Maple Syrup Digest

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2025 International Maple Hall of Fame Induction
When to Add a Second Tap Under Vacuum
2025 Maple Crop Reports

The Newsletter of the North American Maple Syrup Council

MAPLE SYRUP DIGEST

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NAMSC Executive Director / Maple Digest Editor: Theresa Baroun
www.maplesyrupdigest.org
mapledigest@gmail.com
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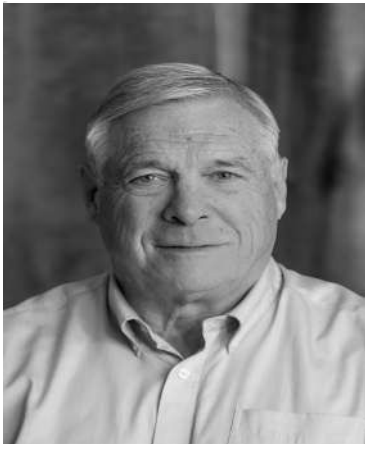
NAMSC's Mission is to be a leading advocate and resource for maple associations and their members, working to ensure that sugarmakers have the tools and support needed to sustainably produce high quality products.

NAMSC's Vision is for all sugarmakers to consistently and sustainably produce high quality maple products.



President's message

Our Maple industry this season continued to see a yield keeping pace with increasing consumer demand for our product. I experienced, as many others did, a more traditional maple season this spring. I think how lucky we all are to work in an industry in which Mother Nature provides the first agricultural product of the year.

While the size of our operations — from large commercial enterprises to local artisan makers — may differ, we all face the same challenges. Issues arising from weather events and climate change, increased consumer demand, a steady labor supply and political uncertainties confront all producers, whatever the nature of our operations. Yet all the while, we strive to maintain a food product that is pure and distinct from other sugar substitutes.

As an Industry we are fortunate that overall demand continues to grow, as more and more consumers discover the benefits of including maple in their diets. Producers understand that if you make a quality product, it will sell.

All of us in the industry fully appreciate the unique aspects of our product, and the unique character of our maple forests, transcending borders. We all must keep in mind the need to collaborate as a single Industry, an industry that has always cooperated for the betterment of the sector as a whole.

Our organization continues to celebrate the work of our North American maple farmers. NAMSC held its semi-annual in-person meeting in Croghan where we received updates from Kathy Hopkins, the research chair, and from Carleton University's Dr. Maria Derosen regarding the buddy sap research initiative. Jason Lilley updated details about the successful outreach of the International Maple Grading school.

Our sincere thanks are extended to the International Maple Museum and the Hall of Fame committee for all their efforts making the weekend a success. Being able to greet so many past inductees in attendance at the meeting is a tribute to the ongoing commitment of so many people. On the day following the meetings, the Hall of Fame recognized years of dedication, in both David Hamilton(Indiana) and Tim Wilmont (Vermont). If you haven't had the opportunity to attend the Hall of Fame in Croghan, NY, please make the effort at some point. You will be rewarded in your visit — it's a truly worthwhile experience.

One of our industry's most effective forums for sharing knowledge is the in -person International Maple Conference. This year's event is being held by Michigan in Port Huron October 22-25, 2025. Please consider taking part, as it's a great opportunity to expand your

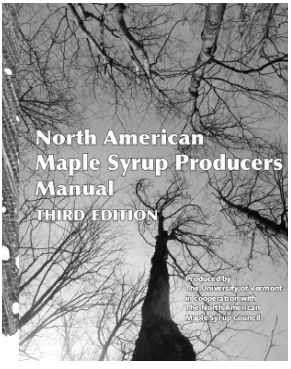
knowledge, and improve your operation. I can guarantee you will take away some new skill or information that will enhance the work in your own operation. Further, your participation only benefits the whole industry; we thrive because we include a wide range of involved delegates around the table. Please reach out to your local delegate or any member of the executive if you have any input or concerns, and think about ways you can become engaged.

To ensure the ongoing growth of demand, we must keep improving the overall quality of the product we produce. With that in mind the International Grading School continues to be held the 2 days before the Conference. This learning opportunity can only benefit the standards of your operation, and ensure the best possible product. If you haven't taken the school please consider registering this year. I guarantee you will benefit from it.

Brian Bainbourgh

Order the 3rd edition of the North American Maple Syrup Producers Manual at:

www.mapleresearch.org/ordermanual



In this issue...

Cover: 2025 Hall of Fame Inductees, Tim Wilmot, Vermont, and David Hamilton, Indiana

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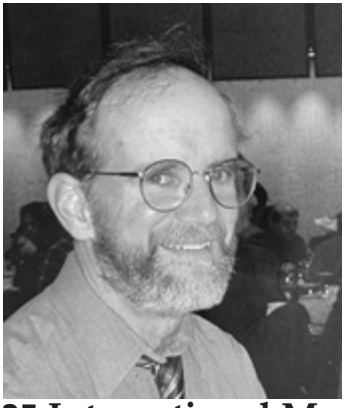
2025 Maple Hall of Fame Inductee David Hamilton

David Hamilton was first exposed to the world of maple syrup when he married Carol Ann Rutherford in 1963. The Rutherford Sugar Camp dates back to 1911 when Carol's grandfather, Lewis Rutherford began tapping trees in east central Indiana. Dave and Carol took over the operation when her father, Bill, passed away in 1977. The name of our camp remains the Rutherford Sugar Camp in his honor. In 1981 a new sugar house was built one fourth mile south of the original camp. This season marks the 60th year of processing pure maple syrup for Dave and Carol with the help of son Doug, his partner, Xiaobin Chen, son Craig, wife Cara and Granddaughter Laura. Laura represents the fifth generation sugar maker. The daily Rutherford Sugar Camp crew consists of Gary & Melvin Hawks, Brad Fellers, with help from my nephew Gary Hamilton. I would not be able to continue to make syrup without their valuable assistance.

Dave is a founder and charter member of the Indiana Maple Syrup Association, and has held several offices in that organization. He was President for ten years and a board member for many years. He has also been active in the state association's involvement in the Pioneer Village of the Indiana State Fairs Hoosier Sugar Shack. For many years he chaired the volunteer work schedule for the sugar shack. He also has helped prepare syrup for the fair and has worked several days at the fair along with Carol.

For several years Dave was the Indiana Delegate to the North American Maple Syrup Council and served on the following committees: the nominating committee, the strategic planning committee, the by-laws & constitution committee, the membership committee, and the education committee. In 2014 & 2015 he served as president of NAMSC. In 2016 he was awarded the Special Recognition award from NAMSC. In 2024 Dave & Carol were presented with a Lifetime Honorary Member Award from the Indiana Maple Syrup Council.

The knowledge I have gained because of my involvement with the North American Maple Syrup Council has resulted in many improvements in my sugar house. I am very appreciative of being inducted, along with many giants of the maple industry, into the International Maple SyrupHall of Fame. It is the highest honor a ugar maker may achieve. I share this honor with a number of people, both from Indiana and all the maple producing states and provinces, who have influenced me in many positive ways to make me a better sugar maker.



2025 International Maple Hall of Fame Inductee Tim Wilmot

Tim Wilmot: A summary of my career as a maple researcher, 1986 to 2018.

In 1986 I finished a master's degree in Botany at the University of Vermont and was invited by the new director Dr. Mel Tyree to join the staff of the UVM Proctor Maple Research Center. At that time, I had no experience with sugaring and not a lot of knowledge of how it was done. After discussions with several scientists and at the recommendation of Sumner Williams, assistant director of the Proctor Center, I decided to investigate sugarbush fertilization, which became my irst major research subject. At that time there was great concern on both sides of the border about maple decline, perhaps due to acid rain, or other conditions, and interest in whether supplementing forest nutrition could counteract this phenomenon. For the next 3-4 years I designed and implemented a study, with the help of two Proctor techni cians, at seven sugarbushes in Northern VT located on stands that ranged from healthy to badly declining. This pro
ject involved sampling soil and foliar nutrition, adding nutrients to parts of the stands, and rating the conditions of many of the individual trees in each stand both before and after fertilization. The results showed some improvement
due to nutrient addition, but also natural improvement likely due to underlying geology or increased rainfall. The results were published in three scientific journals and were presented at several meetings in the US and Canada. In addition, I produced a brochure, with Dr Tim Perkins, on sugarbush nutrition and fertilization, which can be seen at https://mapleresearch.org/wp-content/uploads/fertsugarbush.pdf . The goal of this brochure was to direct the study's findings to sugarmakers rather than to a broader scientific audience. From this point forward and for the remainder of my maple career I tried to aim my research results toward sugarmakers, rather than an academic audience, attempting to show producers the reason for the studies and to make my results clear and understandable. I hope I succeeded. Over the years I presented at meetings all across the maple region, from Wisconsin and Indiana to Nova Scotia and New Brunswick and south to Virginia and West Virginia. In addition, my study results appeared in print through the Maple Syrup Digest, the Maple News, through a column in New England Farmer, and via many other methods.

Soon another pressing issue evolved in the maple world—the question of lead in maple syrup. . There was much concern about where the lead was coming

from—was it from the trees, or from various pieces of sap collecting, pro cessing and/or storage materials? I helped design a study to answer some of these questions, and with the aid of a Proctor technician visited a number of sugarbushes in search of data. We collected sap and syrup that had passed through metal spouts and buckets, plastic tubing, various pumps, boiled in back and front pans of different manufacture, and stored in old and new drums. While I cannot take credit for the major changes that took place over the next few years in the manufacture and use of sap and syrup equipment, it was clear that this research opened the eyes of many producers, particularly those using more "traditional" methods such as collecting sap in galvanized buckets, boiling in lead-soldered pans, and storing syrup in heavy duty galvanized drums, or milk cans. A brochure, "Keeping Lead Out Of Maple Syrup", was written with myself as the primary author, and distributed widely: https://agnr.osu.edu/sites/agnr/files/imce/pdfs/maplesyrup/KeepingLeadOutofMapleSyrup.pdf

In addition, I spoke to many audiences around the maple world about our findings, and also discussed the possibility of lead addition from practices such as delaying the emptying galvanized buckets, or excessive pumping of sap with lead-containing bronze gear pumps. I visited several equipment manufacturers, including Leader Evaporator, Waterloo Small and Dominion and Grimm, where new welded equipment was being made in order to show my audiences the new choices that were becoming available. This was one example of how maple manufacturers in the U.S. and Canada had generously provided factory floor tours and discussions with me about how equipment was made, including the new polyethylene tubing that became available in the 90's, so that I could share in many presentations with my audiences the various manufacturing methods and properties of these materials.

Another topic of presentations provided at a number of NAMSP conferences, was an explanation of the maple sap flow mechanism in terms that were easily understandable; presenting work that had been in progress for decades by scientists at the Proctor Center by noted researchers like Jim Marvin. While in years subsequent to this there has been much research that described the science of sap flow, a lot of which has appeared in scientific journals, I tried to create a visual explanation of what was happening in the trees we tap. Over the years I refined my presentations by adding data that I had collected showing changes in pressure within the trunk during the spring. Con't... I found sensors that could measure pressures in the ranges occurring in maple trees, installed them in tapholes, and connected them to data loggers. Data loggers allow the possibility to collect electric signals in short intervals, which might correspond to what is put out by a pressure sensor or a temperature monitoring thermocouple. Many thermocouples were installed in tree trunks and in small branches, some as high up as 54'. The data loggers had been used extensively by Tim Perkins in his own research and from him I learned how to program them and connect them to various sensors.

Data loggers are powered by batteries, so they could be located anywhere in the woods. I built a shed a few hundred yards from our lab, which housed a computer connected to our internet via a fiber optic cable, and was able to present data in real time on our website. Eventually I created a system to monitor pressure, temperature and sap flow simultaneously, so that it was visible to anyone. Sugarmakers could look at the data, and see whether the tree branches had frozen overnight, how this was affecting the pressures, and how sap flow was responding. In some cases, sugarmakers near the Proctor Center, learned when to hurry home and start checking their tanks. This system we called Treemet, and it ran for many years.

https://www.themaplenews.com/story/58-top-performer/28/ Using this data, I wrote some articles for sugarmakers explaining what was happening, including one called "Temperatures in the Sugarbush" that showed how the freezing temperatures that could initiate sap flow were related to the temperatures in small branches, often high in the crowns, and not necessarily related to the temperatures we measure at home or through the National Weather Service. https://www.uvm.edu/d10-files/documents/2024-10/temperaturesinsugarbush2006.pdf.

