were optimized to promote excessive foaming (near overflow) and monitored to ensure they were the same for each experiment so that the tests were comparable. The level of sap was maintained at 2 in. in the sap pans and 2 in. in the syrup pans. Production parameters (e.g., evaporation rate) were continuously monitored. The syrup was filtered at the end of each test, and samples were placed in a freezer until further analysis. The equipment was cleaned between each test. A total of 11 productions (n=7 with 2017 sap and n=4 with 2018 sap) were carried out with the prototype in different conditions of use. No defoamer was used during testing with the prototype. Two (n=2) control tests were conducted with a defoamer.

Control tests with defoamer

The efficacy of the prototype to control foaming was determined by comparing it to a defoamer. Two tests were carried out under the same production conditions, but where foaming was controlled only with Atmos 300K (Corbion), a commercial liquid defoamer commonly used in the maple industry. The liquid defoamer was used in the following two modes:

-Adding the defoamer manually and in the smallest quantity possible to control foaming at the predetermined marked height of 2 in. above the liquid in the sap pans and 1 in. in the syrup pans (n=1 production).

-Adding the defoamer in continuous mode using a peristaltic pump-type automatic liquid defoamer dispenser at a rate of 4 mL/h (not recommended). The device was installed in the sap pan according to the manufacturer's recommendations and defoamer was added manually in the syrup pans as needed (n=1 production). This test was done to completely avoid the formation of foam and to allow evaluation of the extent to which the presence of foam influences the process.

Prototype operation

The operating parameters of the prototype during testing are described in Table 1. They were chosen to represent extreme conditions in order to test the limits of the process.

Table 1. Experimental operating conditions of the prototype during testing

	Sap pans	Syrup pans
Height of the prototype above the liquid*	0.5, 1, 2 and 3 in.	0.5, 1 and 3 in.
Water flow rate in the prototype (low and high flow)	168 and 480 L/h (44 and 127 gal US)	135 and 384 L/h (36 and 101 gal US)
Water temperature in the prototype	4, 12 and 20 ºC (39, 54 and 68 ºF)	

*A height of 3 in. in the sap and syrup pans did not allow for good control of the production process. Therefore, this trial was excluded from the study.

Analysis

For the prototype performances, many parameters were followed such as the temperature and volume of circulating water into the prototype as well as processing rate, syrup draw-off and evaporation rate.

Each maple syrup produced was sampled and analyzed for its soluble solids content (oBrix), pH, conductivity, color (light transmittance at 560 nm), and flavor. Maple syrup flavor was evaluated by certified inspectors at ACER Division Inspection Inc. using the standard classification protocols and criteria used for bulk maple syrup quality control in Québec.

RESULTS AND DISCUSSION

Tables 2 and 3 respectively present the total volume of water used during the tests and the temperatures measured during the operation of the prototype. As seen in Table 2, the total amount of water per test required to control the foam level to the desired target is relatively high, even at low water flow, hence the need to operate in a closed system. The prototype was put into operation in the sap pans at the very beginning of each test when the foam reached the overflow point. In the syrup pans, the system generally had to be activated just before the first maple syrup draw-off to control the foam level to the desired height. The heating intensity in the evaporator was so high, and the quality of the sap was so prone to foaming, that the prototype had to be kept running continuously in both types of pans until the end of the tests. No defoamer was needed during testing with the prototype. Table 3 shows the temperature of the water circulating in the prototype during the tests. As expected, the water heats up and the warming was slightly higher at the sap pans exit. In general, the warmer the water enters the device, the warmer it will come out, maintaining the same defoaming effectiveness. The difference between the water outlet and inlet temperatures was also influenced by the flow rate and height of the prototype (not shown). The conditions that favor greater heating of the water in the prototype are a low flow rate and a lower height of the device. This would need to be confirmed with further tests.

Table 2. Average total volume of water used in the prototype during the tests

Water flow	Total volume of water (L/test)	
	Sap pans	Syrup pans
Low (168 and 135 L/h; n = 6)	619 ± 45	350 ± 23
High (480 and 384 L/h; n = 4)	2 061 ± 267	1 084 ± 133

Note: The data presented are an average of all conditions of use of the prototype and defoamer, and not of actual repetitions.

Table 3. Average temperature of the water circulating in the prototype during the tests

Targeted temperature	Measured temperature (°C)			Temperature increase (°C)	
	Inlet	Outlet Sap pans	Outlet Syrup pans	Sap pans	Syrup pans
Trials at 4 °C (n = 2)	4.8 ± 1.8	15.7 ± 2.7	12.9 ± 3.1	10.9 ± 4.5	8.1 ± 4.9
Trials at 12 °C n = 4)	12.6 ± 1.1	24.1 ± 3.4	20.0 ± 2.2	11.5 ± 4.0	7.4 ± 3.0
Trials at 20 °C n = 4)	20.0 ± 0.1	31.7 ± 4.7	28.8 ± 2.4	11.7 ± 4.7	8.8 ± 2.4

Note: The data presented are an average of all conditions of use of the prototype and defoamer, and not of actual repetitions.

Foam control efficacy

Evaporator operating parameters have been adjusted to promote excessive foaming. In Figure 3, the left panel shows the sap pans at the beginning of a trial before putting the prototype into operation: foaming is at the overflow point. The right panel shows that the foam level drops as soon as water begins to circulate in the prototype. This effect was observed under all operating conditions of the prototype in this study (regardless of water temperature and flow rate or height above liquid). In all cases, the foam was never eliminated, but its level could be maintained at the targeted height.

