Maple Syrup Digest

Vol. 54, No. 4 December 2015

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The Newsletter of the North American Maple Syrup Council

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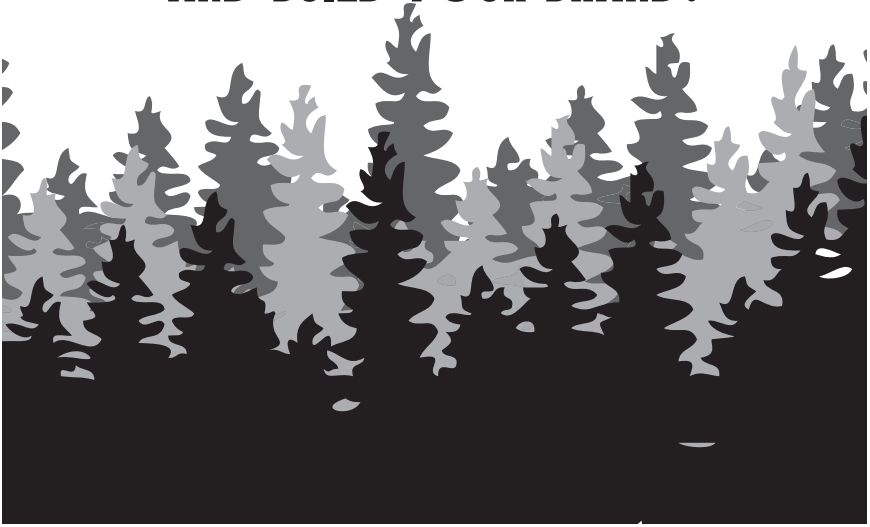

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Greetings from your President

The 56th annual meeting of the North American Maple Syrup Council is now a matter of record. The Somerset County (PA) Maple Producers Association truly set a very high bar of conference excellence for those Associations planning for future meetings. I have been actively involved with both the Council and IMSI for over three decades and seldom have I seen a program executed as flawlessly as the one in Seven Springs. Matt Emerick and his colleague maple producers are to be commended for a task well completed.

There is danger in offering kudos, lest one omit someone deserving recognition, but, I need to commend Dave Hamilton for his dedication and service as Council President and Vice President over the last four years. The Council's Executive Director, Secretary/Treasurer, *Maple Syrup Digest* Editor, and the Webmaster all spend far more hours than their compensation provides. This largely volunteer organization represents thousands of maple producers spread across nearly two dozen American States and Canadian Provinces laboring to supply the world with a multimillion dollar commodity, oversees a Research Fund, provides the *Maple Syrup Digest*, maintains an electronic archive, and is embarking on an expanding web presence. All this to assist and better enable a growing cadre of producers ranging from newcomers tapping a few hundred trees to those professionals running sugarbushes with a hundred thousand or more taps.

During the Pennsylvania meetings I was struck by the magnitude of change in this very old agricultural enterprise. The Somerset County Producers provided a beautiful display of sugaring artifacts (some nearly two centuries old) as part of their program while in a room next door and in the demonstration venue above, we heard research reports on 3/16" tubing, microbial contamination of fluid syrup, viewed the very latest in ultrahigh brix concentration of sap, and evaluated innovative research looking at induction heating of sap. In the "grand scheme" we aren't a huge commodity and as such don't usually command much attention in the major grant funding arena. Yet, this Council has invested nearly one million dollars over the last three decades via an organizational Research Fund that returns every dime earned through the "penny per container" Alliance Partner program in support of peer reviewed research. Clearly more needs to be done and there is room for both basic research as well as highly specialized inquiry.

On behalf of the Council officers, Directors, and Executive Director Michael Girard we look forward to addressing the challenges brought by a geographically diverse constituency engaged in producing one of the world's sweetest crops. We are pleased to welcome the West Virginia Maple Producers Association as the newest member of the Council.

President: continued on page 7

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President: continued from page 5

In closing, please remember that this is your Council and if you have questions or suggestions for change, please do not hesitate to contact one of us listed on the second page of this publication.

My best wishes as you prepare for the upcoming season.

Kind regards,
Eric Randall, NAMSC President

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Message from the Past President

I wish to express my sincere appreciation to all of the people who assisted me during my presidency the last two years. Thanks to all of the Delegates and Alternates for dedicating their time to NAMSC, thanks to Mike Girard, Joe Polak and Eric Randall for their advice and counsel, and thanks to Cecile Brassard Pichette for setting such a good example for me to follow. I am also indebted, as is the North American Maple Syrup Council, to Winton Pitcoff and Karl Zander for their fine work with the *Maple Digest* and the website.

The reigns of NAMSC have been turned over to two very capable people in Eric Randall and David Briggs. These two will provide great leadership for the Council. Thanks to all of you for your support and I hope to see you in Vermont next fall.

Dave Hamilton

In this issue...

Cover photo: Sperry's Sugar House in Middlefield, Ohio (Parkman Township). *Credit: Frank Merriman.*

The *Maple Syrup Digest* Goes Digital!

More than 200 back issues of the *Maple Syrup Digest* are now available to the public online. This collection is a rich archive of technical references, historical pieces, research reports, and fond memories for sugarmakers who have been reading the *Digest* for many years.

www.maplesyrupdigest.org

An index of past articles back to the first issue in 1962 is available on the site to help users find particular articles, or visitors can jump right to the issue they're looking for by date. Individual articles or entire issues can be printed from the site as well.

The site will be updated regularly, though new issues will only be posted a year after the publication date. While the site is not currently viewable on mobile devices, upgrades are in the works that will allow for that.

Back Issues of the *Digest* are Available!

Print copies of back issues of the *Maple Syrup Digest* are available for collectors, libraries, and anyone else interested. Copies of nearly all back issues remain, and orders can be for individual issues, or a set from any range of dates. I can even put a (nearly) complete set together for you. The cost will be based just on postage, so will depend upon the number of issues you order. Email editor@maplesyrupdigest.org and indicate which issues you're looking for.

Research: Tools

Comparison of Digital Refractometers for Use by Maple Producers

Morgan W. Southgate and Timothy D. Perkins
University of Vermont, Proctor Maple Research Center

For the contemporary sugar-maker, a refractometer can be an indispensable tool for measuring the sugar concentration of sap, concentrate, and syrup. Refractometers directly measure the index of refraction – the degree to which light is bent while passing through the sample. The index of refraction is linked to the dissolved sugar concentration (density) of the solution. Measurements of sap concentration can enable the identification of particularly sweet (or non-sweet) trees, verify the sugar concentration from reverse osmosis machines and test for sugar loss from membranes, and measurements of syrup provide a quick method of determining when syrup density is acceptable.

The Brix scale is commonly used in the maple industry to represent the concentration of sugar by mass in a solution of sugar and water. Since approximately 98% of the solids dissolved in maple syrup are sugars (North American Maple Syrup Producers Manual 2006) the Brix scale can be considered interchangeable with the percentage of sugar in syrup for all but the most precise analyses. The Brix scale is measured in degrees, where one ^{0} Brix is equal to one percent sugar by mass, so that a solution of 1 ^{0}Brix has a concentration of 1 g pure sugar per 100 g solution.

Many kinds of refractometer are available for purchase, including both digital and optical varieties. Optical refractometers have a prism onto which a few drops of the sample is placed and then distributed evenly with a top cover. The measurement in ^{0}Brix is obtained by looking through the eyepiece and finding the shadow line on the Brix scale of the prism. Digital refractometers have a sample dish or well into which the sap, concentrate, or syrup is added, and at the press of a button the measurement is displayed numerically on a screen. Most digital refractometers can be used to measure the sugar concentration across the range from sap and syrup, while the majority of optical refractometers have a more limited scale, restricting use to either sap and low levels of concentrate for some, or very high levels of concentrate and syrup for others.

The purpose of the present experiment was to test the precision of a variety of digital refractometers available to maple producers. Additionally, the effect of temperature on refractometer accuracy and precision was investigated, in order to assess the reliability of the automatic temperature compensation feature now present in the majority of refractometers. Such technology is necessary because the density of solutions is affected by changing temperature, and therefore measurements of refractive index are also altered.

Methods

Multiple brands of both optical and digital refractometers were used to measure the sugar concentration of

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sap, different levels of concentrate, and syrup, in ⁰Brix.