At the Proctor Center we collaborated on several studies, such as the difference between what were then "standard" 7/16" spouts and the new small 5/16" spouts, in terms of both sap flow and wounding. A complementary study I conducted took place over several sap seasons, and examined the timing of tapping in regard to sap yield. This study involved comparing yields from groups trees where sap was collected under either gravity or vacuum. Collecting sap under vacuum from individual trees had become possible at the Proctor Center due to the use of new clear plastic 4-gallon tanks designed by Tim Perkins, and used in many subsequent studies. At the time I started this project, the common wisdom among many producers was that tapholes drilled too early would "dry up" well before the ideal sap flow weather ceased so I divided the groups of trees into 3 tapping dates: early January, mid-February, and early-mid March; the latter had usually beenthe traditional tapping date for many Vermont producers. Over the course of this study, I was able to show that holes drilled much earlier than the traditional date usually remained active right through the end of the season, and when the January tapped holes started to slow in March or April, the total sap collected usually still exceeded the sap volume from the later tapped holes due to the collection of sap during mid-winter thaws. These results were shared at many maple meetings.

Another study in which I used vacuum sap collection chambers was a comparison of sap yield from trees that had one tap or two, using groups of trees averaging either 16" in diameter, or 19.5" in diameter. In addition to collecting sap, I used pressure sensors connected to data loggers, as described above, to show where in the trunk the sap was coming from. Thus, I was able to show the area of the trunk affected by the taphole, and how the second taphole, over time, "shared" the same part of the trunk in terms of sap flow.

https://mapleresearch.org/wp-content/uploads/0613yieldsoneortwotapholes.pdf

Data from this study became one small part of a much larger project involving a number of researchers at the Proc tor Center who were developing new tapping guidelines for the maple world.

Around 2002, with the retirement of then Extension Specialist Larry Myott, I became the new University of Ver mont Extension Maple Specialist, remained housed at the Proctor Center where I was able to continue to share ideas and results with my fellow Proctor researchers. One of my new duties, and one that I'm proud of, was working with fellow Extension specialist George Cook to develop the new Vermont Maple Conferences. Previously, Vermont held January maple meetings in each county. These consisted primarily of a social gathering and meal, a presentation from the head of the Vermont Association Bill Clark, from a Vermont Department of Agriculture representative, and from a Proctor representative, with little other content. We decided to substitute January conferences at key locations around the state (eventually 2 or 3 locations) that emphasized education, where each hour sugarmakers would have choices of a range of presentations from fellow sugarmakers, researchers, and state professionals covering many topics. A system like this had already been established with one major maple "school" in New York state. While something perhaps was lost by the social gathering of sugarmakers from a common county, I believe much was gained in providing producers with the ability to learn more from researchers and successful colleagues who could share their knowledge and experience and initiate discussions with in each class. A form of these Vermont conferences continues today, with much of the content also available online in addition to in-person.

Another Extension duty that I enjoyed was helping to advise county groups, who rotated yearly, in putting on the Vermont summer tour, "Maplerama." I made new friends among each group, learned new things about the counties and their producers, and shared the satisfaction of participating in the presentation of a large and complex event with my adopted county.

There were some additional projects that I initiated as an Extension specialist. Using my botany background I developed presentations about invasive plants in the sugarbush. Several of the sites that I visited, particularly in Southern and Central Vermont, were becoming overrun with non-native plants such as Japanese barberry, honeysuckle, and European buckthorn, all of which crowd out maple seedlings and can provide a home for ticks- a growing problem in sugarbushes. I worked with Vermont county foresters and professional forest management consultants to develop information, workshops and presentations about this issue. Questions about invasive plants and ticks were added to a yearly survey that I managed at the end of each sugaring season, along with questions about sap yields in relation to tubing design, grades of syrup made, tapping depth, etc. An example of the results from a yearly "tapping survey"

can be found here: https://mapleresearch.org/wp-content/uploads/tappingsurvey2012.pdf

One more large goal around which I developed several years of research was how to improve gravity sap collec tion. I was familiar with many producers who were using 5/16" gravity tubing (i.e. without attachment to a vacuum pump) who usually had poor sap yields compared to producers using pumps. Many of these producers had too few trees to justify the expense of a pump, or their stands of trees were too separated from each other and too far from electricity to power a pump. How could I improve their sap yields? For several years I had been interested in how sap could flow through a very small diameter tubing (as small as 1/16" diameter, pressed into a hole in the trunk of that diameter) and form a continuous column of sap. After thinking about the physics of this phenomenon, I decided to experiment with different diameters of tubing attached to actual maple tapholes. All of the "equipment" that I began using came from scientific supply catalogs, including the tubing (very stiff at the beginning) and tiny fittings mean for various plumbing applications in research. After another year or two of additional trials, I found that 3/16" tubing was the best size to use, as it was much smaller than standard maple tubing and thus could provide a solid column of sap (and provide vacuum) under most sap flow events, yet large enough that the fittings would be reasonably robust and hold up under tension when stretched between trees. I collected sap from trees on a steep slope along a ravine at the Proctor Center. The results were quite promising—I achieved very high vacuum in the lines and the sap yield was quite good. The following year Gary Gaudette of Leader Evaporator agreed to make several rolls of 3/16" tubing using the Leader Extruder. Results continued to be excellent. Soon, I talked Dominion and Grimm into making and selling 3/16" tubing (I have never had an economic stake in this research) and soafter this several companies began making 3/16" tubing using various formulas (mostly of different rigidity) as well as fittings. I continued to experiment with various ways to set up the tubing, wrote articles about this research, and made many presentations around the maple world. One of my first was https://mapleresearch.org/wp-content/ uploads/0612highvacuumgravitytubing.pdf

After retiring from the University of Vermont I was hired by Benoit Pepin of Dominion and Grimm to continue research on 3/16". Within a few years there seemed to be considerable interest in using 3/16" tubing in conjunction with high vacuum pumps, but eventually these pumps became so efficient that there was probably little reason to supplement vacuum with gravity. Other issues, including plugging of the smaller fittings with bacteria or other scum over a period of years were reported and studied by some researchers. I remain convinced that for the same producers who I originally targeted, those with smaller operations on good slopes, 3/16" tubing can be a valuable tool to aid production, and am heartened by occasionally reading letters or articles in maple publications by sugarmakers who are likewise convinced that 3/16" tubing is what they prefer.
-Tim Wilmot

Past International Maple Hall of Fame Inductees

Tim Wilmot and his wife, David and Carol Hamilton

When to Add a Second Tap Under Vacuum? - Part 1

Timothy D. Perkins 1 , Abby K. van den Berg, Mark L. Isselhardt 2 , Brendan Haynes, Wade Bosley 1 , and S. Abair 11 Proctor Maple Research Center, University of Vermont, Underhill, Vermont, U.S.A. and 2 Extension Maple Program, University of Vermont, Underhill, Vermont, U.S.A.

Determining the proper diameter at which to put a second tap in a maple tree can be difficult. The decision can be affected by numerous factors, including: tree diameter, tree growth rate, previoustapping history, whether vacuum is used and if so, what level, the additional yield of sap, and the cost/benefit ratio (factoring in both time and $), among others. These considerations have factored intothe development and use of tapping guidelines. In some cases, guidelines were developed with science-based answers to some of these questions. In other cases, guidelines were more of a "rule-of-thumb"used by producers in broad regions. While tapping guidelines are mostly, as the name implies, non-regulatory suggestions, in other cases such as in organic production or when producers lease taps, neglecting to adhere to guidelines can have undesirable consequences such as revoked organic certification or losing the ability to access leased taps.

A review of the history of tapping guidelines relating to 7/16" spouts was published in the Maple Syrup Digest in 2004 (Chabot 2004). Since that time, most maple production has switched to the "small" spout ranging from 1/4" to 5/16" in diameter. Chabot followed up his initial tapping guidelines paper with another paper (Chabot 2005) which discussed many of the factors involved and was aimed at introducing new tapping guidelines. He suggested that a second tap was generally not indicated unless trees had very high growth rates or were very large.

For those able to read French, Grenier et al. (2008) provides a detailed analysis of the factors involved in determining the number of taps per tree. One of the primary results was that many trees in Quebec did not possess a growth rate high enough to sustain long-term tapping with even a single large spout. This work likely hastened the adoption of smaller (19/64" and 5/16") spouts by the maple industry in the U.S. and Canada.

Due to the considerably smaller wound produced, the minimum diameter for tapping was lowered after the introduction of the "small" spout in the mid-late 1990s. However, given the lack of research available at the time, the North American Maple Syrup Producers Manual 2nd Edition (2006) recommended the same tree diameter guidelines as those developed for 7/16" spouts. Despite this, many producers began tapping smaller trees shortly af.

ter the small spout was released, and tapping guidelines were revised to lower diameters over the following decade

On the topic of using multiple tapholes in the same stem, Wilmot (2013), in a study during the 2010 and 2011 seasons, found that with approximately 24" Hg of vacuum, a second taphole produced an average of 52% and 66% additional sap in 16" and 19" diameter trees, respectively. In the same timeframe, van den Berg et al. (2013) suggested adding a second taphole only in healthy trees with excellent growth rates to avoid excessive and unsustainable rates of non-conductive wood formation. These and other studies led to the conclusion by Rademacher et al. (2023) that a second taphole on vacuum provides only a marginal increase in sap yield. At present, many producers using high-sap yield practices place only one taphole per tree regardless of diameter, or add a second taphole only sparingly.

As part of the focus at the UVM Proctor Maple Research Center to provide science-based research on the effects of various tapping practices on sap yields, we are interested in the amount of additional sap produced by a second taphole from both red and sugar maple stems. .

Our first approach to answer this question utilized data that were collected as part of a previous study examining syrup production (calculated from sap yield and sap sugar content) from individual trees across a wide range of sizes on a vacuum tubing system. These results (Figure 1) were first published by Isselhardt et al. 2018 and show a steady, linear increase in syrup yield as tree diameter increases, as indicated by the dashed line. In general, for each 1" diameter increase, an additional 0.67 lbs of syrup was produced.

A closer examination of these data show that, although there is a great deal of variation, the best-fit trend (shown as a solid line) is not actually linear, but rather is a second-order polynomial (curved) line where increasing syrup yield with increasing tree diameter starts to deviate from the linear trend at about the middle of the tree size range in this study (13 inches dbh). The difference between the linear and best-fit trends in syrup produced increases as tree size gets larger. This variance reflects, in part, the potential amount of sap that is left uncollected in the absence of a second taphole. Given the physiology of sap flow this makes sense, as at some point the amount of time in the average sap flow event becomes insufficient for the majority of sap to be able to exit from a single taphole.

Figure 2 depicts the difference between the linear and curved trends more clearly. At a tree diameter of 13 inches no additional syrup is collected. At 15 inches, there is a gain of 0.09 gal of syrup (1.0 lbs) with a second tap. At 20 inches diameter, 0.3 gal (3.3 lbs) more syrup would be collected with a second tap, at 25 inches, the increase would be 0.42 gal (4.6 lbs) more syrup, and at 30 inches diameter the additional syrup would total 0.47 gal (5.2 lbs). Above 30 inches dbh, the projected additional

syrup levels off, indicating that the maximum additional projected syrup gain with a second tap has been reached.

At what diameter the additional amount of syrup gained from a second tap makes sense to implement depends largely upon the overall cost of production for a given operation. Besides the material cost (dropline, tee, spout), there is also the time spent tapping and leak checking the additional tap. Producers frequently indicate that a second tap is easily missed while tapping, leading to leaks and delays reaching a tight vacuum system. Since the economic calculation will vary from operation to operation, the decision of whether or not and at what point to add a second tap is best left to each individual maple producer to make. As a rough example however, if the commonly used diameter of 18 inches to add a second tap is used, after subtracting out material cost the additional syrup gain will add a net profit of approximately $5.75 (discounting labor) for each second tap (at that size) at prevailing 2024 bulk syrup rates.

It should be emphasized that these potential syrup gains with a second tap are estimates only, and that confirmation with field experiments over several seasons is required. Clearly this analysis is a simple projection based upon one data set at a single location, and assumes that all the sap (and sugar) is available and will be collected with the addition of a second tap. In reality, the flow of sap from a taphole within one season is quite variable based upon how the season plays out, the aspect (direction) of the taphole, and (perhaps) the relative position and distance between the two tapholes used. Secondly, this analysis does not factor in the sustainability of adding a second taphole from a standpoint of wounding. Tapping intensity and development of non-conductive wood should always be a consideration, especially if dealing with large, slow-growing trees that have been tapped for a long period of time (van den Berg et al. 2013). Long-held, but incorrect and scientifically disproven recommendations about preferentially tapping on the south side of the tree, under a large branch, or over a large root concentrate nonconductive wood formation within a focused area and lower the changes of finding a clear wood. Those types of practices must be avoided.

Despite these issues, this study provides an estimate of the potential amount of syrup gained with a second taphole in mature maple trees under vacuum collection conditions and provides maple producers with valuable information they can use when making decisions about tapping practices to employ in their operations.