Figure 3. Effectiveness of the prototype to control foam formation in sap pans (left: prototype off; right: prototype on).

Although some subtleties may remain to explain the mechanisms underlying the control of the foam by the prototype, hypotheses can already be put forward based on empirical observations and the available scientific literature. The observed effect seems to be highly related to the temperature difference between the vapor contained in the gas bubbles and the "cold" air around the tube. This "thermal shock" phenomenon may cause part of this vapor to condense, creating a vacuum that deforms the bubble and causes it to implode. This will then cause the structure of the underlying foam bubbles to rupture (Yanagisawa and Kurita, 2019). The thermal shock phenomenon proposed may be similar to the "water hammer" observed in steam circuits or in pumping systems under the effect of cavitation (Farajisarir, D. 1993; Feng et al., 2000). When vapor suddenly condenses on contact with a lower temperature liquid in the pipes, its volume is instantly and violently reduced.

Effects on syrup Production

Table 4 presents some of the results obtained for production parameters evaluated during the tests. Overall, we observed a slight slowdown of the production process with the use of the prototype (e.g., longer production time, lower evaporation rate) compared to the defoamer. This is probably due to a slight cooling effect of the sap in the evaporator caused by the prototype.

Table 4. Production parameters

	Defoamers (n=2)	Prototype (n=10)
Processing rate (Imperial gal/h)	7.66 ± 0.68	6.13 ± 0.40
Syrup draw-off (Imperial gal/h)	1.69 ± 0.12	1.06 ± 0.14
Evaporation rate (Imperial gal/h/pi^2)	0.36 ± 0.05	0.30 ± 0.02

Note: The data presented are an average of all conditions of use of the prototype and defoamer, and not of actual repetitions.

Although the results obtained with the prototype are relatively similar for all conditions of use, it is possible to identify general trends. A low foam level allows for better control of the evaporation process. The settings of the prototype that seem to show the closest performance to the manually added defoamer are:

- Height of the prototype above the liquid: 1 in. in both sap and syrup pans.
- Water flow rate in the prototype: 168 and 135 L/h in the sap and syrup pans respectively (low flow)
- Water temperature in the prototype: 20°C

Maple syrup quality

Besides the fact that the sap at the end of the season generally produces lower quality syrup, the quality of maple syrup was relatively similar in all tests except for color. The syrup had a lower transmittance (darker syrup) with the prototype (36.1 ± 1.4%, n=7 sap 2017) compared to the defoamer added manually (40.2%, n=1 sap 2017). This is in agreement with the slowing down of the evaporation process observed with the prototype. The major effect on the maple syrup flavor was observed while using the defoamer in continuous mode. An off-flavor and a greasy texture related to defoamer were detected.

CONCLUSION

The aim of this project was to develop a system to control foaming in maple syrup production that is efficient, easy to use and inexpensive, and that does not require the use of a defoamer. This proof-of-concept study showed that it was possible to control foaming by circulating a cool fluid through a network of stainless-steel pipes placed above the boiling sap in the evaporator pans despite a certain slowdown of the process. These results were obtained even though extreme conditions (low quality sap and high evaporation temperatures) were used in our trials. Different results are therefore to be expected in different operation conditions.

Thus, more work is needed to optimize the system, and the integration of the process into maple syrup manufacturing operations is required (e.g., preheating the sap or R.O. filtrate for equipment cleaning, use of heat exchanger). It is important to emphasize that this promising technique preserves the purity of maple syrup, as nothing is added to the sap or sap concentrate during processing. Centre ACER is interested in continuing its development.

ACKNOWKEDGEMENTS

We thank the maple advisors of the Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec for their advice and support in this work. This research was supported in part by a grant from the Ministère de l'agriculture, des pêcheries et de l'alimentation du Québec and by Centre ACER.

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A New Chapter at Proctor Research

Tim Rademacher

Taking on the role of Scientific Director at the Proctor Maple Research Center (PMRC) is both an incredible honor and a humbling challenge. As I reflect on the legacy of PMRC, I am struck by the profound impact that PMRC has had on the maple industry. For nearly eight decades, PMRC has been a cornerstone of innovation in the maple community. Under visionary directors like Dr. Timothy Perkins, the center has delivered groundbreaking advancements, from improving tapping practices to studying the long-term health of sugar maples. Earlier pioneers like Dr. Mariafranca Morselli laid the foundation for understanding the intricate effects of wood anatomy on maple sugaring. Her groundbreaking work continues to inform our understanding of the processes behind sap production and the impact of environmental factors on syrup quantity. These are just two of the many people that have passed through PMRC and left a legacy. Building on this legacy is both inspiring and daunting, as I feel the weight of responsibility to honor these achievements while leading PMRC into a rapidly changing future.

This transition in leadership at PMRC comes at a pivotal moment. While the maple industry continues to grow rapidly, fueled by evolving practices and increasing demand, it faces significant challenges. Global change, a need for education and outreach has not kept pace with the industry's upward trajectory. To fulfill PMRC's role as a leader, we must build capacity to meet these demands and provide the tools necessary for a thriving, resilient maple community.

Over the past two months, I've dived into this new role with enthusiasm, supported by my colleagues, the University of Vermont, and the broader maple community. Engaging with stakeholders has been a priority, and their insights have reinforced the importance of listening, collaborating, and aligning our efforts with the needs of producers and the environment.