- 5 Palm Abbe digital handheld refractometers: PA 202 (2), PA 202x, PA 203 (2)
- 4 Pocket-Pal digital handheld refractometers: Pocket-Pal (2), Pocket-Pal 3 (2)
- 1 Milwaukee MA871 digital refractometer
- Variety of optical refractometers

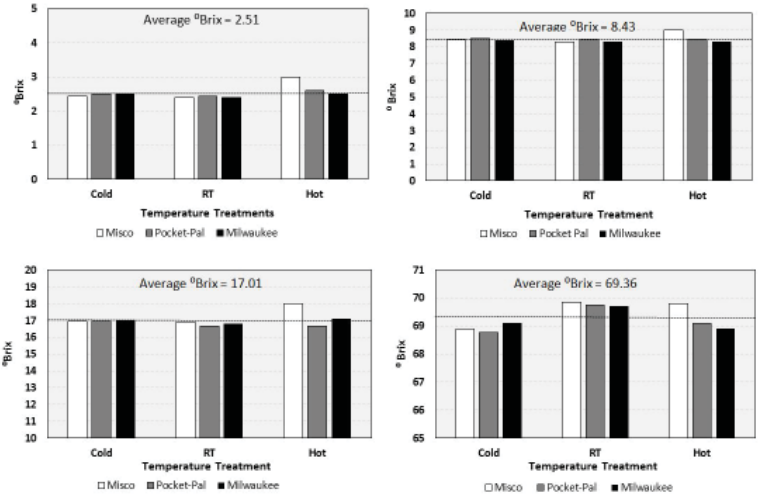
All refractometers were cleaned prior to use by lightly spraying distilled water onto the sample dish or prism surface and wiping dry with a clean absorbent cloth. Between each trial, all refractometers were cleaned by the same method. Distilled water was also used for calibration, in amounts specified by the instruction manual of each individual digital refractometer. The sample dish of digital refractometers is more difficult than the flat prism surface of optical refractometers to clean completely, and so all digital refractometers were tested with distilled water prior to each trial to ensure that no residual sugars were present in the sample dish. If a result over 0.0 ⁰ Brix was obtained, the sample dish was cleaned again and re-tested with distilled water. If distilled water measured under 0.0 ⁰ Brix, the refractometer was re-calibrated.

Sugar solutions representing various stages of concentrate and syrup produced at the PMRC were used as samples to measure refractometer precision. The sugar solutions were assembled from table sugar and sap frozen during the spring 2015 production season at PMRC and represented theoretical sugar concentrations of 2.5, 9, and 20 ⁰Brix. Preliminary measurements with the digital refractometers placed the average sugar content of the sap at 1.56 ⁰ Brix, equivalent to 0.156 g sugar/10 g solution, or 0.468 g sugar/30 g solution. To determine how much sugar to add to the sap in order to create each concentrate solution, the theoretical sugar concentration in ⁰Brix was converted into g sugar/30 g solution. The 0.48 g sugar/30 g solution already present in the sap was then subtracted from the total g of sugar present in the theoretical concentrate solution.

Digital and optical refractometers were used to measure the three concentrate solutions and the syrup at 0⁰C, room temperature (approximately 20⁰C), and 50 ⁰C. Ice baths and hot plates were used to prepare the cold and hot trial samples respectively prior to measurement. During the room temperature trials, readings were taken within a few seconds after transferring the solution to the sample dish or prism. For the hot and cold trials, readings were taken after one minute to allow the temperature of the solution and the refractometer to equilibrate before taking the reading. All solutions were

Sample	Cold Trial SE	RT Trial SE	Hot Trial SE
2.5 °Brix	0.037	0.036	0.086
8.4 °Brix	0.075	0.086	0.130
17.0 °Brix	0.056	0.067	0.219
69.3 °Brix	0.060	0.043	0.178

Table 1: Comparison of the standard error for each sample dataset by temperature trial for all digital refractometers.



Figures 1-4

kept fully covered and sealed as much as possible between extracting samples for measurement in order to prevent evaporation.

The results from the digital refractometers were analyzed primarily for precision and secondarily for accuracy, while the results from the optical refractometers were used to create a larger pool of data from which to establish a more accurate average sugar concentration for each concentrate solution and syrup.

To test the automatic temperature compensation capacity of the Misco refractometers during thermal equilibrium, additional interval trials were performed at hot and cold temperatures. For the equilibration processes of hot syrup cooling to room temperature and cold sap warming to room temperature, readings were taken with all Misco refractometers every 15 seconds for 2 minutes starting from the moment at which the solution was transferred to the sample dish.

Results and Discussion

Measurements of the concentrate solutions revealed the sugar concentration in ^{0}Brix to be slightly off from the theoretical sugar concentrations obtained by calculated addition of table sugar to the sap. Although the average experimental concentration of 2.51^0 Brix proved consistent with the theoretical sugar concentration, the solution mixed for an intended 9 ^{0}Brix had an average concentration of 8.43 ^{0}Brix. The solution with a theoretical sugar concentration of 20 ^{0}Brix had an average concentration of 17.01 ^{0}Brix. The discrepancy between the theoretical and experimental values likely occurred as a result of impurities present in the table sugar used to make the concentrate solutions. Such solid impurities would take up mass measured as pure sucrose, creating an experimental sugar concentration less than that of the theoretical. For the sample solutions representing higher levels of concentrate, more sucrose from table sugar than from sap contributed to the total sugar concentration. Therefore, the percent amount of associated impurities added to the solution along with the table sugar was likely higher for the sample solutions with higher sugar concentrations, providing a partial explanation for the increasing discrepancy between

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the theoretical and experimental sugar concentrations with increasing ^{0}Brix. This discrepancy is relevant to inquiries concerning refractometer accuracy, but is irrelevant to the analysis of refractometer precision, as the same solution was used for all refractometers.

Measurements of the same sample varied significantly based both on the temperature of the trial and on the refractometer. One interesting pattern concerning precision emerged based on the temperature of the solution. For all samples, a consistently larger standard error was observed for the hot trials than for the cold and room temperature trials (Table 1).

The relative imprecision observed for the hot trials is likely due in part to the measurements obtained from the Misco refractometers, as all are significantly over the average for each solution (Figures 1-4). These high results are produced in part by the automatic rounding which occurs when the setting on Misco refractometers is changed to measure samples with a temperature over 86 ^{0}F. Rather than reporting to a decimal place, the value in ^{0}Brix is rounded to a whole number due to the imprecision inherent within refractometer measurements of hot syrup (Misco Technical Bulletin). Additionally, this setting on the Misco refractometers was not properly set for the first round of hot trials, so it was necessary to redo these trials at the end of the experiment with the correct heat setting. Therefore, a probable source of error which could account for some of the above average readings taken by the Misco refractometers in the hot trials is the evaporation which inevitably occurred to some degree over the progression of the experiment.

The 15 second interval trial with the cold sap produced consistently high readings before stabilizing after approximately one minute. Starting with an average reading of 1.81 ^{0} Brix at 0 seconds, the readings quickly dropped within the first minute, so that after 60 seconds an average result of 1.62 ^{0}Brix was obtained. This stabilization of results indicates the point at which the solution and refractometer reached a state close to thermal equilibrium. This 0.18 ^{0}Brix decrease over a one minute period represents the error factor of the Misco automatic temperature compensation system.

Temperature	Sugar Concentration (^{0}Brix)	SE Misco	SE Other Digital
Cold	2.5	0.02	0.07
	8.4	0.04	0.15
	17.0	0.02	0.12
	69.3	0.03	0.12
RT	2.5	0.00	0.08
	8.4	0.03	0.18
	17.0	0.00	0.12
	69.3	0.02	0.08
Hot	2.5	0.00	0.11
	8.4	0.00	0.19
	17.0	0.00	0.15
	69.3	0.20	0.18

Table 2: The standard error for Misco refractometers versus the standard error of all other digital refractometers compared by temperature and sugar concentration.

The fifteen second interval trials with the hot syrup did not provide results useful towards understanding the temperature compensation capac-

ity of the Misco refractometers, as the automatic rounding of results to whole numbers eliminated any measurable progression towards a stable reading in the realm of tenths of a ^{0}Brix.

Misco refractometers exhibited a considerably higher degree of repeatability for each trial compared to the other digital refractometers tested as indicated by the smaller standard error of the Misco dataset for each trial (Table 2).

The exception to the trend of greater precision for the Misco refractometers is evident when the results for all three temperature trials are analyzed as one dataset. Due to the automatic rounding which occurs when the Misco refractometers are set for temperatures above 86 ^{0}F, the rounded results are highly precise within a single trial, as the tenths of a ^{0}Brix values in the reading are eliminated (Table 2). However, when considered in combination with the other trials at the same ^{0} Brix value, these rounded results are consistently higher, thereby decreasing the precision of the Misco refractometers when considered overall. As discussed above, these high results may also be due in part to experimental error involving evaporation.