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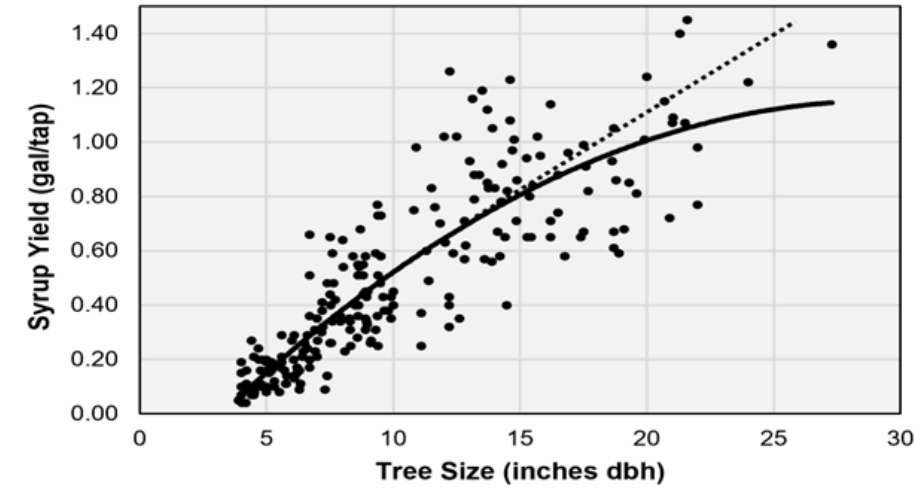

Figure 1. The relationship between tree size and syrup yield (derived from sap volume and sap sugar concentration measurements) on vacuum. All trees had one taphole and collection was done with vacuum. The dashed line is the linear-fit regression. The solid line in which syrup yield drops off as trees get larger is the second-order polynomial, best-fit line ($r^2 > 0.999$). Figure is adapted from Isselhardt et. al. 2018.

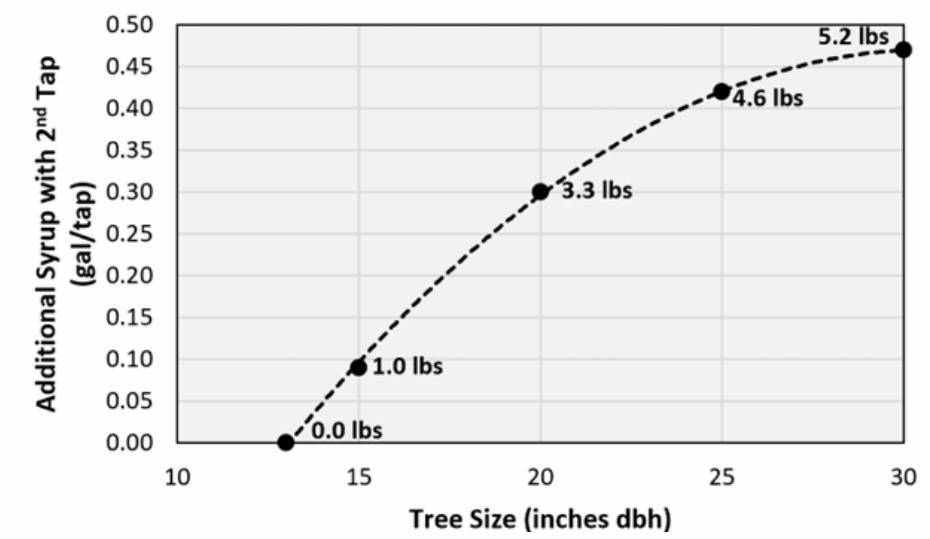

Figure 2. The relationship between tree size and additional syrup yield that could potentially be collected from a second taphole in the same tree on vacuum. Figure is adapted from data presented in Isselhardt et. al. 2018. This represents the difference between the linear fit and polynomial fit lines to estimate the projected additional gain in syrup from a second taphole. Y-axis is in gal/tap and values for selected points within the figure are estimated additional syrup in lbs/tap at that diameter. The flattening of the curve above about 25 inches diameter indicates that additional sap might be able to be collected with a third tap in trees above that size, although this is not recommended based upon the impacts of internal wounding on tapping sustainability.

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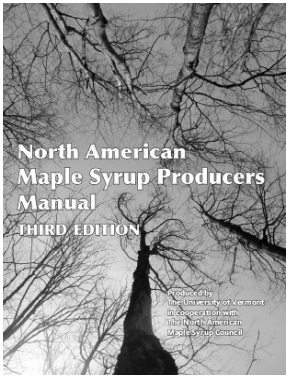

When to Add a Second Tap Under Vacuum? - Part 2

Timothy D. Perkins1, Abby K. van den Berg, Mark L. Isselhardt2, Brendan Haynes, Wade Bosley1, and S. Abair1
1 Proctor Maple Research Center, University of Vermont, Underhill, Vermont, U.S.A. and
2 Extension Maple Program, University of Vermont, Underhill, Vermont, U.S.A.

In a previous article we reviewed previous work and described an approach to determine the amount of syrup gained by adding a second taphole to a tree (Perkins et. al. 2025). This study follows up on that work by determining yields from trees across a wide range of sizes with either a single, or two tapholes, over several seasons.

This work was conducted at the UVM Proctor Maple Research Center in Underhill Center, Vermont, from 2019-2024. In 2019 and 2020, red maple trees were studied. Sixteen trees averaging 15.1 inches dbh (range 13.1-19.4 inches dbh) were used. Half the trees had a single taphole with the other half having two tapholes. When two-taps were used, one taphole was drilled above the lateral and the second taphole drilled below the lateral on the opposite side of the tree. This approach was chosen to maximize the separation of tapholes on the stem as a way to maximize sap yield. Droplines were 36" and tapholes were 5/16 inches diameter drilled 2 inches deep. All tapholes within a season were drilled on the same day by the same person. Vacuum was supplied by a Busch rotary-claw pump running at 27-28.5" Hg.

From 2021 to 2024 (4 seasons), the yield from sugar maple was measured. For the 2021 and 2022 seasons, 20 trees were selected with an average dbh of 15.8 inches (range 12.7-23.4 inches), with 10 trees having a single tap and 10 trees having two taps. Again, tapholes were on opposite sides of the stem and above and below the lateral line. During the 2023 and 2024 seasons, larger trees were used, with an average diameter of 24.7 inches (range 18.7-32.5 inches dbh), again with tapholes placed for maximal separation.

Tapholes were connected to individual vacuum sap collection chambers in which sap could accumulate during each flow period. Sap yield and sap sugar content was measured after each flow and totaled for the season. In some cases, particularly with red maple in 2020, tapholes for undetermined reasons produced little or no sap. In those cases, the data for those trees was discarded.

For red maple in 2019, two tapholes from one tree produced on average 21.8% more sap than one taphole. In 2020, two tapholes produced only 1.8% more sap than a single taphole.

As noted earlier, the 2020 results included several dry (or nearly dry) tapholes, so it is unclear whether the low additional sap yield was due to seasonal variation, was normal, or was due to the high number of dry tapholes.

With sugar maple, the additional amount of sap collected from 2021-2024 averaged 28.8% with a range from 22.7-37.7%. In general, the amount of sap collected across the two tapholes in the two-tap trees within each season was roughly equal. The greatest difference occurred in 2024, when by the end of the collection period 60% of the taps placed below the lateral (on the south side of the tree) had dried out, compared to only 10% of the taps placed above the lateral line, including both the single and double-tapped trees. This also likely reduced sap yield from the two-tap trees, thus causing a somewhat lower additional amount of sap from those trees that year. Additional sap yield from the two-tap trees over the one-tap trees for red maple in 2019 was 21.8%, close to the low end of the difference seen for sugar maple trees.

Sap sugar content did not differ substantially between one and two-tap trees, averaging 1.86 and 1.78°Brix, respectively. In three of the seasons, sap from one-taphole trees was marginally higher – in other years the sap from the two-taphole trees was slightly higher.

Over the six years of study, including both red and sugar maple, the average increase in sap yield with a second tap for trees was 23.1%. If we exclude 2020, the average increase in sap yield for red and sugar maple with two taps is 27.4%, which is close to the 28.8% average increase of sugar maple alone.

In order to examine the effect of tree size on sap yield increase, plots of sap yield by tree diameter were constructed and linear regressions of sap yield by tree size calculated for one-taphole and two-taphole trees for each year. From these relationships, the amount of additional sap that could be produced from two-tapholes above that of a single taphole was calculated for a range of sizes for each year of the study (Figure 1). Due to the low number of trees and the high number of dry tapholes, data from 2020 (red maple) was not used in this analysis.

Trends for sugar maple trees from all years showed general steady increases in the amount of sap produced from two tapholes as compared to one as tree size increases. Results from the 2021/2022 seasons (sugar maple, smaller average tree size) produced a higher amount of additional sap with two tapholes than the 2023/2024 seasons (sugar maple, larger tree size). This may somehow reflect the differences in experimental setup, or simply differences among the individual seasons. The amount of flow during individual seasons is strongly related to the number of high-flow events (Perkins et. al. 2025). Seasons with more high-flow events produce more sap whereas seasons with low-moderate flow flow events have little impact on total seasonal production. This is likely a result of the number, depth, and duration of thaws during each season, which is

highly variable from year-to-year.

Although there is significant variation from year-to-year, by combining the trends for sugar maple trees (2021-2024 seasons) and assuming an average sap sugar content of 2°Brix we see the average relationship between tree size and the additional amount of syrup produced (Figure 2). The estimates provided in this study broadly overlap with the estimates given in the previous work (Perkins et. al. 2025).

In this study, a tree of 13 inches diameter would produce 1.5 lbs of additional syrup with two taps over that with a single tap. A 15-inch diameter tree would produce 1.8 lbs more syrup. At 18 inches, the size at which a second tap is recommended in revised tapping guidelines (Perkins et. al. 2022, Isselhardt 2023), 2.1 lbs of additional syrup would be produced with a second tap. At 20, 25, and 30 inches diameters, 2.3, 2.8, and 3.4 lbs of additional syrup would be gained respectively. At a bulk price of US$2.50 per lb, this represents an increase in gross profit of $5.23 at 18 inches diameter (ranging from $3.85 at 13 inches to $8.40 at 30 inches). If selling retail, the gross profit would be considerably higher. However, the additional cost in terms of materials (tee, dropline, and spout) as well as labor for tapping and leak-checking should be subtracted to determine net profit with a second taphole. Given that costs are highly variable among operations, we won't attempt to calculate net profit from these es

timates, but will instead leave it to producers to use this information to decide for themselves at what point it is appropriate to consider adding a second tap to trees.

It should be noted that the amount of internal compartmentalization could also impact the amount of sap produced. Trees that have been tapped for many decades or large trees that are internally hollow have less wood volume to produce sap during a flow period. This similarly applies to vacuum level. The higher the vacuum, the further sap will be moved within the stem. Lower vacuum will draw sap to the taphole from a smaller volume than high vacuum, thus impacting the amount of sap produced by each taphole.

Consideration should also be given to the growth rates of trees, which typically are low for large, mature individuals. Adding a second taphole may not always be sustainable in terms of new wood growth and identifying adequate tapping areas on the stem (van den Berg et. al. 2016), although keeping tapholes widely separated within the tapping band (opposite sides and high/low) tapping below the lateral (Perkins et. al. 2016, Rademacher et. al. 2024) along with other tapping practices may help reduce the problem of hitting nonconductive wood (van den Berg et. al. 2024).

A second tap also has a cost in terms of materials (dropline) and time to install/maintain. Once installed, the potential exists for neglecting to actually drill the second taphole during tapping. If an

operation is diligent about leak checking this oversight will likely be found early in the season. . If this goes unnoticed however, the loss of sap would extend beyond that theoretical 20-30% additional sap and impact all the trees along the lateral line until the mistake is fixed. The ultimate decision of "if" and "at what diameter" to add a second taphole must largely be a personal decision of individual maple producers based upon their production goals, the tapping history, site quality which in turn influences growth rate of the trees, and the sap collection technology employed in the operation .

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Table 1. Sap yield from one or two tapholes from 2019-2020 in red maple and 2021-2024 in sugar maple on high-vacuum. The "2:1 Tap Sap Yield shows the additional amount of sap produced with two tapholes above that of a single taphole. "Taphole Sap Yield" compares the amount of sap produced by each of the two tapholes. 100% indicates the tapholes produced the same amount of sap.