Moving forward, our research agenda will focus on four key areas: (1) sustaining ecosystem health in the face of global change, (2) understanding tree physiology, (3) innovating sap collection and processing, and (4) enhancing product identity and quality. Along these axes, we will study sugar maple responses to changing climates, invasive species, and human interventions to ultimately provide tools for sustainable forest stewardship. Ongoing research will also address how evolving practices, and environmental changes affect sap flow and tree health. Collaborating with equipment manufacturers and producers, we will enhance efficiency, sustainability, and economic viability through new technologies and methods. And finally, by studying flavor profiles, quality control, and product differentiation for maple sap

derived products, we aim to support producers in maintaining and growing the global reputation of maple products. These efforts will require long-term monitoring, novel approaches, and strong partnerships with the maple community to ensure that our research is impactful and actionable.
Education is another cornerstone of our mission at PMRC. To address the growing need for skilled professionals in the maple industry, I am starting by designing a new course at the University of Vermont. This course will integrate the latest research on maple ecophysiology, engineering, and sustainable practices with hands-on experience in our sugarhouse. In the future, we aim to broaden these offerings to include certificates, workshops, and trainings tailored to different audiences, from students to producers. The long-term goal is to build a robust pipeline of talent, ensuring that the maple community has the skilled workforce it needs to continue thriving. These efforts are not just about knowledge transfer but about inspiring the next generation of leaders and innovators in the maple community.
The third and final pillar of our mission is outreach. With the help of UVM Extension, PMRC will work to bridge the gap between academic research and practical application, ensuring that the knowledge we generate reaches those who can benefit most. Strengthening partnerships with organizations like the Vermont Maple Sugar Makers' Association and building new connections will allow us to engage a broader segment of the maple community. By collaborating with underrepresented groups and honoring the cultural heritage of maple sugaring, we aim to ensure that this tradition continues to thrive for everyone connected to it.
I am acutely aware of the big shoes I'm filling. My predecessors set an incredibly high bar, and satepping into this role while also juggling additional responsibilities has been challenging. However, the support I've received from PMRC's dedicated team, and the broader community has been invaluable. I believe PMRC has a unique opportunity to lead not only in research but also in fostering a resilient, inclusive maple community that stewards increasingly large swaths of land. By building on our history of excellence and embracing today's challenges, I am confident we can position PMRC as a pivotal institution for the future of maple sugaring—locally, regionally, and globally. Together, we can meet the challenges ahead and create a future where the maple community and the ecosystems we steward flourish for generations to come.

The History of Spelling Maple Sirup with an "I"

Matthew M. Thomas

Readers of vintage United States Department of Agriculture reports, bulletins, and manuals often notice and wonder why the word syrup in maple syrup is spelled as sirup with an I. Where did this version of the spelling come from, how long was it in use, and why was it used in the first place? Was it merely a colloquial variation stemming from people writing spoken words down in ways that phonetically made sense?

Did we get sirup with an I from a language other than English? We know the English language is made up of words from a variety of languages and borrows and modifies all sorts of foreign" words. French is an important language to consider in this regard, especially with the history of maple sugar and syrup making in French speaking Québec. In French, the spelling is sirop with an I and an O. That certainly is a contender for getting from sirop to sirup to syrup. Interestingly, the German spelling for syrup is sirup with an I, which is also right on the mark. Were immigrants and residents with French or German heritage the source of spelling sirup with an I?

Looking further back in American history, how popular was spelling sirup with an I in early America? A search of newspaper archives shows sporadic use of spelling sirup with an I throughout the first half of the 1800s, before increasing in use in the 1850s to the 1890s. However, newspapers rarely used sirup with an I, compared to syrup with a Y, and even then, in most cases, sirup with an I was usually only used in reference to sorghum or cane syrup. So where did the formal use of sirup with an I come from?

The most prominent place to find the use of sirup with an I was in the documents of the United States Department of Agriculture. Perhaps we should look there. The Department of Agriculture was created in 1862, and in 1863 it published its first Report of the Commissioner (the Agriculture Department was led by a Commissioner at that time, not yet a Secretary). That first annual report of the Department included a section titled The Manufacture of Maple Sugar authored by C.T. Alvord, of Wilmington, Vermont. Alvord was not an employee of the federal government, but rather a lawyer, progressive farmer, and regular contributor to farming and agricultural journals of the time. In analyzing federal agricultural census data, Alvord's 1862 report spelled maple sirup with an I, specifically stating, "It will be noticed that the proportional increase in the quantity of maple molasses manufactured in 1860 over that of 1850 is much larger than that of maple sugar. I attribute this to the fact that many farmers are making "maple sirup" instead of maple sugar. At present prices it is thought to be more profitable to make sirup than sugar."

It is curious that in the first instance where Alvord used the words "maple sirup" in the agricultural department report, the term is presented in quotation marks, as if it is a new or unique spelling to be noted, but then then quotation marks are dropped in the rest of the report. Alvord's use of sirup with an I in the government report is especially interesting, since in other articles he wrote on maple sugaring published in agricultural newspapers from just two years earlier, he always used the spelling of syrup with a Y. Similarly, in 1905 when William F. Fox co-authored the Department of Agriculture Bureau of Forestry Bulletin No. 59 titled, The Maple Sugar Industry, the text of the report exclusively used maple sirup with an I. This is in contrast to Fox spelling syrup with a Y a few years earlier in 1898 in his overview of maple sugaring in the 3rd annual report of the Commissioners of Fisheries, Game and Forests of the State of New York.

The Government Printing Office (GPO) was the agency responsible for the preparation and printing of official publications of the federal government, including the Department of Agriculture. Interestingly, the GPO came into being in 1861, one year before the Department of Agriculture. With the monumental task of being the federal government's publishing house, it is safe to presume someone at the GPO was making editorial, style, and printing decisions, including deciding to use sirup with an I.