Conclusions and Recommendations:

- Using refractometers requires understanding how measurements should be made and following the recommendations of the instrument manufacturer in regards to calibration, care, and use. Some refractometers will work for hot syrup, others do not and may be irreparably damaged by such use.
- All refractometers produced measurements that were generally accurate; however there was some variation in the actual readings. Comparison of readings made with different instruments may produce varying results and lead to incorrect conclusions, and thus such comparisons should be eliminated or interpreted only with great care.
- While refractometers can provide some indication of the density of syrup, the actual legal definition of syrup may not include refractometry as an accepted method. Maple producers should be aware of the required procedure in their given jurisdiction.
- For more accurate and precise results, let hot or cold samples reach thermal equilibrium before measurement. For samples at freezing temperatures this can take at least a minute, as evidenced by the slight decrease in ^{0}Brix value obtained for the fifteen second interval trial over the first minute. For samples at hot temperatures at least a minute is advisable before measurement as well, as indicated by the larger standard error for all hot trials despite the minute delay to allow the sample and refractometer to reach thermal equilibrium. Care should be taken to reduce evaporation during this wait period.
- Misco refractometers are very precise, but precision is reduced for hot samples. This automatic rounding should be understood as a feature which eliminates inaccuracy in the results. More precise and accurate results can be obtained by testing the sample again when it has reached full thermal equilibrium with the refractometer.

Industry: People

Tim Wilmot, University of Vermont Maple Extension Specialist, Retires

Timothy D. Perkins
University of Vermont, Proctor Maple Research Center

Timothy Wilmot, Maple Extension Specialist, retired on November 30th, 2015, after 29 years of service at the University of Vermont Proctor Maple Research Center.

Tim, who always loved being a student, entered the College of Wooster (Ohio) in 1967 as a Chemistry major and received his bachelor's degree in English six years later. In 1981 he returned to school, this time at the University of Vermont, and received a bachelor's degree in botany in 1984 and master's degree in botany from UVM in 1987. He joined the staff of the Proctor Maple Research Center as a research technician while finishing his master's degree and worked with Dr. Mel Tyree on a variety of projects, including a study of maple nutrition and fertilization, and research on the mechanism of sap flow in maple trees. For the latter study, one of his first projects was to build a 35′ scaffold around a maple tree and take a variety of measurements from dawn to dusk during the growing season, after which the tree was cut into 10,000 pieces so that the area of all the leaves and every stem supporting them could be measured. In February 1988, all the data was lost when fire consumed the entire Proctor Center lab, and this made for a somewhat interesting time in his life as his first child had been born a few days earlier.

During the maple syrup lead crisis, Tim conducted several studies examining the sources and lead contribution rates of various types of maple sap collection and processing equipment on finished syrup lead levels, resulting in the formulation of guidelines for use of lead-containing equipment in maple sugaring operations.

For many years Tim operated his webpage "Treemet" on the Proctor Center website, which showed sap pressure and flow in real time in several large trees at the Proctor Center during the sugaring season. This helped provide a source of entertainment for maple producers waiting for the sap to run and promoted a better understanding among both sugarmakers and the general public about how weather conditions affected these parameters.

In 2004, Tim was appointed as a maple specialist with University of Vermont Extension. He played a key role in the restructuring and transition of the former Vermont County Maple Schools into the highly successful Vermont Maple Conferences. His

research during this time focused upon increasing the understanding of sap flow mechanisms, the various environmental factors affecting flow, and applying this knowledge to improve sap yields from maple trees. He authored dozens of very interesting and popular articles, including an extensive series on maple research for Farming magazine, and began conducting an annual tapping survey to better understand the changes ongoing in the maple industry during this timeframe. He continued to participate in several ongoing studies by the scientists and staff of the UVM Proctor Maple Research Center involving emerging sap collecting equipment technologies and processes such as small spouts, vacuum, and tapping guidelines.

Most recently his research and outreach has focused on using 3/16" tubing to develop "natural" vacuum, a method Tim developed and championed. This approach has allowed many small producers to gain the benefits of vacuum production without the need for expensive equipment. Promising research is ongoing on using gravity vacuum as an adjunct to mechanically-produced vacuum in larger operations.

Tim has been a frequent speaker at conferences throughout the maple-producing region and has published widely in industry journals, numerous UVM published brochures, and scientific journals.

Although retiring from UVM, Tim will continue conducting work on sap collection with 3/16" tubing as well as other maple industry related questions as a researcher with Dominion & Grimm Co.

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Research: Health

Advances in Understanding the Potential Health Benefits of Maple Syrup: The Path Forward

Dr. Navindra P. Seeram, The University of Rhode Island

Studies to evaluate the potential health benefits of maple syrup are scarce. To date, there are a handful of published in vivo studies (in animal models) and several in vitro studies (in cell and laboratory based assays) that support the positive biological effects of maple syrup. However, there are no published human studies to validate these (preliminary) findings. This is unfortunate considering that over the past two decades, various other food commodity groups (e.g., oats and other whole grains, nuts, berries, fruits, several vegetables, olive oil, fish oil, many spices, dairy products, dark chocolate, and certain beverages including green tea, coffee, red wine, etc.) have invested considerable resources to fund scientific research to elucidate and substantiate the human health benefits of their products. Obviously, this has given a competitive marketing advantage to these foods since modern-day consumers want so called 'functional foods' or foods which impart health benefits that go beyond basic nutrition.

Over the past six years, my laboratory, and others, have been conducting research focused on identifying bioactive plant compounds (known as phytochemicals or phytonutrients) and evaluating the biological effects of maple syrup, maple water (i.e. maple sap), and maple plant parts and their derived extracts. These studies were funded, in large part, by the Federation of Maple Syrup Producers of Quebec (FPAQ) with the support of government institutions in Canada (AAFC-Agriculture and Agri-Food Canada) and in Quebec (MAPAQ - Ministry of Agriculture, Fisheries and Food of Quebec). In fact, the vast majority of the currently available published animal and laboratory-based studies on maple have been supported by FPAQ through these agencies.

These works have led to several peer-reviewed publications and presentations at international scientific conferences which have in turn garnered considerable attention from the public and scientific community (Figure 1). Although maple syrup is a newcomer to this target area, these research and public relation efforts have catapulted the natural sweetener into the functional foods category. However, unlike the other aforementioned plant foods, maple syrup faces additional challenges given the negative connotations associated with added sugars and excessive sugar consumption. Therefore, rigorous study designs, and careful and responsible dissemination of research findings will be necessary to position and keep maple syrup in the functional foods category so it can carve its own niche among other sweeteners and healthy plant foods.

Maple syrup is a unique natural sweetener. It contains over 100 different substances including mono-and disaccharides (primarily as sucrose), complex sugars (i.e. oligosaccharides),

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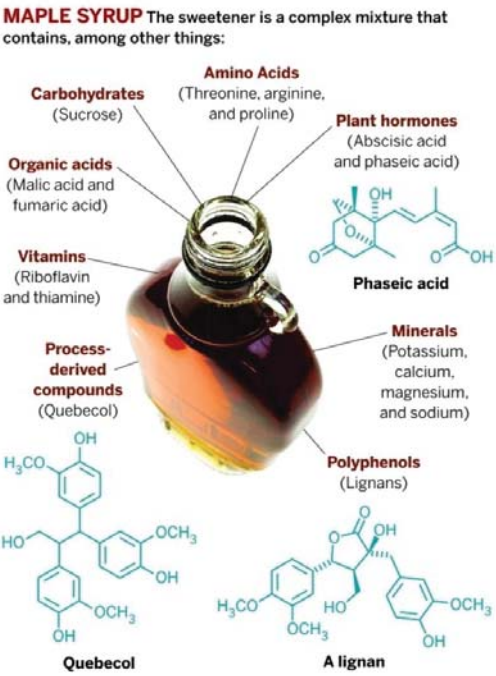
minerals, amino acids, organic acids, phytohormones, vitamins, and phytochemicals. It the phytochemicals that have been the research focus of my laboratory, and toward this end, we have isolated and identified a wide diversity of phytochemicals in maple syrup. Interestingly, maple syrup contains a diverse cocktail of different chemical sub-classes of plant compounds (known as polyphenols or phenolics) which are also found in several other healthy plant foods including flax, tea, berries, and red wine. Obviously these molecules are all found in one 'sweet' package and it is remarkable that many compounds which naturally occur in maple sap survive the concentration process to persist in maple syrup and co-exist along with others which are formed during processing.