Year	Species	Average Diameter (inches)	Sample Size (# Trees)	Sample Size (# Chambers)	1 Tap Sap Yield (gal/tap)	2 Taps Sap Yield (gal/tap)	2:1Tap Sap Yield (ratio)	Taphole Sap Yield (ratio)
2019	Red Maple	15.1	16	24	40.3	49.1	21.8%	95%
2020	Red Maple	15.1	16	24	41.4	42.2	1.8%	92%
2021	Sugar Maple	15.8	20	30	29.8	39.4	32.2%	101%
2022	Sugar Maple	15.8	20	30	42.7	58.8	37.7%	100%
2023	Sugar Maple	24.7	20	30	62.1	76.2	22.7%	109%
2024	Sugar Maple	24.7	20	30	79.4	97.4	22.7%	166%

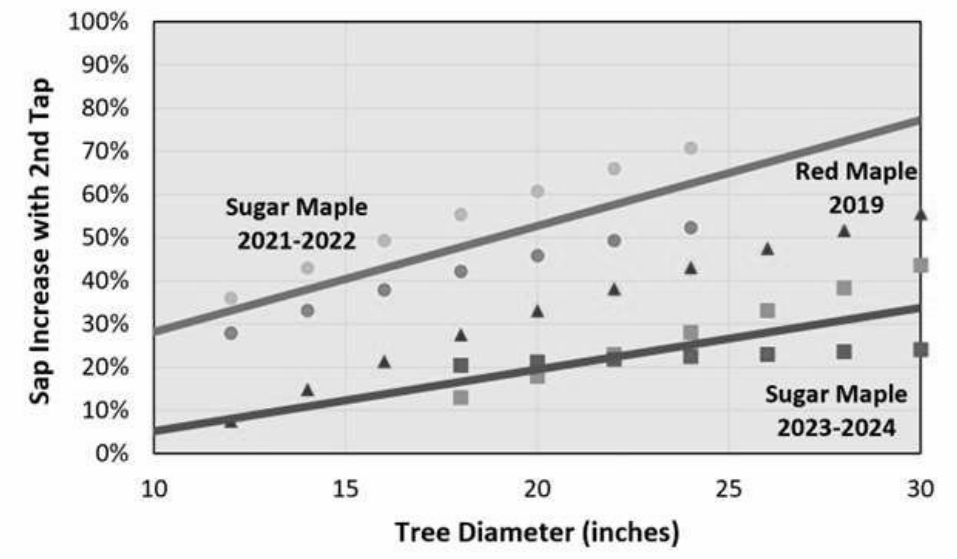

Figure 1. Estimated additional sap produced with two tapholes compared to a single taphole per tree across a range of tree diameters. Values were derived from regressions of sap yield increase with a second tap for red maple trees (2019) and sugar maple trees (2021-2024). Lines represent average linear fit for one set of sugar maple trees in 2021 and 2022 and for larger diameter trees in 2023 and 2024. Variations in the magnitude and slope of the lines probably reflects year-to-year differences in the number and type (low, moderate, high) of sap flows.

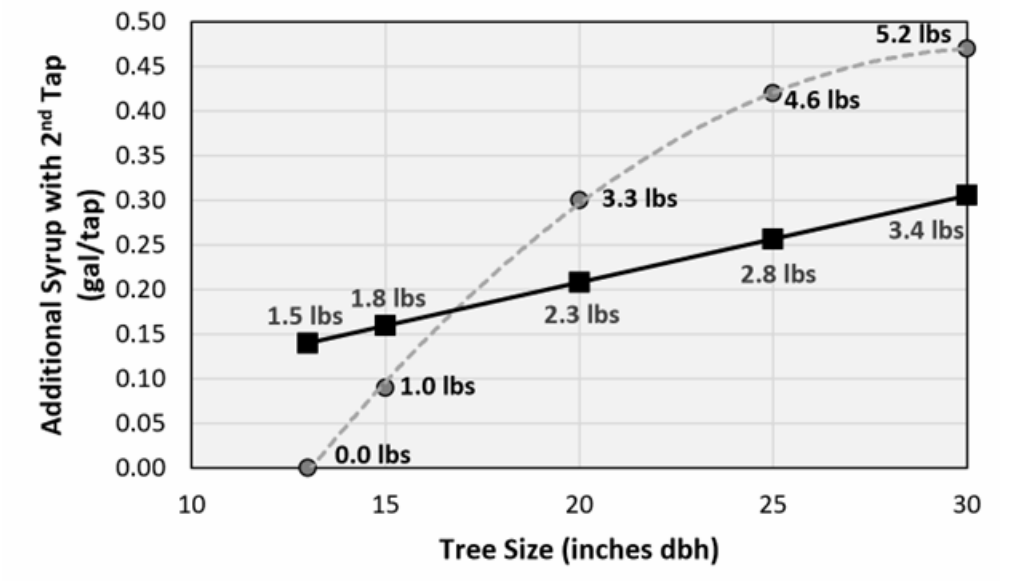

Figure 2. The amount of additional syrup in gallons per tap produced by a second taphole beyond that produced by a single taphole with high vacuum across a range of tree diameters. The squares and solid black line indicate the results of field studies from 2019-2024 described in this paper. The value accompanying each point is the gain in syrup in lbs/tap. The dashed curve shows the estimated results from the previous study (Perkins et. al. 2025, "When to Add a Second Tap Under Vacuum? – Part 1").

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Tiny Holes in Sap Lines and Spouts: A Mystery

Margaret Skinner, University of Vermont, Extension Entomologist

Back in February 2025, a sugarmaker with 23,000 taps in central Vermont emailed the "Ask Maple Research Contact" (askmaple@uvm.edu) about small holes in their tubing and spouts and sent samples of the damage (Fig. 1). This damage required replacement of the spouts and tubing to ensure efficient operation of the vacuum system and avoid sap leakage. As the University of Vermont (UVM) Extension Entomologist, the inquiry was ultimately forwarded to me. The big mystery is what makes these minute, perfectly-round holes (diameter of ~1/16 of an inch). If I didn't know better, I would say someone made the holes with a power drill. I contacted Dr. Tim Rademacher, Director of the UVM Proctor Maple Research Laboratory, asking if he had observed this damage before or knew the causal agent. He had heard of the issue and proposed they were made by a tiny beetle, Cnestus mutilates, the camphor shot borer, an exotic pest native to Asia. This beetle was first detected in Mississippi in 1999 and since then has been collected in most southeastern states and as far north as Pennsylvania (2013), Massachusetts (2023), Illinois (2011) and perhaps New York (Skvarla 2022, Barringer 2024). It is attracted to the scent of alcohol, and has been found feeding on gas tanks, presumably drawn to the ethanol adative in most gasoline (Wooden et al. 2020). Could this beetle be attracted to fermenting residual sap in the lines or

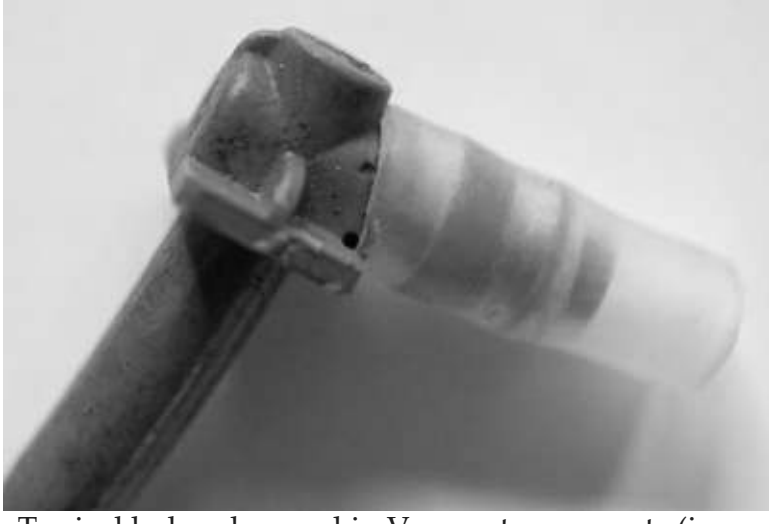

Fig. 1. Typical holes observed in Vermont sap spouts (image by S. Cho).

Hold On a Minute! There is no record of this beetle occurring in Vermont or other New England states north of Massachusetts, nor in Canada. Until we collect clear evidence of a link between the holes and this beetle, we can't say with confidence that this is the culprit. In addition, we need to determine how serious this problem is for sugarmakers. That is why we are conducting a an online survey to gather more information on a regional scale. So far we have received 35 responses (31% from VT, 23% from NY, and a few from Connecticut, Michigan, Minnesota, New Hampshire, Ohio and Wisconsin). Over 26% indicated they had noticed this type of damage in the past. Most of those who had observed damage in their operation rated the problem as minor, costing less than $500 to repair. Two sugarmakers considered it a moderate problem costing them $500-$1,000. When sugarmakers were asked if this topic should be investigated further, 62% said yes, and many of these were respondents who had not seen this type of damage before.this type of damage before. As a result of the survey, few sugarmakers contacted me to report this kind of damage. Two sent images showing a slightly different kind of damage, with short tunnels made in the tubing (Fig. 3). It is impossible to be sure, but this may be caused by the same organism or a different one. We are asking sugarmakers throughout North America to complete a survey to expand our knowledge about this problem. To complete the survey, go to:
https://qualtrics.uvm.edu/jfe/form/SV_elWzkqbMHiIjtyu

Fig. 2. Camphor shot borer. Image by R. Osborn, Southeast Asian Ambrosia Beetle ID, USDA APHIS PPQ, Bugwood.org).

Who Cares?

Those who have never noticed this damage might be thinking this is no big deal. However, if indeed the damage is caused by the camphor shot borer, that might be a cause for concern. Since its introduction into North America sometime before 1999, this species has been moving northward slowly. As our climate warms, it may become a a greater problem in the future (Ollatinwo et al. 2014). Practices used to sanitize sap lines may need to be developed to avoid ethanol odors. Furthermore, if isopropyl alcohol is legalized in the US to sanitize sap lines, it would be important to test if the treatment might attract the beetles making the holes. The camphor shot beetle doesn't just feed on sap lines. It has a broad host range of various hardwood trees, including red and sugar maple. Adult beetles make tunnels in branches of host trees less than 2 inches in diameter, where they lay eggs and cultivate a fungus on which the larvae feed. It is too early to say with certainty that the camphor shot borer is causing this damage, or if it is an issue that should concern sugarmakers. Data generated from the survey will help us determine that. Until then, sugarmakers should be on the lookout for the damage and report it, or send images and samples of the damage or suspect beetles to:

Margaret Skinner, Extension Entomologist Univ. of Vermont Entomology Research Laboratory 661 Spear Street; Burlington, VT 05405
mskinner@uvm.edu
Tel: 802-656-5440

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Great Lakes! Great Maple!
2025 North American Maple Syrup Conference
Conference - October 22nd to October 25th, 2025
Grading School - October 21st & October 22nd, 2025

On behalf of the North American Maple Syrup Council and Michigan Maple Syrup Association we would like to

invite you to join us at our Annual Meeting/Trade Show.

The event will be held at the Blue Water Convention Center located in Port Huron, Michigan. Port Huron sits on the St Clair River, which is the border between Ontario Canada and Michigan.

This location is approximately 1.5 hours via I-94 from Detroit Metropolitan Airport or approximately 1 hour via
I-69 from Flint Bishop International Airport.

We will be staying at the Double Tree by Hilton, Port Huron, Michigan - Blue Water Convention Center'
To save money on your room rate you can book your room now - be sure and tell them you are attending the NAMSC Convention by using Group Code: MSC!

Highlights of the event are; Quilt Raffle – Silent Auction - Trade Show – Antique Display – All Day Tours –Taste of Michigan Buffet – Syrup & Confectionary Contest – Photo Contest – Companion Tours – Technical Sessions

Tentative Schedule

Breakfast & Lunch on Thursday, Friday, & Saturday also dinner on Thursday & Friday are included with full registration.Breakfast & lunch on Friday or Saturday included with 1-day registration.

Tuesday, October 21st:
1st day of Grading School

Wednesday, October 22nd:
2nd day of Grading School
NAMSC Committee meetings
River Cruise Lunch 1 – 3 pm. (See details below)
River Cruise with hors d'oeuvres 5 – 7 pm. (See details below)

Thursday, October 23rd:
Breakfast included
Trade show set up
All Day tours
Taste of Michigan buffet with cash bar

Friday, October 24th:
Breakfast
Lunch
Companion tour (See details below)
NAMSC Annual meeting – 8:00 am – 9:30 am
Trade show all day – 8:00 am to 5:00 pm
Tech sessions – 10:00 – Noon / 2:30 – 5:00 pm
Buffet Dinner – Cash Bar

Saturday, October 25th
Breakfast
Trade show – 8:00am to 3:00 pm
Lunch
Companion tour (See details below)
Tech Sessions 8am - Noon / 1:00 – 4:00pm
Banquet, Awards, Auction items – Cash Bar

Tours and Events
Wednesday October 22nd
Huron Lady II Cruise
Take a moment to unwind and appreciate the beautiful sights of Port Huron from the water. Our journey begins at the Black River in Port Huron, proceeding south along the St. Clair River to admire the River Walk and the freighter docks in Sarnia. We then navigate north beneath the stunning Bluewater Bridges into Lake Huron, where you can view the Fort Gratiot Lighthouse, Michigan's oldest operational lighthouse, followed by a glimpse of the Huron Light Ship before returning to the Black River.
River Cruise Lunch 1 – 3 pm. Cost: $80
River Cruise with hors d'oeuvres 5 – 7 pm. Cost: $90

Companion Tours
Friday, October 24th - Pewabic Pottery and Edsel Ford Family Home Tour
Start your day off visiting the Museum & shop at Pewabic Pottery. It was founded in 1903 and is one of the oldest continually operating potteries in the country. You will have time to both view the amazing pottery and shop for some to take home with you. Leaving Pewabic Pottery we will travel to Grosse Pointe Shores where you can experience the historic family home of Edsel Ford, the only son of Henry Ford, and his wife, Eleanor.
The estate is located on a sprawling estate with beautiful grounds and gardens along the lakeshore. The estate includes the historic residence and outbuildings, 87 acres of ground and gardens which you can take your time exploring.