The first official GPO style manual was issued in 1894. In that manual under the heading of orthography, authors were instructed to follow Webster's International Dictionary, which was an expanded version of the famous Webster's American Dictionary of the English Language first issued in 1806. Following that direction and looking at the 1890 and 1900 editions of Webster's International Dictionary of the English Language we see that sirup with an I was the preferred spelling, and syrup with a Y as a secondary spelling. In fact, in the 1890 and 1900 versions of Webster's dictionary, syrup with a Y does not even have its own entry or cross reference to sirup with an I. Looking at earlier versions of Webster's dictionaries, we see that sirup with an I was identified as the preferred spelling over syrup with a Y as far back as 1828.

Although the GPO did not publish a style manual until 1894, the GPO's written direction from their 1894 style manual was likely formal codification of standards that had been put in place years before. Moreover, since at the time, Webster's dictionary was THE go-to and standard reference for American English, it makes sense that from its very beginning of the GPO in 1861, it chose to follow the spelling preferences presented in Webster's dictionary, namely sirup with an I.

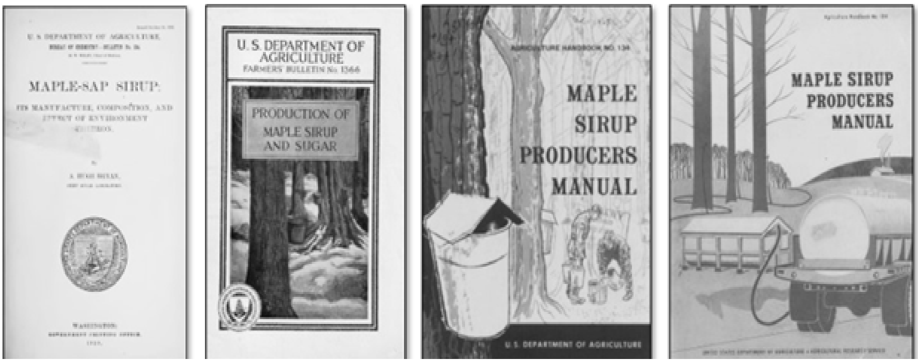
Sirup with an I continued to be presented as the preferred spelling in Webster's Dictionary through the 1950s, but by 1959 with the release of Webster's Third New International Dictionary of the English Language, the primacy had flipped with syrup with a Y getting the main listing and sirup with an I becoming the secondary spelling with a cross-reference back to syrup with a Y. At one point in the 1920s, the GPO style manual began including a list with the preferred spelling of certain words. As early as 1922 we see sirup with an I included in that list. Sirup with an I continued to appear on that list as late as 1973, despite Webster's dictionary shifting to syrup with a Y in the late 1950s. In 2015, with the USDA's Agriculture Marketing Service's issuance of new Standards for the Grades of Maple Syrup, the Department of Agriculture formally decided that it had officially discontinued its spelling of maple sirup with an I and announced that their official spelling would now be syrup with a Y.

Unlike the federal government, most states never formally adopted the use of sirup with an I, with a couple of exceptions, namely New York and Wisconsin. The New York College of Agriculture at Cornell University used the sirup with an I from around 1910 through the late 1950s or early 1960s. Perhaps Cornell University had adopted similar editorial standards for their publications, defaulting to the conventions in Webster's dictionary. Sirup with an I was also used by the State of Wisconsin Department of Agriculture for a shorter period in the 1950s. And that explains the reason behind the spelling of sirup with an I. From the early 1860s to the late 1950s with a holdover until 2015, it was the official policy of the United States Department of Agriculture and the Government Printing Office to spell sirup with an I, based on the guidance and direction of Webster's International Dictionary of the English Language. What remains to be explained is how, why, or by whom the decision was made in publishing Webster's dictionary that sirup with an I should be the preferred spelling over syrup with a Y.

Dr. Matthew M. Thomas is a maple industry historian. You can read more maple history articles like this at his website, www.maplesyruphistory.com

Figure 1

Examples of four covers of USDA maple syrup related publications using the spelling of sirup with an I. Left to right, publication dates of 1910, 1924, 1958, and 1976.



So, You Want to Host a Maple Quality Control Program?
An overview of the requirements to host a Maple Syrup Quality Control Training

The University of Vermont Extension in partnership with the University of Maine Cooperative Extension

have developed a 1-day, hybrid model maple quality control training program. The aim of the program is to educate maple producers from throughout the maple producing region on maple quality control topics. Specific learning objectives include;

- Participants will understand the parameters of the 4 aspects of maple grading (color, clarity, density and flavor).
- Participants will gain hands-on experience with a variety of maple grading tools and will better understand the use of these tools and the effects of improper use.
- Participants will experience guided tasting of high-quality syrup samples that are representative of the 4 Grade A syrup grades.
- Participants will taste and discuss curated off-flavored syrups and will learn the causes of those off-flavors.

This program is offered using a hybrid format. Maple quality educational specialists will lead the educational lectures and discussions over Zoom, while participants from your region are together at a location of your choosing.

WHAT IS EXPECTED OF ORGANIZERS?

On-site organizers will work closely with the maple quality control training educators, Mark Isselhardt (UVM Extension) and Jason Lilley (UMaine Extension), and will utilize detailed instructions to successfully prepare for and host this program. Those instructions will include details on the following aspects.