Maple syrup contains more than 63 bioactive phenolic compounds counted to date, several of which are new molecules including the process-derived compound named Quebecol (see Figure 1). Apart from these compounds, it should also be emphasized that maple syrup also contains several other health beneficial constituents including vitamins, minerals, amino acids, organic acids and phytohormones. Using in vitro (cell and laboratory-based) assays, my group has demonstrated that maple syrup extracts have anti-diabetic and anti-inflammatory effects in vitro but this work is yet to be substantiated by in vivo studies (in animals and humans). However, as mentioned before, thus far, there are a handful (five) published animal studies on maple syrup: one from the research group of Dr. Andre Marette (Laval University, Quebec, Canada) and two from the research group of Dr. Keiko Abe (University of Tokyo, Tokyo, Japan) all which have been supported by FPAQ. The other two animal studies were published by a group from Kinki University in Osaka, Japan. All of these animal studies support a potential role for maple syrup in glucose regulation and liver protection.

Given this momentum, there is urgent need to continue on this trajectory of maple syrup health benefits research. This calls for a 'visionary think-tank' group to establish strategies to collaboratively combine resources to fund maple syrup health benefits based research. This is especially critical given the high costs of research studies and a rapid decline in funding available

from federal, state and provincial agencies in the United States and Canada, the only two commercial producing maple syrup countries in the world.

In summary, the "triple whammy" of unique chemical composition of macronutrients, micronutrients, and phytochemicals in maple syrup (Figure 1), in combination with their promising biological activities, supports its functional food applications. However, further in vivo studies are warranted to advance current scientific knowledge of the potential health benefits of maple syrup.



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Maple Syrup and the New U.S. Food Safety Rules

Winton Pitcoff

The final rules for the Food Safety Modernization Act (FSMA) have been issued, after several years of drafts and revisions, and concern about what the new regulations would mean for maple producers. Based on a read of the rules, and a discussion with Jenny Scott, Senior Advisor at the Office of Food Safety of the Food and Drug Administration's Center for Food Safety and Applied Nutrition, for most sugarmakers the impact will be minimal.

Briefly, sugarmakers who make nothing but pure maple products are likely to be exempt from most of the rules due to the size of their operations or because they only conduct low-risk activities on specified foods. Those who make certain value-added products, or who make other foods on their farm, may be subject to the rules. All sugarmakers still must register with the FDA and follow standards spelled out in the federal Good Food Manufacturing Practices (GMPs), as has been the law for many years.

Making maple syrup and other pure maple products is considered manufacturing or processing, which triggers the FDA requirement to register the business, so all sugaring operations are classified as farm mixed-type facilities, and are subject to the Preventive Controls for Human Food rule. The rule spells out requirements for establishing and implementing a food safety plan that includes an analysis of hazards and risk-based preventative controls – essentially highlighting all of the points within a production process where food safety could be compromised, and documenting and implementing steps that will be taken to eliminate those potential problems. Plans for monitoring and verification are key components of the plan, including extensive recordkeeping requirements. The plans don't need to be filed or approved, but do need to be in writing and followed, and will be reviewed during inspections. In addition, at least one employee must undergo training or be qualified through job experience to oversee critical safety functions of the operation.

However, small and very small on-farm businesses that conduct only low risk activities on foods specified in the rule are exempt from having to complete such a plan. Small businesses are those with fewer than 500 full-time equivalent employees, including all affiliates and subsidiaries to the business, and very small businesses are those with a three-year average of less than $1 million in sales of human food, including the value of human food held without sale. Making maple syrup, candy, cream and sugar are considered low-risk activity/food combinations, and so are exempt from the plan requirements if these are the only products manufactured on the farm.

But sugarmakers who are above these thresholds or who create value-added products that are not considered low-risk, whether as part of their maple business (dressings or barbeque sauce, for instance) or as another part of their farm operation (cheese or meat pro-

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cessing, for instance) must create a food safety plan that includes all manufacturing activities of the farm, including maple. The safety plan for the maple portion of the farm can be simple and straightforward, though, says Scott. Since making maple products is classified as a low-risk activity under FSMA, the plan can stress this fact, and can point out that any hazards are already controlled inherently through the production process.

For those operations that need to create a plan, the FDA will provide substantial guidance, says Scott. The Agency is developing a small entity compliance guide. There are many resources available online, at www.fda.gov/fsma, and sugarmakers can also fill out a web form at that site to submit questions. Extension specialists in many states can answer questions and provide guidance as well.

Many items that raised concerns in earlier drafts of the FMSA rules were dropped or modified in the final version, thanks to feedback from farmers and others. The definition of farms as being contiguous properties is no longer in the regulation, for example, and farms are not restricted from aggregating agricultural products from other farms.

The full rulemaking process is not yet complete. A final rule on amending the definition of retail food establishments is still pending, but Scott says that this most likely won't have an impact on sugarmakers who sell products through farmstores, farmstands, CSAs, or farmers markets.

Even if a sugaring operation is exempt from the requirement to develop a plan, all operations are required to register with the FDA and comply with the federal Good Food Manufacturing Practices (GMPs), as they have been for many years. While these regulations aren't new, many sugarmakers have looked more closely at these rules recently, as the FSMA rulemaking has been in process.

Anyone who manufactures food for sale must register with the FDA under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. This regulation has been in effect since December 12, 2003. Registration is done through an online form at http://goo.gl/nXYxP, and must subsequently be renewed between October 1 and December 31 of every even numbered year. Registration means that sugarhouses are subject to inspection. The law requires that these inspections happen no less than once every five years, and in most cases the FDA contracts with state agencies to carry out these inspections.

The requirements for recordkeeping that come with being a food manufacturer are also available online, at https://goo.gl/dMLuhj. For the purposes of traceability, sugarmakers must keep written records of all of their products, including date produced, quantity, and where items came from or went to. Records must be kept on hand for at least two years, and be made available if requested by an inspector.

The GMPs (http://goo.gl/3QIfRZ) outline basic standards and practices for every element of food manufacture, from equipment specifications to cleaning practices to sanitation, and are generally regarded as the minimum requirements for producing safe food. Many states have developed their own

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guidelines, some of them called Best Management Practices (BMPs), which are comparable to or more stringent than the GMPs, and set the standards for compliance in those states.

With growing concerns about food safety, these regulations have been put in place to protect public health. While pure maple products and the processes of making them may not pose the same potential hazards as other foods, they need to be held to the same standards of production and handling as other foods so that the public will trust our industry's commitment to safety.

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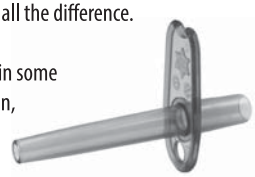

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Summaries of Research Presentations from 2015 NAMSC Annual Meeting

National Agricultural Statistics Service Report

U.S. Maple production increased by 6% from 2014-15, due to a 4% increase in taps and a 2% increase in yield, said Gary Keough, director of the New England Field Office of the USDA's National Agricultural Statistics Service (NASS). The 2015 season was three days shorter than 2014. Production in the U.S. has nearly tripled since 2000, and there has been a 73% increase in taps in that time.

Plans are underway to increase the number of states where NASS collects data on maple production. The plans have not been finalized, yet, but they are hoping to add Minnesota, Indiana, and West Virginia to the annual survey. None of the 10 states currently surveyed would be dropped from the process, so this would greatly improve NASS' ability to accurately reflect the size of the maple industry.

Keough reiterated his annual encouragement to sugarmakers to participate in the NASS survey. Data from the survey informs decisions about research, marketing, and financial assistance from the federal government, and if sugarmakers are undercounted, support will not be sufficient to sustain the industry. All sugarmakers with 100 taps or more should participate.

Keough reminded attendees that all survey responses to NASS are strictly confidential, and will not be shared with any other government agency. "You can tell the IRS what you want," he said. "Tell NASS what you did."

Supply and Demand: The State of Maple Syrup in 2015

Panelists Bruce Bascom of Bascom Maple Farms, Steve Anderson of Anderson's Maple Syrup, and Simon Trépanier from the Federation of Quebec Maple Syrup Producers all expressed optimism about the outlook for the maple industry. The last 10 years have been marked by stability in prices that hadn't existed before, said Bascom. The Federation has played a role in creating that stability, he said, since prices industry-wide tend to follow its lead.