The house was designed by prominent architect Albert Kahn, known for his work on several iconic structures in Detroit and industrial design in Ford Motor Co. factories. The look of Edsel and Eleanor's house was inspired by Cotswold-style cottages in England. The family moved into their home in 1928.

Inside the House, the rooms feature classic western European interior design styles.Like many of us do, the Fords updated spaces in their home as time passed. In the 1930s, Edsel hired famed industrial designer and Ford Motor Company collaborator Walter Dorwin Teague to redecorate four rooms. Teague created rich and original designs using a sleek, modern Machine-Age aesthetic. Later in the 1950s after Edsel's passing, Eleanor hired friend and interior decorator Polly Jessup to design spaces that reflected her taste and highlighted her collection of fine art and antique furniture.

Around every corner, you can discover world-class art and design pieces collected by art-lovers Edsel and Eleanor. They displayed paintings by Vincent Van Gogh and Diego Rivera – a

personal friend of Edsel – classic European portraiture, modern-style sculptures, and ancient Asian and African artifacts.

$85.00 for the day includes lunch. See menu selections below:
Chicken Salad Croissant, grilled chicken breast, celery, dried cherries, mayonnaise, on a buttery
croissant

Turkey Sandwich, oven roasted turkey, red pepper, spinach, brie spread, balsamic strawberry preserves,
house made multi-grain bread.

Roasted vegetable wrap with creamy hummus, pickled red onion, roasted red and yellow peppers,
grilled zucchini, spinach, portobello mushroom, cucumber and tomato in a tomato lawash

Saturday, October 25th
Tour Frankenmuth Michigan
Travel to Frankenmuth where you can spend the morning visiting the unique shops in downtown Frankenmuth
as well as the River Shoppes.

After a delicious Frankenmuth Bavarian Inn Chicken Buffet lunch at the Bavarian Inn Lodge we'll then travel
to Bronner's Christmas Wonderland

Bronner's Christmas Wonderland started from humble beginnings in 1945, quickly growing through several expansions to become the World's Largest Christmas Store with beautifully landscaped grounds covering 27 acres. You will find Christmas items from around the world.

Bronner's features a fantastic selection of Christmas ornaments, trims, trees, Christmas lights, nativities, and collectibles. Christmas cards, garlands, stockings, Advent calendars, and wreaths are also among the many items available. Of the more than 6,000 styles of ornaments which Bronner's carries, half of the glass ornaments are Bronner's exclusive designs.

After a day shopping, we will head back to the Convention Center
$65.00 includes lunch

Tour Stop (More to come .....)
Thursday October 23, 2025
MapleWorxz™ will be hosting a tour of their third generation maple syrup sugar operation during the fall North American Maple Syrup Council (NAMSC) in October this year. The family has been involved in producing maple syrup since 1949 in a sugar shack that still has remnants in the maple woods today. In 2018, the maple operation was named MapleWorxz™ and became a registered trademark that continues to enhance our brand identity. In addition, the operation became USDA Organic Certified the same year which became a reality mainly due to its location in the middle of our 300 acre organic farm. The family taps 670 to 900 trees in its 38 acre Sugar Maple Woods and continues following many of the traditional syrup making methods passed on from past family generations. Our operation continues to be fired with wood, does not employ reverse osmosis and uses bags and pumping stations

lection. With the help of two other "like and kindred" spirited families and their children, the yearly maple syrup production ranges from the mid 180 to 240 gallons all depending on the typical maple sugaring factors of weather, season length and sap sugar ranges.

The farm address is 3540 North Hurds Corner Road, Caro Michigan and the Sugar House is located off Akron Road a quarter mile south from the intersection of North Hurds Corner with a gravel road and easily seen from the road.

2025 North American Maple Syrup Council
66th Annual Conference
Great Lakes! Great Maple!
October 22 – 25, 2025
Double Tree by Hilton, Port Huron, Michigan
Blue Water Convention Center
CONFERENCE REGISTRATION FORM

	Before 9/1	Before 9/20	After 9/20
Full Registration Includes all workshops and presentations, trade show, program book and the following: Thursday all day tour; Welcome to Michigan Buffet; Thursday, Friday, Saturday breakfast; Friday and Saturday lunch; and Friday dinner	$475 #_____	$500 #_____	$550 #_____
Friday One Day Only Registration Includes trade show, meetings, tech sessions, breakfast, lunch and program book ***Dinner is extra**	#_____	$125	$150
Saturday One Day Only Registration Includes trade show, tech sessions, breakfast, lunch and program book ***Banquet is extra**	#_____	$125	$150
Saturday Evening Banquet Banquet will be buffet style with choices of beef, maple glazed salmon and chicken	#_____	$85	$90
Friday Companion Tour Tour of Pewabic Pottery and historic family home of Edsel Ford – tour includes lunch. Indicate lunch choice: Chicken salad croissant #___ Turkey sandwich #___ or Roasted vegetable wrap #___	#_____	$85	$90
Saturday Companion Tour Spend a day in Frankenmuth; downtown shops and visit to Bronner's Christmas Wonderland – tour includes lunch	#_____	$65	$70
Wednesday Optional Riverboat Cruise Cruise from 1:00-3:00 PM and includes lunch; cash bar available	#_____	$80	$85
Wednesday Optional Riverboat Cruise Cruise from 5:00-7:00 PM and includes heavy hors d'oeuvres; cash bar available	#_____	$90	$95

No cancellation refunds after October 1st
Total amount enclosed $_____
A 3% charge will be added to credit card payments
Name(s): _____

_____

Sugarhouse/Company name: _____

_____

Address: _____

_____

City, State/Province: _____
___ Postal/Zip: _____
Phone:_____ Email: _____

_____

Payment to be made in U.S. dollars and must accompany this form.
Send form and check made payable to MMSA to: Jill Brown, 34233 38TH Avenue, Paw Paw, MI 49079

USDA AGRICULTURE COUNTS

Crop Production

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Maple Syrup Acreage, Taps, Yield, and Production – States and United States: 2023-2025

State	Acreage			Number of taps			Yield per tap			Production		
	2023	2024 [1]	2025	2023	2024	2025	2023	2024	2025	2023	2024	2025
	(acres)	(acres)	(acres)	(1,000 taps)	(1,000 taps)	(1,000 taps)	(gallons)	(gallons)	(gallons)	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)
Connecticut [1]	(NA)	2,800	2,300	(NA)	60	61	(NA)	0.186	0.148	(NA)	11	9
Indiana [1]	(NA)	3,300	4,000	(NA)	95	90	(NA)	0.228	0.272	(NA)	22	24
Maine	(NA)	21,500	19,900	1,880	1,900	1,760	0.250	0.369	0.312	470	701	549
Massachusetts [1]	(NA)	4,600	4,500	(NA)	200	190	(NA)	0.244	0.248	(NA)	49	47
Michigan	(NA)	11,300	9,800	620	650	680	0.330	0.308	0.298	205	200	203
Minnesota [1]	(NA)	3,700	3,200	(NA)	96	77	(NA)	0.271	0.308	(NA)	26	24
New Hampshire	(NA)	11,200	11,500	490	520	520	0.303	0.286	0.292	148	149	152
New York	(NA)	60,000	55,500	2,500	2,800	2,700	0.300	0.302	0.307	750	846	829
Ohio [1]	(NA)	12,300	10,200	(NA)	400	420	(NA)	0.240	0.245	(NA)	96	103
Pennsylvania	(NA)	13,700	13,400	780	790	780	0.263	0.231	0.251	205	182	196
Vermont	(NA)	141,000	140,500	8,100	8,400	8,350	0.322	0.370	0.367	2,608	3,108	3,064
West Virginia [1]	(NA)	2,200	2,200	(NA)	70	68	(NA)	0.171	0.215	(NA)	12	15
Wisconsin	(NA)	31,100	30,400	1,120	1,140	1,200	0.408	0.402	0.463	457	458	556
United States	(NA)	318,700	307,400	15,490	17,121	16,896	0.313	0.342	0.342	4,843	5,860	5,771

(NA) Not available.
[1] Estimates began in 2024.

Maple Syrup Price and Value – States and United States: 2023-2025

[Blank data cells indicate estimation period has not yet begun]

State	Average price per gallon			Value of production		
	2023	2024	2025 [1]	2023	2024	2025 [1]
	(dollars)	(dollars)	(dollars)	(1,000 dollars)	(1,000 dollars)	(1,000 dollars)
Connecticut [2]	(NA)	81.70		(NA)	899	
Indiana [2]	(NA)	41.00		(NA)	902	
Maine	31.30	39.50		14,711	27,690	
Massachusetts [2]	(NA)	57.30		(NA)	2,808	
Michigan	41.70	40.30		8,549	8,060	
Minnesota [2]	(NA)	48.50		(NA)	1,261	
New Hampshire	50.20	53.50		7,430	7,972	
New York	35.40	34.20		26,550	28,933	
Ohio [2]	(NA)	41.30		(NA)	3,965	
Pennsylvania	37.00	38.40		7,585	6,989	
Vermont	30.60	30.70		79,805	95,416	
West Virginia [2]	(NA)	47.50		(NA)	570	
Wisconsin	31.80	32.60		14,533	14,931	
United States	32.90	34.20		159,163	200,396	

(NA) Not available.

[1] Price and value for 2025 will be published in *Crop Production* released June 2026.

[2] Estimates began in 2024.

Maple Syrup Sales by Type – States and United States: 2023 and 2024

State	Retail		Wholesale		Bulk		Value Added	
	2023	2024	2023	2024	2023	2024	2023	2024
	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)
Connecticut [1]	(NA)	6	(NA)	(D)	(NA)	(D)	(NA)	1
Indiana [1]	(NA)	9	(NA)	(D)	(NA)	(D)	(NA)	1
Maine	29	46	68	43	356	602	17	10
Massachusetts [1]	(NA)	23	(NA)	15	(NA)	6	(NA)	5
Michigan	59	50	64	59	79	87	3	4
Minnesota [1]	(NA)	8	(NA)	7	(NA)	10	(NA)	1
New Hampshire	33	26	80	92	27	27	8	4
New York	149	124	105	115	466	575	30	32
Ohio [1]	(NA)	38	(NA)	25	(NA)	32	(NA)	1
Pennsylvania	78	39	33	32	82	99	12	12
Vermont	210	203	119	144	2,228	2,726	51	35
West Virginia [1]	(NA)	4	(NA)	(D)	(NA)	(D)	(NA)	1
Wisconsin	51	46	41	35	353	371	12	6
Other States [2]	-	-	-	14	-	9	-	-
United States	609	622	510	581	3,591	4,544	133	113

- Represents zero.
(D) Withheld to avoid disclosing data for individual operations.
(NA) Not available.
[1] Estimates began in 2024.
[2] Includes data withheld above.

Crop Production (June 2025)
USDA, National Agricultural Statistics Service

Maple Syrup Retail and Wholesale Price – States and United States: 2023 and 2024

State	Retail		Wholesale	
	2023	2024	2023	2024
	(dollars per gallon)	(dollars per gallon)	(dollars per gallon)	(dollars per gallon)
Connecticut [1]	(NA)	91.20	(NA)	(D)
Indiana [1]	(NA)	47.00	(NA)	(D)
Maine	69.80	68.30	41.90	52.00
Massachusetts [1]	(NA)	67.80	(NA)	50.80
Michigan	56.80	57.30	44.30	45.80
Minnesota [1]	(NA)	71.60	(NA)	51.60
New Hampshire	65.00	67.40	53.70	57.70
New York	54.10	56.70	43.40	48.70
Ohio [1]	(NA)	50.50	(NA)	43.60
Pennsylvania	47.10	60.40	42.00	45.80
Vermont	57.20	58.30	40.80	42.30
West Virginia [1]	(NA)	62.10	(NA)	(D)
Wisconsin	52.90	59.30	46.40	49.50
Other States [2]	(X)	(X)	(X)	48.00
United States	55.80	59.50	44.50	48.20

(D) Withheld to avoid disclosing data for individual operations.
(NA) Not available.
(X) Not applicable.
[1] Estimates began in 2024.
[2] Includes data withheld above.