- Locating and arranging a host site, capable of holding 20 participants, plus organizers and volunteers.
- Promotion to and recruitment of maple producer, packinghouse staff, state inspectors and other interested parties. Programs are prepared for 20 participants.
- Arrange food and technology for the day of. We will supply a video camera, speaker, and microphone system.
- Receive program supplies prior to the program. On the day of the program, the organizer and one other volunteer will need to follow detailed instructions on preparing for exercises. The educators have developed an easy to follow guide for the day.
- Process payment to UMaine Cooperative Extension as a lump sum for the 20 participants at your location.

WHAT PARTICIPANTS WILL RECEIVE

Participants will receive one full day of educational experiences related to all aspects of grading maple syrup. Lectures on all topics are paired with hands-on experiential learning, including utilization of specialized and commonly available tools, and tasting a variety of curated maple syrup. Additionally, participants will receive a tote bag filled with the following items:

- A tested maple syrup hydrometer
- A thermometer
- A current temporary maple color grading kit
- Chemical Safety in the Sugarhouse booklet
- Temperature compensation cards for testing maple syrup density
- Curated maple syrup samples
- And more.

PRODUCER EXPERIENCE

Past program participants have noted a high level of learning outcomes in course evaluations. One producer noted, “Glad to take the course. I was happy to confirm I am doing many things correctly. A few changes can improve the process. The course was very well organized and presented”. Another stated that they “thought the in-person/zoom worked well as it enabled input and info from the instructors who may not have been able to provide the course at our location otherwise.”

HOW TO SIGN UP

We are currently scheduling events throughout the region. If your maple association, Extension office, or local group of maple enthusiasts would like to set up a training, or have please don’t hesitate to contact Jason Lilley at Jason.lilley@maine.edu, or (207) 781-6099

This program is sponsored and supported by the International Maple Syrup Institute and the North American Maple Syrup Council.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The North American Maple Syrup Council's 65th Annual Conference: Portland, Maine October 21-24,2024

Jason Lilley

The 65th Annual North American Maple Syrup Council's Annual Meeting was held in Portland Maine on October 21-24. The event was hosted by the Maine Maple Producers Association with support from the University of Maine Cooperative Extension. This 3.5 day packed schedule was well received and well attended. Approximately 185 registrants signed up from throughout the maple producing region from New Brunswick to Ontario, Minnesota to West Virginia.

The program is an opportunity for delegates of the North American Maple Syrup Council to share what the council and their subcommittees have accomplished over the past year. NAMSC reports included updates on education committee projects and proposals, and updates to the council's approach to funding research projects. The majority of the NAMSC meetings are open to the conference attendees and are a great way to better understand the wide diversity of ways that NAMSC is working to support producers and producer associations.

The trades show floor was well represented by 21 businesses and organizations who support the maple industry. Vendors included a number of equipment manufacturers and distributors, container companies, University Extension services, the USDA National Ag Statistics Service, funding agencies, and more. MMPA included punch cards with folks' registration packets to encourage participants to visit all of the vendors.

On Tuesday and Thursday of the conference week 41 presenters offered 32 technical sessions on 12 different topics. Topics included:
Associations and Collaborative Approaches
The Chemistry of Maple Syrup
Marketing Your Business
Industry Level Marketing Trends
Climate Change
Syrup Quality
Sap Collection
Setting Up a Maple Business
Food Safety
Equipment Discussions
Sugarbush Management
And, Business Management

Reach out to Jason Lilley (jason.lilley@maine.edu - 207-581-8368) for more details on topics and speaker contact info. 96% of participants who responded to a tech session evaluation noted that they 'agree' or 'strongly agree' that the subjects presented were relevant to their operations, and that they'd use material learned in each session to improve their businesses.

The tours on Wednesday highlighted the diversity of local agriculture, the strong microbrewery culture, and the interconnectedness among the local food system in Maine. The Pineland Farm tour stop highlighted this unique farming operation with a dairy, creamery, large produce production, meat processing, and a small-scale sugarhouse. Pineland Farms is open to the public and regularly offers guided tours of the impressive facility. Lone Pine Brewery offered conference goers an inside look (and taste) of one of the Portland area's many breweries. Lone Pine collaborates with the Maine Maple Producers Association annually to make the "Maple Sunday Maple Brown Ale", which is released just before the famous Maple Maple Sunday weekend.

Dunn Family Maple and Merrifield Farm both served as tour stops to highlight the maple production and customer facing aspects of sugarhouses in the greater Portland area. These sugar houses can host well over 5,000 visitors on a typical Maine Maple Sunday weekend. Additionally, Merrifield Farm opened the doors for their very impressive museum of historical maple and logging artifacts. This restored barn is organized and systematic, yet jam packed with interesting tools and equipment that tell the story of the rich history of maple. This museum was a passion project by the late great Lyle Merrifield and will live on in his memory.

Lastly the tour ended at the Cumberland Fairgrounds, where the Southern Maine Maple Sugarmakers Association has their demonstration sugarhouse. Participants had time to tour the sugarhouse, the historic cedar shingle mill, the museum, and other exhibits, all while the lobster and clambake was being prepared.

Everyone was surely stuffed by the end of the feast of lobster and steamers, or steak, with corn, potato salad, drinks, and all of it topped off with a big serving of locally made maple ice cream with a pump of maple syrup on top. One conference goer shared that the conference was "So well done. I felt like royalty. I really enjoyed my time at the fairgrounds and the lobster boil. It's going to be hard to beat this one."