The industry is still at the whim of the weather though, said Trépanier. The poor crop years of 2004-7 caused the Federation's reserves to go from 60 million pounds to zero. Poor production years could still cause an increase in prices, just as too much production could cause a decline.

Anderson recalled that three years ago he had felt it was not a good time to expand an existing or start a new sugaring operation, because he felt production was growing too fast. With new customers and higher sales, he said there's evidence that the industry is doing a better job of selling syrup, and as a result he thinks this is a good time to consider expanding.

"I think sales are growing faster than production," agreed Bascom. Trépanier said that Quebec is considering adding 500,000 new taps for the 2016 season to increase production to meet rising demand.

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Research: continued from page 31

Asked about maple water, the three panelists agreed that rising interest in bottled sap as a beverage could have an impact on the industry over time if it proves to be more than a passing fad. They said that having standards for production and quality of these products will be important over the next few years if it is to succeed.

Current Research at Centre Acer

Centre Acer is currently working on 15 maple projects, said Luc Lagacé, a research scientist and the team leader for the R&D Maple products and processes division at Acer. Projects include:

• Testing taphole diameter reduction impact on sap flow. Smaller tapholes reduce the amount of sap collected, but also reduce the amount of non-conductive wood created in the tree, and so have an impact on long-term productivity of each tree. These findings suggest that smaller tapholes might be a good alternative for sugarbushes with low growth rates or those affected by stresses. The use of high vacuum along with smaller tapholes reduces the decrease in yield to less than the decrease in size of the wound.

• Testing lateral line internal diameter reduction on sap flow. Smaller tubing is less expensive and somewhat easier to work with, though its use did result in a decline in sap production. Gravity systems and low sap flow sugarbushes using vacuum may find a benefit to switching to smaller tubing.

•Buddy syrup. The Centre will release a paper in 2016 on their work to characterize the origins of buddy flavored syrup. They are also working to develop methods to predict when syrup will taste buddy, and ways to treat sap to prevent this off flavor.

• Antifoaming agents. The Centre is evaluating and comparing the effectiveness of a range of defoamers and examining alternative methods, with an eye toward optimizing foaming control for producers.

• Flue pan cleaning. The Center is testing a range of commercial cleaning agents and then testing syrup produced after cleaning for residues.

• SpectrAcer. This automated device for finding taste defects and authenticity in syrup is still in development. It was used to analyze 15,000 samples of syrup in 2015.

• Extension work. Centre Acer trained 375 producers in the past year on tasting and grading maple syrup and in the proper use and calibration of maple instruments. They are developing their website to offer more resources, including an English version and a version for mobile devices.

Lagacé reported extensively on a project the Centre is conducting with assistance from a grant from the North American Maple Syrup Council Research Fund: "Evaluation of safety aspects regarding the use of Isopropyl alcohol as a sanitizer of the maple sap collection system." A report on this study is forthcoming, but preliminary findings suggest that the trace presences of chemicals found in sap and syrup after cleaning tubing systems with IPA were not significant enough to pose a problem. The use of IPA for cleaning is not legal in the United States.

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Current Research at University of Maine Extension

Researcher Kathy Hopkins reported on her several years of study of molds that have been found in bottled maple syrup. Her work has identified dozens of fungal contaminations in submitted samples, and found no correlations between the types of fungus found and the syrup's density or other characteristics. The molds can produce mycotoxins that can result in negative health impacts, but the quantities of the toxins found were so small that a significant investment in additional study would be needed to determine what, if any, health impacts they could have.

Since fungi cannot survive boiling, Hopkins said, evidence points to the introduction of these organisms during the bottling process. She emphasized the need for cleanliness when packaging syrup, and stressed that extra care is needed when putting syrup in small bottles, as it is difficult to keep syrup at the required temperatures when filling small glass bottles which have a higher ratio of surface area for the syrup to contact versus the full contents of the bottle. If those bottles are cold, she said, the temperature of the syrup drops immediately as it is being filled.

Hopkins is also undertaking a study, funded in part by the North American Maple Syrup Council Research Fund, to develop processing guidelines for maple sap as a seasonal beverage. The objective of this study is to determine if pasteurization will extend the shelf life of sap, and establish guidance for maple producers interested in producing seasonal sap beverages on a small scale. A full report on this work is forthcoming, but early findings suggested that heat treatment (pasteurization) and the acidification of the sap with lemon juice could give sap a one month shelf life if kept refrigerated below 40 degrees.

Current Research at University of Vermont Proctor Maple Research Center

Research Assistant Professor Dr. Abby van den Berg reported on a number of projects the Proctor Center is undertaking, including:

- Ongoing research into tubing cleaning, measuring which practices result in the greatest increase in yield and has the greatest net value. In comparing a range of cleaning methods, as well as spout and dropline replacement, results were comparable. When factoring in cost, however, spout and

dropline replacement offered the greatest return on investment. The Proctor Center has developed a downloadable spreadsheet tool for sugarmakers to input their costs and determine which cleaning methods are best for their operation.

• The Proctor Center is also researching birch syrup, and the economic value of making it for maple syrup producers. In some cases it can generate more revenue, and the Center has developed a downloadable tool to determine whether or not it makes sense for any particular operation (http://www.uvm.edu/~pmrc/?Page=birch.html). Researchers are also studying how birch trees differ from maples in terms of stem pressure and healing, and are working to develop sustainable tapping guidelines and best practices for birch syrup production.

• Research into sap collection from saplings, including how to integrate this type of collection with thinning practices in a more traditional sugarbush, is ongoing.

• As part of their work for the upcoming revisions to the North American Maple Syrup Producers Manual, researchers are revisiting and evaluating tapping guidelines, taking into effect issues like wounding, the effects on growth of removing sap each year, and others.

• The Center is in the early stages of a long-term study to examine the effects of tapping and sap extraction on the health and growth of sugar maples.

Extension Maple Specialist Tim Wilmot described his ongoing work with natural vacuum using 3/16" tubing. His most recent experiments involved using a small diaphragm pump that doesn't require a releaser, and found that such a system can generate high vacuum and even yield more sap than a system using 5/16" tubing and a traditional pump.

Wilmot has also conducted research to evaluate taphole injury in red maple trees, a project funded by the North American Maple Syrup Council Research Fund. A full report will be published in the Maple Syrup Digest in coming months, but summary findings indicate that the staining volume for each taphole is less than in sugar maples, and that tapping guidelines for red maples should be similar to those for sugar maples.

Research Association Mark Isslhardt reported on the Proctor Center's study entitled "Is tapping below the lateral line an effective tool to increase the size of the tapping band?" Funding for this project came from the North American Maple Syrup Council Research Fund. The expected concerns about sap quality and yield appeared to be unfounded in the experiments done during the 2015 season, and researchers intend to continue this project through the 2016 season. Final findings will be published in the *Maple Syrup Digest*.

Current Research at Cornell Maple Program

Stephen Childs, New York State Maple Specialist reported on a number of maple related research and extension projects. The most extensive project is being conducted in cooperation with the Proctor Maple Center in Vermont and involves testing a variety of cleaning and replacement options for maple spouts and droplines. These tests have shown significant increases in sap yield when spouts and drops are cleaned with

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proper contact times with the various sanitizers. The second area of tubing research is with the new 3/16″ tubing: yields increase with the increase in elevation drop in these systems and vacuum is created without the aid of a vacuum pump or releaser. Just where these systems are best suited needs further study. Other research includes the use of low cost, limited area fencing to exclude deer with the hope that areas of sugarbush regeneration can be accomplished in over-browsed forests. Research on various spouts, lines and vacuum for birch production have been conducted for two years at the Arnot research forest and will continue in 2016. Research on improving the quality and labor efficiency of making maple value-added products is a continuing priority of the Cornell Maple Program.

In addition to research, the Cornell Maple Program is involved in several extension projects. The largest is the development of K-6th grade curriculum to improve maple education through NY Ag in the Classroom. This project creates age appropriate worksheets, videos, smartboard programs and whole class activities for each elementary grade. The Cornell Maple Program has also developed a series of recipe brochures for point of sale education of consumers on the variety of ways to use maple syrup and maple sugar. Third, the Program has developed training videos to instruct small and back yard maple producers in making and managing reverse osmosis machines for more energy and time efficient maple production.

Is there Another Invasive Pest in your Sugarbush?