Maple Syrup Bulk Price – States and United States: 2023 and 2024

State	Bulk all grades		Bulk all grades	
	2023	2024	2023	2024
	(dollars per pound)	(dollars per pound)	(dollars per gallon)	(dollars per gallon)
Connecticut [1]	(NA)	(D)	(NA)	(D)
Indiana [1]	(NA)	(D)	(NA)	(D)
Maine	2.37	3.30	26.10	36.40
Massachusetts [1]	(NA)	3.04	(NA)	33.50
Michigan	2.56	2.42	28.20	26.70
Minnesota [1]	(NA)	2.52	(NA)	27.80
New Hampshire	1.98	2.32	21.80	25.60
New York	2.50	2.40	27.60	26.40
Ohio [1]	(NA)	2.60	(NA)	28.70
Pennsylvania	2.30	2.48	25.30	27.30
Vermont	2.50	2.54	27.60	28.00
West Virginia [1]	(NA)	(D)	(NA)	(D)
Wisconsin	2.46	2.51	27.10	27.70
Other States [2]	(X)	3.10	(X)	34.40
United States	2.50	2.60	27.30	28.90

(D) Withheld to avoid disclosing data for individual operations.
(NA) Not available.
(X) Not applicable.
[1] Estimates began in 2024.
[2] Includes data withheld above.

Crop Production (June 2025)
USDA, National Agricultural Statistics Service

Maple Syrup Grade – States and United States: 2023 and 2024

State	Grade A		Processing Grade	
	2023	2024	2023	2024
	(gallons)	(gallons)	(gallons)	(gallons)
Connecticut [1]	(NA)	9,400	(NA)	600
Indiana [1]	(NA)	19,950	(NA)	1,050
Maine	413,136	666,124	39,864	24,876
Massachusetts [1]	(NA)	41,052	(NA)	2,948
Michigan	198,970	187,572	3,030	8,428
Minnesota [1]	(NA)	24,750	(NA)	250
New Hampshire	136,080	140,070	3,920	4,930
New York	689,760	765,974	30,240	48,026
Ohio [1]	(NA)	86,450	(NA)	8,550
Pennsylvania	176,016	163,370	16,984	6,630
Vermont	2,500,746	2,986,956	56,254	86,044
West Virginia [1]	(NA)	10,912	(NA)	88
Wisconsin	436,100	442,960	8,900	9,040
United States	4,550,808	5,545,540	159,192	201,460

(NA) Not available.
[1] Estimates began in 2024.

Maple Sap Sales and Price – States and United States: 2023 and 2024

State	Sap Sales		Sap Price	
	2023	2024	2023	2024
	(gallons)	(gallons)	(dollars per gallon)	(dollars per gallon)
Connecticut [1]	(NA)	-	(NA)	(X)
Indiana [1]	(NA)	-	(NA)	(X)
Maine	(D)	(D)	(D)	(D)
Massachusetts [1]	(NA)	42,500	(NA)	0.33
Michigan	193,650	(D)	0.34	(D)
Minnesota [1]	(NA)	(D)	(NA)	(D)
New Hampshire	260,000	322,000	0.28	0.24
New York	1,419,000	475,000	0.23	0.17
Ohio [1]	(NA)	101,000	(NA)	0.36
Pennsylvania	(D)	-	(D)	(X)
Vermont	8,447,000	10,363,000	0.31	0.29
West Virginia [1]	(NA)	(D)	(NA)	(D)
Wisconsin	1,502,000	1,760,000	0.33	0.32
Other States [2]	172,000	383,400	0.22	0.30
United States	11,993,650	13,446,900	0.30	0.30

- Represents zero.
(D) Withheld to avoid disclosing data for individual operations.
(NA) Not available.
(X) Not applicable.
[1] Estimates began in 2024.
[2] Includes data withheld above.

Crop Production (June 2025)
USDA, National Agricultural Statistics Service

2025 Crop Reports From NAMSC Members

Conneticut
Results across the state generally below average with very few exemptions.

Most sugar makers did not boil in February. They had tapped early in hope of catching the early run but it was to cold .

Early March it warmed up to fast. We had about two weeks to make sytup. The syrup was very dark. The flavor was good. Some producers said there was very little sugar in the sap where others said it was normal.

The Southern part of the state said they had a good year.
The Connecticut open house were well attended. There was alot of interest and sales were good.

AG Day at the capitol was held in Mid-Marcg and was very well attended. Each Legislature and Goverment Officials recieved a bottle of Maple Syrup.

Richard Norman, Conneticut

Indiana
This year has been a little different than most year's. Some started in late January than it froze up for about 3 weeks. Those that tapped early didn't make a lot more than those that tapped later. I expected those that using buckets or bags that tapped in January would have dried out but it didn't seem to affect it.

The south did better this year than the north in pounds per tap . By what I was hearing the south was around 70-90 percent of normal. In the north half was around 60-70 percent of normal.

The Sugar content seemed good over the whole state. It was a little higher than last year . The flavor of the syrup was way better this year over last year. Overall the colour of the syrup was darker,very little golden delicate made . It seemed the syrup was a little harder to filter this year.

The season lasted about 2-3 weeks which is short for our area. We had no huge runs this year,just steady one's.
Syrup sales are strong here in our state. The sales surpass our productions . This means our state buys from other areas.

Dan Winger, Indiana.

Massachusetts

Massachusetts sugarmakers experienced a later start to the sugar season with the first boil being at the end of February after having a cold month. The more "traditional" winter gave a very optimistic beginning but with the warm spikes many ended earlier than expected. As always there were a few that reported above average season, but the majority reported about 75 – 80% of an average crop with sap at lower sugar content and produced darker grades.

Our March is Massachusetts Maple Month kickoff was held Friday, February 28th in Warren with the reading of the proclamation from Governor Healey declaring March to be Maple Month in Massachusetts. Deputy Commissioner, Winton Pitcoff tapped the ceremonial first tree with host Richard Julian of Deer Meadow Farm. There were about 30 attendees including legislatures, Ma Dept. of Ag. Resources, Ma Office of Travel & Tourism, fellow maple producers, and friends.

Ma Maple continues to promote sugarhouse and sugarhouse restaurant visits throughout the season. The Department of Agricultural Resources with commissioner, Ashley Randle toured three sugarhouses this year to highlight Ma Maple syrup across the state. Maple Weekend was held March 8th & 9th with over 30 sugarhouses celebrating, mostly reporting nice turnout and sales.

Massachusetts Ag Day at the state house was March 18th (which was National Ag Day). We had four sugarhouses represent the association serving maple hot chocolate and handing out maple candy. This year's event had an excellent turnout with many legislatures visiting our booth. We even got a picture with Deputy Commissioner, Winton Pitcoff.

Our annual meeting in January gathered over 130 producers to collaborate, visit with vendors, get hydrometers tested, learned about the Mass Audubon Society's bird friendly program, and the afternoon workshop was a direct marketing presentation by Colt Knight from UMaine

We continue to operate our booth in the Massachusetts Building at the 17-day Eastern States Exposition as well as a booth at the Franklin County Fair. The main priority is outreach and education about the Massachusetts maple industry and promoting our members. The profit from the Eastern States Exposition provides us with funds for the coming year. The booth sells candy, cream, and syrup, as well as cream cones, maple cotton candy, and maple slushies, which have proven to be very popular. This past year's new product that was offered were maple cream frosted donuts.

We host a summer picnic every year and have planned 2025's picnic lunch at the Conway Sportsman's Club with a chicken barbeque and will have several nearby sugarhouses open to visit before lunch, more details to come.

We continue to use Facebook to promote the industry, encourage sales

through our member directory, and post articles featuring maple syrup as an ingredient, as a way of demonstrating our product's versatility and encouraging more use.

Melissa Leab, coordinator
Massachusetts Maple Producers Association

Minnesota

Minnesota is approximately 400 miles (640 KM) from its southern border with Iowa to the northern border with both Ontario and Manitoba. Maple syrup is produced from border to border, south to north.

Minnesota's season normally occurs within a three-to-four-week window in March and April. Typically, our southern-most producers are three to four weeks ahead of our northern-most producers. Southern producers frequently wrap up their season before those in the north have experienced their first boil.

The 2025 season followed this pattern, but a cold winter, deep frost, and modest snow cover delayed the start of the season in much of the state. This was particularly true when compared to the unusual 2024 season-start in January and February. Many hobbyists new to sugar-making were frustrated with the "late" season start compared to 2024, when in reality it was a more normal start-finish cycle.

Much of the central and western regions of the state received a 2" rain (or 10" wet snow) event in mid-March which drove the frost out for many producers. Those who got the precipitation seemed to have a great season, but those in the east and northern areas did not do as well by comparison. For producers in the northeast along the north shore of Lake Superior, the season started slow, but picked up with strong late-April runs

Overall, Minnesota maple producers experienced satisfactory 2025 production results, described as average to above average and even excellent. The 2025 crop was lighter than 2024, with producers reporting more golden-delicate produced than the dark-robust and very dark-strong classes. This was confirmed by the number of entries in each class at the May 17 MMSPA spring membership meeting when very few dark or very dark samples were entered. Syrup produced in the northeast region was reported as "…all very tasty Amber-Rich grade, except last boils, which was Dark but good flavor". Minnesota producers continued to report favorable state-wide sap sugar content in the 2.5 – 3+% range over the course of the season.

Association Activities
The MMSPA has steadily recovered from the Covid shut down of 2020 and 2021. The traditional spring and fall membership meeting attendance has steadily recovered and memberships continue to slowly climb. The Association again had a one-day presence at the 2024 Minnesota State Fair, with volunteers staffing the "Minnesota Grown" (Dept of Ag) Maple Syrup Day booth. Members of the MMSPA also

serve as judges for the State Fair maple syrup contest.

In October of 2024, the MMSPA contracted with the IMSI maple grading school to conduct a 1-day Advanced Maple Quality Workshop, the day before the regular fall MMSPA membership meeting. Nineteen maple producers signed up for the class which was taught by maple Extension Specialists from the University of Maine and the University of Vermont. Lectures and discussion were presented remotely via Zoom by Jason Lilley (UVM) and Mark Isslehart (ME) using high tech AV camera and audio equipment. One class participant indicated "…it was just like Jason and Mark were there in the classroom with us. They would lecture, we would ask questions, interact or debate a topic, and then they would send us off to work through hands-on demonstrations with the assistance of local class organizers".

The MMSPA board has continued to support two association members in their dispute with the MN DNR (Dept of Natural Resources) over an abrupt termination of their maple tapping lease agreement. For over 20 these producers have tapped maples on 15 acres of state land under a formal lease agreement. At the heart of the dispute is the apparent bias within the local DNR office towards timber interests versus maple producers. It is a frustrating "David (maple sap) versus Goliath (timber harvesting)" situation. While an extension for the 2025 season was accomplished, there is no long-term resolution as of this writing.

Stu Peterson, Minnesota'

New Brunswick
Our season was very much an average season with some doing exceptionally well while there were a very select few that only got maybe half a season.

Dave Briggs, New Brunswich

New Hampshire
The entire North East is well aware of the drought we all experienced during the summer and fall of 2024. The entire forest suffered and our maples in particular went into dormancy under stress. The winter while still not particularly bountiful of precipitation was at least seasonally cold for a change unlike recent past years frost was consistent and deep. Deep snow didn't present itself until just before it was time to tap

Early tapping wasn't attempted by many and those who did were disap

pointed as the first runs didn't occur until March 1st I in the southern part of the State and March eleventh in the North country. Unseasonably warm weather presented itself on the third week in March and stopped all sap flow in the South and the gravity flow never recovered resulting in the poorest crop in many years to those effected without vacuum. While Southernmost producers pulled taps after the third week in March, Northern most producers held on until the third week in April. The short southern season of three weeks played against the Northern regions more normal six-week season.

Two of our reporting producers reported making more golden syrup than in past years, but the majority reported making none at all. Less amber syrup was produced universally, more dark, but no extra dark syrup was reported as being produced.

Lowest sugar content was reported early on (1.4%) with percentages increasing as the season progressed up to a reported high of (3.75%)..

More producers reporting the installation of vacuum and all reporting producers reported the use of reverse osmosis.

Compiled and submitted by David Kemp N.H. Rep.

New York

The New York State Maple Producers have had a mysteriously abnormal maple syrup season, to say the least. Expectations ran fairly high late last year and early in 2025 while we seemed to be witnessing what many producers labelled as an "old fashioned winter" – one with ample snowfall, frozen ground, lakes well frozen over and a general winter blusteriness usually accompanying good sugar seasons to follow. What followed however for most of the State was a syrup season to be placed in the record book under the heading of "not so much and not so good!" South of interstate 90 which includes Western, Central, the Catskills and the Hudson River areas, producers are reporting 40-65% of a crop or anywhere from 2.4-3.8 lbs/tap. North of Interstate 90 into the Adirondacks and along the St. Lawrence River production at this writing (10 April) is still occurring like regions of northern Wisconsin, Upper Michigan, northern Maine and Quebec. Our northern producers expect to harvest a six pound crop if this return to winter holds for the next 10-12 days.