The Thursday evening banquet really sums up why this program has been a mainstay of the maple industry for the past 65 years. The banquet is an opportunity to shine a light on those who have gone above and beyond to support the industry. The evening was launched by the Commissioner of the Maine Department of Agriculture, Conservation, and Forestry, Amanda Beal. She highlighted the state of the industry in Maine, and the importance of this industry to the economic and cultural vitality of the state. That was followed by NAMSC Special Recognition Awards presnted to Llye Merrifield's Family and Theresa Baroun. Hall of Fame inductees Tim Wilmot and Dave Hamilton. Lifetime NAMSC Members Kathy Hopkins and Abby Vandenberg.

The results of the syrup contest are announced at the banquete Finally the winners of the silent auction were announced.

This program would not be possible without the generous sponsorship.

Sponsors for the program include
GOLDEN DELICATE
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Farm Credit East, ACA

The organization of this conference is a major undertaking. While the full team of Maine Maple Producers Association directors and many members contributed to the coordination of this program, this event would not have happened without the dedication and leadership of the Merrifield Family. This program was dedicated to the life of Lyle Merrifield. His passing, just over a month before the conference, shook the entire Maine agricultural community. Lyle's leadership of MMPA, the Cumberland Fair, and numerous other activities that were central to this program will be sorely missed. The continued leadership of JoAnn, Lexi, and Molly to make this event a success is appreciated beyond words.

We hope that all attendees thoroughly enjoyed their time in Maine and gained something that will make your businesses stronger for the upcoming season. Thanks to all who were part of making this event such a success!!

Jason Lilley
Assistant Extension Professor
Sustainable Agriculture and Maple Industry Educator
University of Maine
Cooperative Extension

CONTEST WINNERS

In total the contest had 59 syrup entries and 39 product entries. Flavor (16) and color (21) led to the highest rate of disqualification among all syrup submissions. 59% of the submitted syrup was disqualified based on not meeting one or multiple characteristics.

Here are the winners of each submission category at the 65th Annual North American Maple Syrup Council's Annual Meeting .

Granulated Sugar
1) Alicia & Theresa Baroun of Maple Buzz: De Pere, WI
2) Tony Zenner of Timber Range: Durango, IA
3) Jack Brown of Jack & Jill's Maple Hill Farm, Paw Paw, MI

Maple Candy
1) Kristi & Kevin Brannen of Spring Break Maple and Honey: Smyrna, ME
2) David Briggs of Briggs Maple: Hillsborough, NB
3) David Yeany of Yeany's Maple LLC: Marienville, PA

Maple Cream
1) Rob & Missy Leab of Ioka Valley Farm: Hancock, MA
2) Paul Zononi of Paul's Sugarhouse: Williamsburg, MA
3) David Briggs of Briggs Maple: Hillsborough, NB

Golden Delicate
1) Jo-Ann Merrifield of Merrifield Farm, Gorham, ME
2) Howard Boyden of Boyden Brothers Maple:

Conway, MA
3) Michael Bryant of Hilltop Boilers: Newfield, ME

Amber Rich
1) Dan Brown of Bonhomie Acres: Fredericks Town, OH
2) Michael Bryant of Hilltop Boilers: Newfield, ME
3) Rob & Missy Leab of Ioka Valley Farm: Hancock, MA

Dark Robust
1) Michael Bryant of Hilltop Boilers Newfield Maine
2) Jack Brown of Jack & Jills Maple Hill Farm, Paw Paw, MI
3) Ron Rynard of Green Valley Maple Camp Shephard, MI

Very strong
No places

Contest Winners:(Top)Rob and Missy Leab with Mark Isselhardt
(Bottom)Tony and Deb Zenner with Mark Isselhardt

Contest winners (Top) Jean and Howard Boyden with Mark Isselhardt
(Bottom) Theresa Baroun with Mark Isselhardt

(Top) Allan Greene and Brian Bainbourgh presenting of delegate pin
Photo Contest Winner: (Bottom) : Molly Merrifield with Ben Jorgenson

NAMSC Special Recognition Awards

Howard Boyden

The NAMSC Special Recognition Award is given out by the Board of Directors for the North American Maple Syrup Council. It's purpose is to recognise a person, or Organization, who have made an exemplary effort to advance the causes of the North American maple syrup Council and contribute to the industry in general. This award is presented at the annual meeting in October of each year.

This year's recipients were especially deserving.

The first; Lyle Merryfield delegate for NAMSC for many many years from the great state of Maine. Lyle's contributions to NAMSC and the Maine maple producers association will be long remembered. Due to his untimely death in the late summer of 2024, the award had to be accepted by his family.

Those of us who knew Lyle could immediately see that he was a family man with a very strong passion for the maple business. It showed in everything that he did. From his family's Maple museum to his spotless sugar house, his family always close by enjoying meals together, with their cell phones turned off.

From the moment you met Lyle, you wanted to become his friend. He was that kind of person with a positive attitude and an infectious smileLyle leaves behind huge shoes to fill in the the Maine Maple organization and the North American Maple Syrup Council! It was my distinct honour to recommend him for this award.

The second;
Theresa Baroun, who stepped up, in a time of need when the former executive director of the North American Maple Syrup Council had to step down, due to an employment change that would no longer allow him to execute his duties with NAMSC.

Theresa took the reins at a critical time just before the 2023 annual meeting as our interim executive director. She quickly learned and executed the duties of the job including editing and publishing the Maple Digest. It was almost seamless from the outside looking in. But those of us on the inside knew what a huge task it was and what large shoes she too, was filling. For that reason, once again I am proud to say that I nominated her for the special recognition award.

Thank you to all of the delegates for the North American maple syrup council, for unanimously accepting these two nominations. They were truly deserving of the recognition.