Bruce L. Parker, Margaret Skinner and Donald Tobi, University of Vermont Entomology Research Laboratory
Josef Görres, University of Vermont Plant & Soil Science Department

Years ago my Dad told me that earthworms were good not just for fishing but for the soil too. I believed everything he told me and I still do…that is most things. Earthworms are exotic species coming from Europe and Asia – everything seems to come from there these days. If it isn't an insect pest, it's something like chicken flu. These worms are disrupting the natural mix of plant species in our forests and becoming a serious threat to the biodiversity in our sugar maple forests. NO, they don't kill the trees we are tapping, but they will change the structure of the forest floor and its chemistry. What does this mean? Suddenly, and I mean suddenly, you may notice bald spots in your stands and little or no regeneration of sugar maples. These worms are aggressive and like other species reproduce rapidly allowing their populations to expand. The most destructive ones we call snake worms (Amynthas sp.), because of their wiggling behavior. In 2010 we found a sugar maple stand in Shelburne, Vermont with areas having no understory plants at all. When we investigated further we found significant populations of snake worms devouring the organic matter (leaf litter and other plant debris), causing soil conditions that discouraged growth of understory native plant species. Little is known about their distribution or even the total impact they have on our trees. They are spreading though in Vermont and other northern states. With funding from NAMSC we are looking at their distribution in maple stands throughout the region relative to forest management practices, and assessing their impact on understory diversity, maple regeneration and various soil characteristics.

How are we doing it? We have identified numerous sugar maple stands with active maple sugaring operations in USDA plant coldhardiness zones 3, 4 and 5 in New York, New Hampshire and Vermont. Some of these sites were established for a prior research project (funded in part by NAMSC and the Chittenden County Sugarmakers Association, VT) studying the relationship between the occurrence of insects and diseases and sugarbush tree composition. At each location, eight sub-plots were used. Earthworm damage was determined first using the Invasive Earthworm Rapid Assessment Tool (IERAT) and then earthworm abundance by hand-sorting and counting earthworm middens (mounds of debris created by Lumbricus terrestris, the nightcrawlers). Eleven additional sugarbushes in central to southern Vermont were surveyed for worm diversity and density and vegetation data were taken to increase the possibility of finding damaging levels of invasive worms. Worms were then collected, preserved, and keyed to species. The abundance of worms by species, and their density and biomass on an area basis will now be determined.

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Results to date. Nineteen sites were visited and plots established for invasive worm assessment. Of these, earthworms were detected in all but one site. Seven of the sites had the invasive earthworms called nightcrawlers. We found snake worms in two of the sites. In stands infested with either nightcrawlers or snake worms, we found an average of 3.99 and 0.63 sugar and red maple seedlings per plot, respectively, compared to 5.92 maple seedlings per plot in stands infested with neither of these worm species. The total number of understory plant species and percent ground cover in these sites followed a similar trend (Table 1). These data support the hypothesis that there is a definite impact of snake worms on the understory of maple stands. Using our statistical sampling tool (IERAT), it was revealed that the maximum damage class occurred when stands were either invaded by snake worms or nightcrawlers (where 1 = no disturbance and 5 = maximum disturbance, Table 1). In total, six different species of earthworms were found during our research in 2015. Elevation did not seem to be a reliable indicator of earthworm presence. Additional statistical analyses will be done this winter.

In summary, the presence of either snake worms or nightcrawlers clearly reduces the diversity of understory plant species and increases the amount of bare ground. This can lead to an increased potential for erosion and to changes in soil chemistry and texture. Finding populations of snake worms has proven difficult in northern and central Vermont and northern New York. High populations of nightcrawlers were more common in the zone 4

sites and are also known to negatively impact forest areas. Of 19 sites investigated during July and August 2015 two were found to have high populations of snake worms while seven sites had high populations of nightcrawlers. We found that high populations of both species can cause significant changes in understory plant species diversity and percent cover (area occupied by plants).

Table 1. Mean number of plant species and percent cover per square meter, and IERAT rating with and without *Amynthas* or *L. terrestris* worms

	Sites with no *L. terrestris* or *Amynthas* worms (n=14 sites, 56 plots)	Sites with *L. terrestris* worms (n=7 sites, 28 plots)	Sites with *Amynthas* worms (n=2 sites, 8 plots)
Mean # plant species/M2	4.70	3.20	1.63
% cover/M2	41.60	22.20	10.75
IERAT rating	1.84	4.75	4.8

What's next? Thirty additional sites will be located in regions closer to known snake worm populations and surveyed for worm abundance and species diversity. Study sites will be located by contacting state sugarmakera from nearby states known to have locally abundant snake worm populations such as in New York, Massachusetts, Connecticut, etc. to help find sugarmakers in their areas who either have noticed a lack of regeneration in their sugarwoods. Once located, four random 50 cm2 plots will be established at each of the 30 sites. Midden counts will be done at each plot and IERAT used to determine the impacts of invasive earthworms. At each of these subplots total worm species diversity will be determined using the hand-digging method. Work is underway to develop a sugarrmaker survey and a worm ID guide for distribution to NAMSC in the future to assist sugarmakers with evaluating the occurrence of invasive worms in their sugarbushes.

This project is supported by NAMSC, Chittenden County Sugarmakers Association, and the University of Vermont College of Agriculture and Life Sciences.

Minutes of the 2015 NAMSC Annual Meeting

October 19-22, 2015, Seven Springs, Pennsylvania

The 56th annual meeting of the North American Maple Syrup Council (NAMSC) was hosted by the Somerset County Maple Producers. The theme for the convention was "PA Maple - Pour it on."

The conference was held in conjunction with the 41st annual meeting of the International Maple Syrup Institute (IMSI). Meetings began on Monday October 19 with the NAMSC Informal Board meeting which included the officers, delegates, alternate delegates and committee members of the Council.

The IMSI Board of Directors meeting and maple research extension meetings were also held on Monday.

David C. Hamilton, president of NAMSC, opened the conference. J. Mark Harran, IMSI president, and Russell Redding, Pennsylvania Secretary of Agriculture welcomed everyone to PA.

David Hamilton opened the NAMSC general session and the first order of business was to introduce the West Virginia Maple Syrup Producers Association as a new member of the Council. Motion to accept made by R. Fideldy, second, J. Adamski, approved.

Secretary's Report:

Joe Polak, secretary, read the roll call of states and provinces. The delegates introduced their respective alternates.

Delegates (D) and Alternates (A) included:

- Maple Syrup Producers Association of **Connecticut**; J. Mark Harran (D), Ron Wenzel (A)
- **Indiana** Maple Syrup Association; Keith Ruble (D), David Hamilton (A)
- **Maine** Maple Producers Association; Lyle Merrifield (D)
- **Massachusetts** Maple Producers Association, Inc; Winton Pitcoff (D), Melissa Leab (A)
- **Michigan** Maple Syrup Association; Debbi Thomas (D), Larry Haigh (A)
- **Minnesota** Maple Producers Association, Inc; Ralph Fideldy (D), Stu Peterson (A)
- **New Brunswick** Maple Syrup Association, Inc; David Briggs (D)
- **New Hampshire** Maple Producers Association; Bill Eva (D)
- **New York** State Maple Producers Association; Dr. Eric Randall (D)
- Maple Producers Association of **Nova Scotia**; Avard Bentley (D)
- **Ohio** Maple Producers Association; Dan Brown (D), Dave Hively (A)
- **Pennsylvania** Maple Syrup producers Council; Larry Hamilton (D)
- Maple Syrup Producers Cooperative of **Quebec**; (Cooperative de Producteurs de Sirop D'erable du Quebec) Cecile Brassard Pichette (D), Michel Labbé (A)
- **Rhode Island** Maple Syrup Producers Association; Thomas Buck (D), Robert Burdick (A)
- **Vermont** Maple Sugar Makers Association; Matthew Gordon (D), Pam Green (A)

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- **West Virginia** Maple Syrup Producers Association; Tom Darnall (D), Mark Bowers (A)
- **Wisconsin** Maple Syrup Producers Association, Inc; James Adamski (D), Allan Herrmann (A)

Secretary reported all member states and provinces were present and represented.

The minutes of the 55th Annual Meeting held at Moncton, NB were presented as written by J. Polak. M/S, E. Randall, B. Eva, approved.

Financial Report:

Report of the General Fund FYE August 31, 2015 was presented by J. Polak, treasurer.