Start of season found some early sugarmakers harvesting syrup on New Year's Day and then not again until very late February. Most western New York producers had first boil around the first of March which co-incidentally was the end date for harvest the previous year. Most of the lower State production was carried out over an intense three week run, ending just prior to our second MapleWeekend. All producers have reported historically low sap sugar content ranging from 0.7 degrees Brix to

just over 2.0 degrees Brix. Sugarbushes typically harvesting 2.8-3.2 degrees Brix marginally broke 2.0 degrees Brix and never recovered. Late season filtration of syrup was onerous, frustrating and time consuming. Widely reported RO membrane fouling was commonplace. State-wide, very little Golden delicate and sparse Dark Robust or Extra Dark Strong table syrup was produced and seems to be in significant demand.

Sales and visitation numbers reported for the New York State MapleWeekend festivities were reported as brisk and record setting, even though the weather in many areas of the State was less than ideal and many if not most producer hosts were boiling water. New York MapleWeekend(s) just completed their 29th year of hosting this event, having risen from ten original sugarhouses its first year to 159 facilities and active participants with tens of thousands of visitors across the State. This educational "Forest to table" whim from nearly three decades ago has morphed into a massive maple outreach, social media and product distribution success.

While the 2025 maple syrup season for New York State will be a "wrap" by the time this report sees print, the industry as a whole seems to be robust and growing. There is no shortage of new maple start-up operations, both large and modest. Farm gate sales opportunities and year- round maple focused businesses seem to be increasing as well as several "elegant-not your average pancake house" maple themed restaurant venues have opened in many areas of the State.

In summary, if we knew what we were doing or how it was going to finish - - we wouldn't be sugarmakers and most probably we wouldn't have done it this year.

Submitted by: Eric Randall, NAMSC Delegate, New York

Ohio

During 2025 maple season, Ohio was really stuck in the middle as far as the weather was concerned. While northeast Ohio was on the cold side, Central and Southern Ohio benefited from warm air occasionally pushing up from the Gulf. This gave many producers in the central and southern counties favorable weather, and in most cases above normal production. This was a nice turn of events, considering the conditions over the last two years that resulted in average to below average production. In Southern and Central Ohio tapping started in January for the southern counties to mid-February for the central counties. The season wrapped the third week of March. This was two weeks longer than 2024. This gave the downstate producers almost two months of production.

In Northeast Ohio it was a different story. For most producers the season was underway by the last week of February. The temperatures went for the low 20's to 65 degrees F in the first week. When you have that kind of change in weather, you often experience large volumes of sap coming in at one time. Dealing with a flood run can be frustrating, especially at the very beginnin

of the season when everything may not be in tune. The Ray Gingerich family at Deer Run Maple, in Ashtabula County, knows how to handle a big run. Ray's son Dan said, "this year they made over 70% of their crop, in two weeks". Dan's father Ray said that added up to 3500 gallons of syrup. This proves that my dad was right, when he told me, "You can make a lot of syrup in two weeks". Many local producers managed to produce syrup over the entire month. of March, overcoming the unusual swings in weather.

The color of the syrup was a little darker than last year. There was an abundance of Amber syrup made. The flavor for the most part was very good. That changed slightly as the season went on. You could pick out a hint of what I call late season flavor. The main reason for the flavor change was the increase in temperatures (above 50 degrees F) during the day and especially at night. Temperatures near 50 degrees are ideal for microbial growth. There is an explosion of bacterial growth in your lines and storage tanks. Sap and especially, concentrated sap, spoils rapidly.

The sugar content of the sap was better this year. Last year the brix level was low, 1.5 %.

This year it was a little better, averaging just under 2 percent and that helped improve the yield per tap. For the most part we have seen a decline in sap sugar percentage over the last several years. You might blame that on seasonal differences. Another acceptable reason for sugar content decline may be that we are tapping more Soft Maples, (Red and Silver Maples), that are known for lower sugar percentages. Geauga County Maples are primarily all Sugar maples but move outside of Geauga, that is not the case. Downstate tapping Soft Maples is becoming more and more prominent.

Les Ober
Extension Educator ANR
NE Ohio Maple Program Coordinator
Geauga County OSU Extension

Ontario

The Maple industry definitely enjoyed a more traditional season this year, with many starts and stops. Production started in February in the Southern Regions and continued until the end of April in the Northern Regions. Overall, the sap sugar content was slightly lower throughout the province. For a change, there wasn't much regional disparity throughout the province. Overall production was at least an average to slightly above average yield across Ontario.

All grades of syrup were made, but makers produced predominately Amber/Rich taste syrup, and to a much lesser extent Dark.

An ice storm swept in late in the season, and that weather event affected some producers dramatically in the Georgian Bay Region. Luckily most of the province remained unscathed. But for some of these producers it will take years to recover from the damage wrought by the storm.

Ontario's Maple Weekend always takes place the first weekend in April; this year the event was dramatically affected by this ice storm. Some producers were damaged too badly to welcome visitors, on account of unsafe conditions. However, the Elmira Maple Syrup Festival is reporting that 60,000 people attended a one day event, and a record $68,000 was raised for donation to local charities.

Ontario's Summer Tour is being held July 9-12 in Cornwall. If you are in the area we would love to see you!

Brian Bainborough
NAMSC President and Ontario

Vermont

The 2025 Vermont maple season resulted in another large crop of syrup. According to the USDA NASS report, Vermont producers made a total of 3.064 million gallons of syrup from 8.35 million taps in 2025. This is just 44,000 gallons below last year's impressive crop. The taps were set across a total of 140,500 acres of sugarbush which represents 45% of all the acreage in the U.S. The yield (gallons syrup/tap) was also similar to the year previous at 0.367, a value second only to Wisconsin (0.402). As anyone who has engaged in this activity can attest, each season has its own unique twists and turns and just because two years have similar production doesn't mean that number was reached with similar weather. It just so happens that 2025 will go down as be eing like an "old time Vermont winter" with few if any thaws and snow that continued to accumulate without hav ing a chance to compact. This "bottomless powder" made tapping very slow and reports of sugar makers sinking up to their thigh or even waists (while wearing snowshoes) resulted in lots of tired legs. Reports from producers around the state (and nearby locations) suggest that most operations hit their anticipated targets and those that didn't end up with as much syrup as they expected often cited stretches of unseasonably warm weather in the middle half of March as the culprit. Similar to 2024 operations in warmer locations across Vermont, saw a return to more seasonable temperatures in April but it appears that the warm weather had already taken it's toll on the sanitation of tap holes and days with nearly ideal temperature fluctuations arrived, sap flow didn't recover. . Many operations (including the sugar makers at University of Vermont Proctor Maple Research Center) saw one of the largest runs of sap on record in March. The production over that run was in excess of 2 gallons of sap/tap. Of course not all locations were buried in sap throughout the season. Within those operations that did not hit targets it appears that the final tally was somewhere between 75-90% of the expected crop with a few in the warmest locations struggling to exceed half of the expected production. .Many producers reported making light colored syrup and in a few cases; "the lightest we have every produced". Many producers reported having issues with "minerals" impacting the performance of their RO membranes. This was a new phenomenon for some whereas other producers expect to see this at some point during their season.

Despite the many challenges posed by weather, equipment failure and the vagaries of sugaring, producers across Vermont able to deliver a solid crop of quality syrup. After taking time to clean up and recover, many are already looking ahead to 2026 and preparing for the next season.

Mark Isselhardt, UVM

State	Production	Acreage	Yield (Syrup/Acre)
VERMONT	3,064,000	140,500	22
NEW YORK	829,000	55,500	15
WISCONSIN	556,000	30,400	18
MAINE	549,000	19,900	28
MICHIGAN	203,000	9,800	21
PENNSYLVANIA	196,000	13,400	15
NEW HAMPSHIRE	152,000	11,500	13
OHIO	103,000	10,200	10
MASSACHUSETTS	47,000	4,500	10
INDIANA	24,000	4,000	6
MINNESOTA	24,000	3,200	8
WEST VIRGINIA	15,000	2,200	7
CONNECTICUT	9,000	2,300	4
US TOTAL	**5,777,100**	**307,700**	**19**

Wisconsin

The 2025 Wisconsin winter was very cold with little to no snow. Early winter became very cold, and the lack of snow cover set frost in the woods to a very deep depth. The weather started warming up at the end of February, setting the maple season up for another early start. With the early start of season, we saw warm temperatures very early on in the season which started the clock ticking on the maple trees going from dormancy heading toward bud break. Mid-February was a flurry of activity for most producers from getting tapped in for the early start and getting the sugar houses ready to go. The cold weather gave the state a nice bump in sugar content with most producers seeing incoming sugars from 2.2 to 2.6 brix. Overall the state had a good maple season with the crop being 75% to 110% of a crop depending upon your location.

The producers in the southern third of the state had a particularly good crop. Warmer weather conditions thawed the ground, and the season started off very quickly. Production in this area of the state was good for most producers with the majority of the crop being produced in March. Large runs allowed producers to make a lot of syrup in a noticeably short time. The syrup Flavor was excellent with most of the syrup being in the Amber category. Production in the southern third of the state concluded for most producers by the last week of March.

The central part of the state made about 75% to 100% of a crop depending on the producers location. The father west that you were in Central Wisconsin the weather was much warmer and that lead to larger crops. The production season started the last week of February for most producers in this area. Sugar content was good as well with brix readings around 2.5 for 75% of the season. Syrup quality was good in with most of the syrup made in the Golden and Amber category. Most producers in central Wisconsin finished the season the first week of April with a few producers holding on until the second week of April.

The northern third of the state started at the same time as Central Wisconsin. The season was one of start and stop in the northern section of the state. Producers in northern Wisconsin experienced very large runs when it did warm up and were caught off guard with some of the large volumes of sap. The Northeast section of the state was hit with a large ice storm that started on March 22nd for some producers. The morning of March 22nd I awoke to a layer of ice on all of the trees that was an 1/8" thick, 24 hours before the ice storm warning began. The bulk of the freezing rain took place on Sunday the 23rd with ice accumulations up to 7 tenths of an inch. We experienced over one hundred thousand people and businesses that did not have electricity by Monday morning in Northeast Wisconsin as the temperatures cooled, rain turned to snow and the winds picked up.

The Wisconsin Maple Syrup Producers Association has a very busy activities

throughout the calendar year. The Wisconsin Maple Syrup Producers Winter Institute and Trade Show was held January 2nd and 3rd Marshfield, Wisconsin. The event included clinics and Jason Lily from the University of Maine as guest speakers on Friday evening and Saturday.

The next stop for the Wisconsin Association was the Roth Sugar Bush open house which was February 5th through the 8th in Cadott, Wisconsin.

The Association had its annual first tree tapping at Bear Paw Sugar Bush in Mountain WI, March 22nd, 2025.
The Association attended the Phelps Maple Festival on April 26th to promote the Association and the benefits of being a member.

The Wisconsin Association will have its annual meeting on May 3rd at Hotel Marshfield. This event will be the annual business meeting and syrup judging for the Wisconsin Association.
The Wisconsin Association will be at the Wisconsin State Fair July 31st through August 10th selling Wisconsin maple products and promoting the maple industry at the State Fair in West Allis, Wisconsin.

Submitted.

Jim Adamski
Wisconsin Maple Syrup Producers Association

International Maple Hall of Fame Nominations Open

The selection committee of the International Maple Hall of Fame (HofF) induction honor has opened up the nomination process for inductees into the 2026 Hall of FameNormally 2 inductees are honored.

Nominators are invited to submit a letter of nomination outlining why their candidate deserves consideration for the award. Specifically, the nomination needs to include:

- The background of the accomplishments of the individual that relates to the betterment, improvement and advancement of the maple industry.
- A sound explanation of what the individual has contributed to the State, Provincial, and most importantly the international level, with demonstrable proof of the stated advances made by their contribution.
- Examples of their continued contributions(if applicable) to the maple industry even if they have “retired” from their said roles and responsibilities from their employer, agency or association(s).
- Post humous nominations will be considered on a case by case basis but are discouraged.'

Submissions are to be sent to:
Ray Bonenberg, Chair, Nominations Committee by September 15 th 2025
maplesidesugarbush@gmail.com

Request for Proposals: NAMSC Education Grants

North American Maple Syrup Council member associations are invited to apply for grants, up to $5,000, to support educational projects meant to help maple producers make high-quality products safely, efficiently, and sustainably. The types of projects we will consider include, but are not limited to workshops, written materials, and videos that provide clear instructional guidance for implementing best practices and proven innovations. Topics related to any element of the production of pure maple products are welcome, including, but not limited to, forest management, tapping, sap collection, syrup production, and value-added products. The goal of these projects is to build a shared library of resources regarding the practical application of best practices, in order to improve the quality of pure maple products being produced by sugarmakers throughout the industry.