Respectfully,
Howard Boyden, delegate from Massachusetts

(Top) Alexis, Molly and Joann Merrifield and Brian Bainbourgh, NAMSC President presenting NAMSC Special Reconition award (Bottom)Lyle Merrifield

Massachusetts Maple Producers Association

Howard Boyden

Greetings maple producers everywhere!

As the delegate to NAMSC from Massachusetts, I an writing this small article to explain the structure and workings of our producer's association. I am hopeful that other delegates will share similar articles in the future, so that we may all better understand how the business of Maple is done across the region.

The MMPA was established in 1946. Then named, the Berkshire Pioneer Maple Producers Association. We operate with Nine volunteer Board members elected by the membership for three-year terms and a paid coordinator for the day-to-day business. The board members are limited to two consecutive terms, after which, they can run again after taking a year off. From the board members we appoint delegates to NAMSC and IMSI.

As with many such organizations we do have the continuity of repeat board members with others sprinkled in. This keeps the thinking fresh and seems to be a good model for us.

As a service to our members, we have a warehouse (operated by a centrally located family farm, who work on commission of sales). They stock the "Mass Maple" jugs made by Sugar Hill, Shipping boxes,maple cream tubs, labels, promotional materials and various glass containers.

Our income sources are,

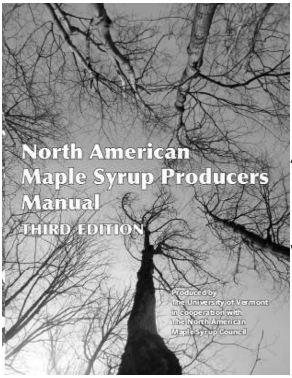
Membership dues, a small commission on jugs, and our main fundraiser, the 17 day long Big E, or Eastern States Exposition. The Big E is also our biggest challenge we man a booth while making, packaging and selling Candy, cream, syrup, cotton candy and maple slushies. This year we added Maple cream glazed donuts. The maple syrup is purchased from mass producers who are willing to sell it to us for slightly above the going wholesale rate. (prepackaged off site) The staffing includes, a paid manager, and assistant manager, and as many volunteers as we can muster. This is an ongoing challenge for the whole 17 days! Our net profit this year was $19,000.00 +-. It gives us the extra funds for printed promotional materials, radio advertising, speakers at our annual meeting and website maintenance. Although we do not do Sugarhouse inspections, we do suggest that individual Sugarhouses join the MA "Commonwealth Quality" program. Designed to recommend standards and goals for producing a consistent high-quality product. We also keep our membership updated as to the latest research and rules pertaining to maple.

We sponsor a Maple weekend, official tree tapping to kick off the season and raise consumer awareness, a summer picnic, usually hosted by a producer and an annual meeting and trade show, where hydrometer testing is done free for any member.

That's Mass Maple in a nutshell!

Check out our website at www.mass-maple.org

Respectfully,
Howard Boyden, Delegate and past President NAMSC



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New Faces of in the Maple Industry

New Brunswick Maple Syrup Association hires a new Executive Director.

On behalf of the Board of Directors, I am pleased to announce the hiring of Mr. David Couturier as the new Executive Director of the New Brunswick Maple Syrup Association. With his extensive experience in management and his deep commitment to the development of the maple syrup industry, Mr. Couturier stands out for his ability to lead with vision and effectiveness. His leadership skills and passion for completing what he undertakes make him the ideal choice to guide our organization towards sustainable and continuous growth in New Brunswick.
His official start date is set for October 7th. We warmly welcome him to our team and are confident that his expertise will greatly contribute to achieving our objectives.

Frédérick Dion
President
New Brunswick Maple Syrup Association

IMSI Hires New Executive Director'

Hello! I!m Kaylie Stuckey, and I!m thrilled to join the International Maple Syrup Institute as Executive Director. My roots in agriculture run deep—I grew up on a dairy farm, where I learned firsthand the values of hard work, resilience, and community. Today, I own and manage a maple bush in South Western Quebec, where my partner and I have built our maple operation from the ground up.
'

Professionally, as a Project Development Officer for a regional school board, I managed large initiatives and worked with partners ranging from community volunteers to government agencies. This experience is something I!m eager to bring to IMSI, where I!ll continue to support industry growth and advocate for sustainable practices. I also hold a commerce degree from Concordia University which has given me a strong foundation in strategic planning and management.

On a personal note, I spent a few years competing on Canada!s National Rugby Team, which taught me the importance of dedication, teamwork, and leadership—qualities I!ll carry with me into this new role. Bilingual in both English and French, I look forward to connecting with maple producers and stakeholders across North America. I!m privileged to be part of this industry, and I can!t wait to meet you as we work together to support and strengthen the world of maple syrup. Please feel free to reach out, whether you need help with a project or just want to introduce yourself—I!d love to hear from you!

Warm regards,
Kaylie Stuckey
Executive Director, IMSI
executivedirector@internationalmaplesyrupinstitute.com

NAMSC Hires Executive Director

The NAMSC has hired Theresa Baroun as the NAMSC Executive Director. Theresa has been involved in the Maple Industry for many years. She recently has served as Interim Executive Director of the NAMSC and is current Executive Director of the Wisconsin Maple Producers Association.