- Funds in checking account: $20,269.33.
- Cash receipts $62,859.77 and disbursements were $63,576.64, leaving net loss of $283.13.
- Income is based solely on dues from member states and provinces. $22,548.00 was billed last year, an increase of $9,890.00.
- Maple Syrup Digest receipts $50,741.29 and disbursements were $23,187.35 with a net gain of $27,553.94.
- Total balance of investments (CD's) $98,384.56.
- Research Fund balance in savings account: $69,699.94. Receipts $35,964.27 and disbursements were $44,801.56.

M/S, A. Bentley, C. Pichette, motion accepted subject to Audit/Review committee report.

Maple Digest **Report:** W. Pitcoff re-

ported the *Maple Syrup Digest* is doing well financially. This is due to a savings at the printer and additional advertisers. Request reports from states and provinces to be sent for publication. Photos are also needed.

Research Committee Report: W. Pitcoff stated the money to fund research projects comes from voluntary contributions from individuals and the majority of the funding through the NAMSC Research Alliance Partners through the penny per container program.

Projects to be funded this year:

- Exotic, Invasive Earthworms: A Clear and Present Danger to Regeneration in Our Northeastern Sugarbushes, The University of Vermont, Plant and Soil Science. $14,199.00.
- Increasing Energy Efficiency in Maple Syrup Evaporators, AcerBev, LLC. $5,000.00.
- Development of Standards of Authenticity for Commercial Maple Water Products, Center Acer. $10,000.00.
- Assessment of the Flavor of Syrup from Ultra-high Reverse Osmosis Processing, University of Vermont Proctor Maple Research Center, $ 15,000.00.

Policy Committee: W. Pitcoff reported the U.S. Food Safety Modernization Act recognized maple syrup as a low risk food. With input from the NAMSC Policy Committee maple sugar and maple cream are now also considered low risk.

Education Report: E. Randall reported NAMSC is developing a means of educational outreach to syrup producers. This may be a library of videos, webinars, written materials or part time extension services. The FY 2016 Budget allocates $9,821.00 for educational modules. Research is the first priority of education and the NAMSC Research Fund. NAMSC is participating in the current effort to update the next edition of the Maple Syrup Producers Manual.

Maple Syrup Digest and the website are also educational programs that are managed by NAMSC. Past issues of the Maple Syrup Digest (1963-2014) are now available online and indexed at www.maplesyrupdigest.org.

Conference calls this past year have provided industry wide medium of communication and transfer of knowledge between Officers, Delegates, Alternate Delegates, and Committees.

Eric Randall recently attended a board of directors meeting of the Ontario Maple Syrup Association.

Asian Longhorned Beetle position paper was presented by R. Bonenberg. Outbreak in the past year near Toronto airport has been contained. An Implementation Plan is being developed. The plan will address prevention, detection and response. We need to continue to educate the public.

Communication Committee: E. Randall stated a fund has been created for the editor of *Maple Syrup Digest* to reimburse some authors for contributing articles to the Digest.

Website as reported by K. Zander is making communication easier. There is a central list of industry contacts. This online directory will update email addresses. Digitizing the past issues of the Maple Syrup Digest was a huge project. Next year continue to develop directory, list serv, archives and reconstruct the NAMSC website.

International Maple Month: M.

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NAMSC: continued from page 43

Girard and D. Chapeskie are developing the concept of March is Maple Syrup Month. The committee is working on the implementation plan which will include links to maple events and food/cooking/lifestyle magazines that endorse use of maple. The committee intends to announce its plans in early 2016. M/S E. Randall, W. Pitcoff to support March as International Maple Syrup Month.

New Maple Producers Manual progress was reported by Dr. Abby van den Berg. There will substantial revisions of several chapters that are outdated and a new chapter on safety. The new edition will be spiral bound. Plan to release October 2016.

Lead Issue: D. Chapeskie stated eliminating all lead from maple equipment is imperative. The IMSI is continuing to raise awareness with sugarmakers, manufacturers and syrup packers. Good Manufacturing Practices manual is being developed. Ontario has a cost sharing program for equipment replacement.

IMSI Marketing Strategy: The NAMSC received and reviewed the IMSI marketing strategy dated January 30, 2015, and appreciates the opportunity to comment. *We support efforts to develop a marketing strategy for the maple industry, and look forward to being kept informed about additional developments on this project and opportunities to provide input. When specific opportunities to collaborate are raised, we will consider those items and consider contributing as our time and money allow and the tasks fit our mission.* M/S T. Buck, D. Brown, motion approved.

Budget for Fiscal Year End August

30, 2016 was presented by Treasurer J. Polak. The budget reflects anticipated revenue of $78,047 for all programs, including the Research Fund and the *Digest*, and expenses of $77,540. M/S J. Adamski, R. Fideldy. Budget approved.

Maple Research Specialist committee as reported by Mark Isselhardt. Thirteen individuals attended. Todd Leuty, Ontario has developed a weather blog. Steve Childs, New York is working on maple curriculum for grades K-6. He will present program October 2016. Center Acer, Quebec has developed field guide covering all aspects of maple production. Study group is recommended to look at research funding mechanism.

Maine Maple Industry Task Force was reported on by Kathryn Hopkins. Maine made maple the state sweetener. Task Force has affected zoning law changes and hopes to establish a Maple Commission.

Nominating Committee report: E. Randall, president; D. Briggs, vice president; J. Polak, Sec/Treas. No nominations from the floor. M/S W. Pitcoff, K. Ruble, motion approved

Associate Members: John Kuehn, Rick Fogel, Aggie Soijka-Sperry, Peter Gregg, Jay Johnson, George Cook, Jacques Couture, Peter Haas, Kathryn Hopkins, Daniel Lalanne, Russell Kidd, Eric Prudhomme, Todd Luety, and Helen Thomas. M/S E. Randall, B. Eva, motion approved.

Life Members: Mary Fogel Douglas and Bill Eva. M/S K. Ruble, L. Merrifield, motion approved

Executive Director: Mike Girard. M/S W. Pitcoff, R. Wenzel, motion approved.

Committee Appointments:

Audit: David Briggs, chairman, Debbi Thomas, Jim Adamski and Cecile Pichette

Communications: Eric Randall, chairman, Lyle Merrifield, Winton Pitcoff, David Briggs, Karl Zander, Mike Girard, Bill Eva and Dave Hamilton

Convention Planning: Joe Polak, chairman, Ralph Fideldy, Matt Gordon, Mike Girard, Eric Randall, and Michel Labbe

Finance: Dave Hamilton, chairman, Eric Randall, Mike Girard, Joe Polak and Avard Bentley

International Maple Day: Mike Girard, Dave Chapeskie, co-chairmen, Karl Zander, Lyle Merrifield, Dan Brown, Eric Randall and Winton Pitcoff

Policy/Strategic Plan: Winton Pitcoff, chairman, Mike Girard, Eric Randall, David Briggs, Joe Polak, Matt Gordon and Dan Brown

Maple Hall of Fame: Richard Norman, chairman, Gary Gaudette, Avard Bentley, Norman Anderson, Luc Lussier, Dave Chapeskie, Steve Selby and Roy Hutchinson

Nominating: Eric Randall, chairman, Debbi Thomas, Keith Ruble

Research: Winton Pitcoff, chairman, Jacques Couture, Tom McCrumm, Henry Marckres, Joe Polak, Eric Randall, Ron Wenzel and Martin Plante

M/S, D. Briggs, J. Adamski, motion to accept application by Michigan Maple Syrup Association to host convention 2024.

Vermont 2016: M. Gordon welcomed everyone to Burlington VT, October 26-29, 2016 for the 57th Annual Convention.

Minutes edited for length only.

Yvon Poitras, Tim Wilmot Win NAMSC Special Recognition Awards, Dominion and Grimm wins Haas award

Yvon Poitras (*center, with NAMSC Executive Director Mike Girard (l) and NAMSC Vice President David Briggs (r)*) from Frederickton, New Brunswick was presented with a NAMSC Special Recognition Award at the recent annual meeting. Poitras has been very active in the maple community for many years. He served 10 years as General Manager of the New Brunswick Maple Producers Association; nine years Director, and five years as Executive Officer of the IMSI and several years as New Brunswick's Alternate Delegate to the North American Maple Syrup Council. Yvon is also New Brunswick Maple Producers representative on the Canadian Maple Round Table.

Also honored for his contributions to the maple industry was Tim Wilmot, who is retiring this year from his position as Maple Extension Specialist at the University of Vermont. Tim's many years of maple research and Extension efforts have benefited sugarmakers throughout the maple belt with higher sap yields and profitability and he has helped ensure the sustainability of tapping practices and the health of the maple resource while advancing the science of maple research. (*See page 16 for more about Tim.*)

Equipment manufacturer Dominion and Grimm won the Richard G. Haas Distinguished Service Award for a Leading Research Alliance Partner. Manager Benoit Pepin accepted the award on behalf of the company, which has been a Research Alliance Partner since the program's inception, contributing thousands of dollars to the NAMSC Research Fund, which in turn supports research to strengthen the industry.