Proposals should be 2-5 pages long. Brevity is appreciated, though not at the expense of a clear and thorough explanation of the proposed project and its value to sugarmakers. Proposals should include:

- A description of how the funds will be spent.
- A description of the final product, and how it will be made available to sugarmakers in all parts of the maple producing region (NAMSC resources, including the Maple Syrup Digest, our websites, and our annual meeting are available to help support distribution).
- A budget for the project, including any funds from sources other than the grant.
- A timeline for the project.
- A brief letter of commitment from any presenters (extension agents, specialists, etc.) who will be engaged in the project. Applicants are encouraged to partner with experts and educational institutions as appropriate.

Criteria used to evaluate proposals will include:

- Demonstrated need among producers.
- Commitment to representing the most current industry standards.
- Applicability to a broad range of producers beyond the applicant's state or province.
- Ability to distribute the materials in accessible formats.
- Capacity of applicant to deliver project as proposed.
- Additional considerations are given to projects that collaborate and/or partner with experts, educational institutions, and multiple member associations.

Lower priority will be given to requests for capital expenses, such as cameras or computers. Funding can not be provided for projects that promote a single brand of equipment, or those that support a single producer or single state or province's products over others.

Proposals are accepted on a rolling

bases and are to be submitted electronically to The NAMSC education committee will review proposals and select finalists to be presented to the full NAMSC board for a final decision. These are one-year grants.

Only applications from NAMSC member associations will be considered. Partnerships between multiple member associations are welcome. Associations may only receive one grant through this program every three calendar years. Questions while preparing proposals are welcome, at mapledigest@gmail.com.

NAMSC Semi Annual Meeting And International Maple Hall Of Fame Induction

On May 16, 2025 the NAMSC held their Semi-Annual Meeting at The International Maple Museum in Croghan, New York. The meeting was held in person and via Zoom. The meeting was called to order by President Brian Bainbourgh. Roll call was read by Secretary Joe Polak. A season report was given by all delegates and attendees of the meeting, January meeting minutes were approved. Brian Bainbourgh gave his presidents report stating committees are more active. Research committee has asked for feedback from members. Letter of Intent has been sent to known research institutions. Contact Brin Bainborough or Kathy Hopkins if you have knowledge of institution that should receive letter that did not. Working to enhance the communication with IMSI. President attended IMSI's AGM. NAMSC is working to assist Michigan with conference plans. A financial report was giving by Joe Polak, NAMSC Treasurer.

Theresa Baroun, NAMSC Executive Director reported. 3635 copies of last issue of the March Maple Syrup Digest were mailed .Invoices that are paid by credit card, NAMSC will now add 4% for banking fees. Theresa continues holding monthly meetings with Kaylie Stuckey, Executive Director of IMSI. The NAMSC is working on updating the delegates tab on website and updating Mapleresearch.org. It was discussed there is a need for improving education on the rules regarding the use of isopropyl alcohol.

The Alliance Partners committee is in the process of contacting the current partners as well as contacting potential partners. Oregon Maple Syrup Producers Association has made application to join NAMSC. This will be voted on in October.

Jason Lilley reported on the Grading School. The Grading School exists with NAMSC support. The two-day school will be held with the conference. Other grading schools will be one day and held via zoom. This is a high-quality education program and gives the industry better quality syrup.

Michigan NAMSC conference has finalized the cost of event. $475.00 if register before September 1. Companion tours are planned. Education sessions are not finalized. Delegates will meet Wednesday October 22. Wednesday boat tours will be available afternoon and evening.

Missy Leab reported that Education committee has received one proposal from Ohio. Future Generations University is doing a monthly webinar with maple as a theme. NAMSC is looking into partening with FGU.

Maria Derosa presented a research update a Test strips for buddy Sap. Carlton University has produced test strips for buddy sap. More information will be available at conference in October. If interested in doing the tests contact; maria.derosa@carlton.ca.

Ray Bonnenberg gave an update on the Hall of Fame Inductees. Upcoming NAMSC Conferences will be held in Michigan, Ontario, Quebec, Pennsylvania, Indiana. If your association would like to be a future host contact Theresa at mapledigest@gmail.com. The meeting was adjourned.

Following the semiannual meeting, The Maple Hall of Fame scheduled a social night. Past inductees were sent an invitation but this is for all interested parties.

On Saturday, May 17, the day began with a great pancake breakfast served by the Maple Hall of Fame staff and volunteers. Following the breakfast, Mr. Ray Bonenberg presented each ind ductee with a lapel pin and plaque to commemorate their inclusion into the Hall of Fame. Tim Wilmot, Vermont and David Hamilton were inducted in to the International Maple Hall of Fame. Tim Perkins shared a biography of Tim Wilmot and Joe Polak of Dave Hamilton.

After the induction the Warren Wells Family Display was Unveiled followed by a luncheon. Attendees could tour the museum & displays and browse the gift shop and craft fair.

Ray Bonenburg and Dave Hamilton

Ray Bonenburg and Tim Wilmot

Ray Bonenburg and Bruce Gillian

Ray Bonenburg and Gary Graham

Ray Bonenburg and Tim Perkins

Top: Mark Isselhardt, Gary Graham, Tim Wilmot, Tim Perkins
Bottom: Warren Wells Family, Genevieve, and Don Moser

INNOV'ACER Event: A Hub Of Innovation And Knowledge Sharing

Luc Lugace, Ph. D
Centre ACER

The Centre ACER and the International Maple Syrup Institute (IMSI) were proud to host the INNOV'ACER event, a majorathering for the maple industry that took place from June 4 to 6, 2025, in Orford, Quebec.

This significant event focused on innovation, offering a rich and diverse program that captured the interest of attendees. It provided a unique opportunity to discover innovative research projects conducted by Centre ACER and its partners, and to attend inspiring presentations by renowned researchers from Quebec and the United States.

Centre ACER held its annual general meeting on the morning of Wednesday, June 4, while IMSI held its own on the afternoon of Thursday, June 5. IMSI also facilitated open discussions on high-priority topics for the industry.

INNOV'ACER proved to be much more than a meeting—it was a space for idea exchange, networking, and collaboration, all aimed at advancing the maple industry and exploring new perspectives.

Event Highlights:
The event featured a series of conferences designed to provide attendees with valuable knowledge and practical insights. The sessions were organized as follows:

Session #1 – June 4: Centre ACER et al. included presentations on projects conducted by Centre ACER or in collaboration with other research institutions.

Session #2 – June 5: focused on climate change and insect invasions, with university experts presenting on various aspects of these challenges.

Session #3 – June 6: organized by IMSI, addressed topics such as carbon footprint and sugarbush management for climate resilience.
Keynote Speakers:
The event welcomed distinguished speakers from various universities and research centers active in maple research, including:

- Centre ACER, Quebec, Canada
- Université du Québec à Chicoutimi (UQAC), Quebec, Canada
- Laval University, Quebec, Canada
- Concordia University, Quebec, Canada
- Sherbrooke University, Quebec, Canada
- Cornell University, New York, USA
- University of Vermont, Vermont, USA
- Université du Québec à Montréal (UQAM), Quebec, Canada
- University of Michigan, Michigan, USA
- University of Maine, Maine, USA

Conferences were offered in both French and English, with simultaneous translation.https://www.centreacer.qc.ca/Uploads/%C3%89v%C3%A8nements/I

Inscription___Innov_ACER.pdf

Networking Opportunities:
In addition to the conferences, INNOV'ACER offered numerous networking opportunities, allowing participants to connect with peers, exchange ideas, and build new partnerships.

This event was sponsored by:
CDL Sugaring Equipment
LAPIERRE Naturally Innovative
Financement agricole Canada (FAC)
Quebec Maple Syrup Producers
Maple from Canada
La Terre de Chez-nous
Créneau Acéricole
Government of Canada
Government of Quebec

Innov'ACER 2025: A Resounding Success for the Maple Sector
By Kaylie Stuckey- Executive Director, International Maple Syrup Institute

The maple industry came together in full force this June for Innov'ACER 2025, held June 4–6 in Orford, Quebec. Co-hosted by the International Maple Syrup Institute (IMSI) and Centre

ACER, the event brought together producers, researchers, industry leaders, and policy makers from across North America for three days of dialogue, discovery, and strategic planning for the future of the maple sector.

The conference opened with Centre ACER's Annual General Meeting on Wednesday morning, followed by a robust program of technical sessions exploring everything from climate resilience in maple production to cutting-edge developments in syrup grading. Presentations by researchers and industry experts sparked thoughtful discussion and new ideas- reinforcing the value of collaboration across provincial, state, and national lines.

The IMSI Annual General Meeting and Board of Directors meeting, were held Thursday afternoon and marked an important transition in leadership. Geneviève Clermont was officially welcomed as the new President of the IMSI. Geneviève brings deep expertise, vision, and a strong commitment

to the sector. Peter Christopher is now 1 st Vice President and Philippe Breton was welcomed onto the executive team as 2 nd Vice president. IMSI extends its heartfelt thanks to Martin Désilets, outgoing President, for his thoughtful leadership and dedicated service over thepast term. His contributions have strengthened the IMSI and positioned it well for the future.

Beyond the formal sessions, Innov'ACER 2025 provided vital networking opportunities.Whether over shared meals, hallway conversations, or shared meals, hallway conversations, or evening gatherings, participants mademeaningful connections and strengthened the relationships that keep our sector thriving.

Special thanks are owed to our partners at Centre ACER for their outstanding work in organizingt he event, and to the presenters and attendees who made it a success. As we look ahead, IMSI remains committed to fostering collaboration, supporting innovation, and representing the shared interests of the maple syrup industry across borders

Letter from the Editor

Theresa Baroun

Hello Maple Enthusiasts,

I hope everyone had a great maple season and the clean up is done. At our sugarhouse in De Pere, WI the 2025 maple season was a normal season. We started at tapping Feb 23, cooking on March 3, and finished around April 9. We cooked for 20 days in a row. Went through 80 crates of wood. We added a second vacuum system that also increased our sap yield. We may need to look into an R.O. for next year. The 2025 season was one of our best seasons on record. It is a good feeling to be cleaned up as well and starting to prepare for next year.

In May, I traveled to New York for the NAMSC semiannual meeting at the International Maple Museum in Croghan, New York and had the great honor of attending the Maple Hall of Fame induction Ceremony. Congratulations again to Dave Hamilton and Tim Wilmot for being this year's inductees. A huge thank you to the great staff and volun teers at the Maple

Museum, all the past attendees, and the Maple Hall of fame committee for all their hard work in making the 2025 induction a memorable experience.

As many of you are aware a huge concern for many producers, state and international, was what are the effects of tariffs on producers from syrup sales to equipment and beyond. I had quite a few interviews on how this will affect the industry. Yes, it would affect the industry. The big concern by many producers was and still is the unknown.

Research continues to be done on the use of defoamers by our industry and the potential of trace defoamer residue in finished product reaching consumers in the final retail package, climate change, invasive species, and buddy strips. These are just a few of the many items being research right now. If there is ever something a person feels needs research on or major research feel free to reach out to the many researcher or myself. The NAMSC Research Proposals Letters of Intent have recently been submitted for the June 15 deadline. The NAMSC $5000 Grant is open for applications as well.

The NAMSC along with the IMSI each submitted a formal comment urging the FDA to exempt pure maple syrup and maple sugar from any front-of-package "added sugar" or "high in sugar" icon. These are single-ingredient, traditional products that do not contain added sugars, and their sugar content is already fully disclosed on the Nutrition Facts label. The NAMSC and IMSI continue to work together on issues af fecting the maple industry. Please feel to reach out with any concerns.

As we continue to make changes to the Maple Digest Feel free to reach out with articles, pictures, events and stories about your season and events. This edition of Digest is filled with NASS stats, crop report, HOF. We will continue to add recipes. Please feel free to send in recipes. We continue to work as a Maple Digest committee work together to enhance the Digest. Thank you to again all the researchers, who continue to send research articles about their current research and all advertisers who help make the Maple Digest possible.

I hope to see everyone in Michigan in October. They Michigan Maple Syrup Association has spent many hours planning the event. They have a great conference planned filled with tours, presents, maple judging contests, vendor tradeshow etc. Be sure to mark your calendars Oct. 22-25, 2025. Go to www.michiganmaple.org and register today.

Enjoy your summer,
Theresa Baroun

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!

Mainline: $5,000 or more

CDL
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Lateral Line: $2,500-$4,999
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Farm Credit East
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New Hampshire Maple Producers Association
Ontario Maple Syrup Producers Association
Sugar Bush Supplies
Technologie Inovaweld

Bucket: up to $999

Matt Fisher
Paul and Pattii Gilbertson
Haigh's Maple Syrup
Indiana Maple Syrup Association
Maple Hollow
Massachusetts Maple Producers Association
Mohawk Valley Trading Co.
OESCO
Vermont Maple Sugar Makers Association
Wisconsin Maple Syrup

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.

MAPLE RESEARCH.ORG

NORTH AMERICAN MAPLE SYRUP COUNCIL

Visit mapleresearch.org, a curated collection of research papers, articles, videos, and tools, representing the most current and scientifically accurate information for maple production, to help all producers make the best products possible using the most current and most sustainable practices.

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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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