Theresa graduated from the Univerity of Wisconsin Green Bay with a Bachelor's degree in Human Development and Psycology. She has worked in the cabinetry industry, with special needs, individuals, and substitute teaching. Theresa and her family currently own a 1200 tap maple operation, a maple syrup and honey business, and recently opened a cafe in De Pere, WI. Where they use there maple and honey products in food and coffee menu items

In her position as executive director she is eager to work with NAMSC members and delegates helping with the lines communication. Also work with association in common issues in the maple industry.Work on added more research to maple research.org. And work with IMSI together to help support and strenghten the maple industry.

In her position she will be working with researchers to add more research to mapleresearch.org. and will continue to work at ways to improve the NAMSC website and Maple Digest. She will also continue to work with Alliance partners and researchers. Theresa can be reached at maplédigest@gmail.

Letter from the Editor

Theresa Baroun

Hello Maple Enthusiast,

As editor of the Maple Digest. I want to introduce myself and a small column you will see in the Maple Digest you will see in each issue. I was hired as Interim Executive director of NAMSC and editor of the Maple Digest in July 2023. And recently been hired as NAMSC Executive Director which includes editor of the Maple Digest. With my family we own and operate a maple and honey and newly opened cafe in De Pere, WI.

The Maple Digest is a very resonable publication that is made possible by researchers, advertisers, associations, maple producers and NAMSC members.

NAMSC has created a committee to work in enhancing the Maple Digest. A person will see a few changes to start which will include information about associations , producers and events, A person will continue to have articles about the great research our researchers continue to do for the benifit and knowledge of the maple industry.

Feel free to reach out with an articles, pictures, advertisements, events that you would like added to the Maple Digest. Please also feel free to reach out with any suggestions you feel could help enhance the Maple Digest.

Have a Happy Holiday season,

Theresa Baroun, Maple Digest Editor

The **Vermont Maple Conference Week** returns from **December 9-14, 2024** with a blend of in-person and online sessions for maple producers, enthusiasts, and industry professionals. Hosted by the Vermont Maple Sugar Makers' Association (VMSMA) and UVM Extension, the event includes expert-led workshops, discussions on industry advancements, and valuable networking opportunities. Whether you're an experienced sugar maker or new to maple, this conference offers valuable insights and practical tools to help grow your business.

WMSPA Winter Institute, and Maple Vendor Trade Show January 3-4, 2025

The Wisconsin Maple Syrup Producers Association is holding their Winter Institute and Maple Trade Show "Building Quality in the Maple Industry" on January 3-4, 2025 at Hotel Marshfield in Marshfield, WI. The two day institute will include, on January 3,2025, the One Day Grading school presented by Jason Lilley, University of Maine Cooperative Extension and Mark Isselhardt, University of Vermont Proctor Research Center, Vendor Trade Show, hydrometer testing, seminare on small scale candy and maple sugar.

New for 2025 a Student Day will be held at the Winter Institute. This is free to students. Student Day will include Beginnner 101, Lunch, where I am today and careers in the maple industry. Pre Registration is Required.

On January 4, 2025 the day will begin with the maple vendor trade show and hydrometer testing, along with seminars on Avoiding Common Syrup Quality Issues, WI Regulations and Licensings of your Sugarbush, Agri Business Tax Planning, Beginner 101, Sugar Bush Maintence, 3/16 Tubing Basics and Maintaining Tubing Yields, and Crafiting with Circut's. All seminars are subject to change. A silent auction will be held with proceeds going to NAMSC Reaserch fund and WMSPA. A person can register for the event at www.wismaple.org

Saturday, January 25, 2025

Grappone Conference Center, Concord, NH

Come enjoy the meeting, have lunch and even win a door prize. Stay up to date, scan the QR code!

Sponsorship opportunities still available, email us to learn more!

New Hampshire Maple Producers Association, Inc.

nhmapleproducers.com
info@nhmapleproducers.com
(603) 833-2347

Support the Maple Research that Supports you!

Every time you set a tap, fire your evaporator, or put syrup into bottles, you are benefitting from research that helped us all learn how to do these things better. Much of that research has been supported by the North American Maple Syrup Council's Research and Education Fund. The Fund has given out more than $1 million in grants in the last 35 years, catalyzing the research that has helped the maple industry grow and thrive.

The fund gets its resources from industry stakeholders – equipment manufacturers, producer associations, dealers, and individual producers. Alliance Partners commit to making annual contributions that help assure the long-term sustainability of the Fund.

If you're interested in becoming an Alliance Partner, or in making a one-time donation to the fund, contact NAMSC Executive Director Theresa Baroun at mapledigest@gmail.com, or Treasurer Joe Polak at joe.maplehollow@frontier.com.

Thank you to our current Alliance Partners!

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Randall's Heritage Maple
Vermont Maple Sugar Makers Association
Wisconsin Maple Syrup Producers Association

Please Consider Including NAMSC in Your Estate Plan

The North American Maple Syrup Council has received a number of generous bequests from sugarmakers who wanted to ensure that the important work of our organization can carry on.

Contact your attorney for information on how to revise your will, or your financial institution, plan administrator, or life insurance agent for the procedures required to revise your beneficiary designations.

Classified ads

Classified ads are free for Maple Syrup Digest subscribers (as space allows). Send ads to mapledigest@gmail.com.:

WANTED: Maple Syrup Memorabilia. Old maple tin cans, bottles, taps, packing labels, brochures, signs, candy molds and other related maple syrup items. Also back issues of the Digest, Contact Don Bell: 203-268-7380, thedbells@msn.com.

MARK YOUR CALENDERS
2025 NAMSC Maple Syrup Conference in Port Huron, Michigan at the Blue Water Conference Center
Oct. 22-25, 2025
For more information go to:
www.michiganmaple.org

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