2016 Maple Hall of Fame Inductees Announced

The Maple Hall of Fame Induction and Opening Ceremonies will be held at the American Maple Museum on Saturday, May 14, 2016.

Henry Marckres from Vermont and Yvon Poitras from Nova Scotia will be the 2016 Inductees.

North American Maple Syrup Council Research Fund

The NAMSC Research Fund funds research that supports and advances the maple industry. In recent years we have given tens of thousands of dollars to projects that have developed innovative practices and technologies, helped deepen our understanding of the science of sugarmaking, and promoted the products we all make.

You can make a difference!

Concerned about the future of the Maple Industry? Make a contribution to support the maple research we fund. One easy way is to pledge to send $.01 per container to the NAMSC Research Fund. Grant recipients are announced at NAMSC Convention each October.

Research Alliance Partners

Dominion and Grimm U.S.A.
Haigh's Maple Syrup & Supplies LLC
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LaPierre Equipment
Maple Hollow
MA Maple Producers Association
Technologie Inovaweld, Inc
Sugar Bush Supplies Co.
VT Maple Sugar Makers' Association
WI Maple Syrup Producers Association

Please thank them when you do business with them.

Research Fund Contribution Form

Name _____

Address _____

City/State/Zip/Country _____

Phone _____ Email _____

Amount of Contribution _____containers x $.01 = $_____

Suggested Contribution is $.01 per Container. Send to Treasurer Joe Polak at the address below.

For more information contact:

Winton Pitcoff, Chairman: PO Box 6, Plainfield, MA 01070
413-634-5728, editor@maplesyrupdigest.org
Joe Polak, Treasurer: W1887 Robinson Drive, Merrill, WI 54452
715-536-7251, fax 715-536-1295, joe@maplehollowssyrup.com

The NAMSC Research Fund is a non-profit, volunteer committee of the North American Maple Syrup Council, Inc.

2015 NAMSC Maple & Photo Contest Winners

Maple Syrup and Confections

Golden Syrup
1: Girard's Sugarhouse, Heath, MA
2: Goodell Family Farm, Manuta, OH
3: Paul's Sugar House, Williamsburg, MA

Amber Syrup
1: Green's Sugar House, Poultney, VT
2: Boyden Bros. Maple, Conway, MA
3: Milroy Farms, Salisbury, PA

Dark Syrup
1: Gingerich Bros, Chardon, OH
2: Hermann's Maple Syrup, Colby, WI
3: Maple Hollow, Merill, WI

Very Dark Syrup
1: Walnutdale Maple Farms, Boswell, PA
2: Hillegas Sugar Camp, Fairhope, PA
3: Couture's Maple Shop B&B, Westfield, VT

Maple Sugar
1: Family Roots Farm, Wellsburg, WV
2: Emerick's Pure Maple Products, Hyman, PA
3: Bonhomie Acres, Frederickstown, OH

Maple Candy
1: Green's Sugar House, Poultney, VT
2: Windsor Hill Sugar House, Windsor, MA
3: Couture's Maple Shop B&B, Westfield, VT

Maple Cream
1: Couture's Maple Shop B&B, Westfield, VT
2: Gingerich Bros, Chardon, OH
3: Paul's Sugar House, Williamsburg, MA

Best of Show
Amber Syrup, Green's Sugar House, Poultney, VT

Maple Photograhpy

Sugarbush Scenes
1: Frank Merriman, Chardin, OH
2: John L Wayne, Jr., Arborvale, WV
3: Rachel Taylor, Arbovale, WV

Maple People
1: Cecelia D Bray, Union, CT
2: Jason Blocher, Salisbury, PA
3: Rachel Taylor, Arbovale, WV

Creative Maple
1: Christine Sechler, Confluence, PA
2: Stu Peterson, Dent, MN
3: Brian Folsom, Chester, NH

Industry: IMSI

Highlights from the IMSI Annual Meeting
Seven Springs, Pennsylvania, October 2015

Supply, Demand and Pricing

Generally, it was reported that demand for maple syrup is strong and prices are stable. Ontario was the exception where it was reported sales have been soft in 2015. Supply of syrup was reported as sufficient to meet market demand. Markets for certified organic syrup continue to exceed supply. The buy local movement continues to benefit the maple syrup industry both in the United States and Canada. It was also reported that the food service sector was purchasing more syrup.

The Federation reported that there were 62 million pounds of syrup remaining in the Strategic Reserve and that bulk syrup prices for 2016 were currently being negotiated.

Maple equipment sales have been holding steady in 2015.

IMSI North American Market Strategy and Implementation Plan

For over a year, the IMSI has had a committee working on a Market Study to develop a more global approach to marketing maple syrup, especially in the U.S. The strategy is founded on a belief that cooperative and collaborative marketing can significantly enhance and add value to ongoing individual marketing and promotion programs of associations, packers, retailers and oth-

ers. The goal of the strategy is:

- To grow maple syrup consumption by 10% per year for the next 7 years, effectively doubling the maple market size from about 1% to 2% share of the total sweetener market, currently dominated by corn syrup (55%) and cane/beet sugar (44%).
- This will be accomplished by:

  1) emphasizing good forest management and production practices across the maple industry, and

  2) working across maple's political, geographical, size, and functional roles (producers, packers, etc.), boundaries which have historically constrained cooperation in the marketing arena.

The plan will include a central slogan and key messaging regarding pure maple products and the maple syrup industry as well as a focused action plan for the next several years. Once an action plan is developed, potential sources of financing will be explored. IMSI and NAMSC members will have an opportunity to review and input into the developing implementation. The approved plan must be complementary and supportive of marketing and promotion activities already underway. It must be emphasized that the investment in developing and subsequently implementing a collaborative market strategy for the maple industry is to help ensure that the balance between supply and demand of maple syrup remains relatively stable, and that market share is maintained and enhanced going forward.

Annual Awards (2015 and 2016)

Anderson Maple Syrup, Inc. of Wisconsin was the recipient of the 2015 Golden Maple Award for innovation in marketing pure maple products. Dave Chapeskie, the IMSI's Executive Director was the recipient of the 2015 Lynn Reynolds Memorial Leadership Award.

The IMSI is very pleased that Yvon Poitras from New Brunswick, the current Past President of the IMSI, received the NAMSC Award of Merit for his service in October and will be inducted into the Maple Hall of Fame in Croghan, New York in May of 2016. Yvon has been a terrific asset to the maple industry for his leadership and accomplishments both in his home province of New Brunswick and at the North American level for may years.

Maple Month Proposal

The North American Maple Syrup Council (NAMSC) and IMSI have endorsed the proposal at the October Maple industry meetings declaring March to be International Maple Month. This will be a very good opportunity to showcase maple and to get politicians more involved in supporting the maple industry, as well as further enhance consumer awareness regarding the uniqueness of pure maple products. The idea is to create a wave during the month of March which will cause a ripple effect throughout the year and further enhance the collective maple marketing efforts. The implementation of Maple Month is intended to be fully complementary to ongoing maple promotion activities in the different States and Provinces and will be complementary to the IMSI's Marketing Strategy. A copy of the Maple Month Proposal can be obtained from either Mike Girard or Dave Chapeskie. A Joint Committee of the NAMSC and IMSI is now working to finalize details of the implementation plan. Both organizations are contributing financially to the implementation plan.

Industry: Mislabeling

VT Association Seeks Signators on Letter to FDA

The Vermont Maple Sugar Makers' Association is circulating a letter for state producers' associations and others to sign on to, asking the U.S. Food and Drug Administration (FDA) to take action against food products with misleading labels that suggest that they contain pure maple syrup, but do not.

"These products declare "maple" or "maple flavor" on their packaging as a characterizing ingredient, even where maple syrup . . . is not actually present in the product, and they fail to follow requirements for characterizing ingredients under current regulations," reads the letter. "As maple syrup purveyors or producers, or parties otherwise invested in a healthy maple syrup marketplace, we have a particular interest in ensuring that products claiming to contain maple are properly labeled to prevent consumer confusion. Thus, we request that FDA take enforcement actions to stop these companies from marketing the misbranded products identified below." The letter lists ten specific products for the FDA to take immediate action on, but indicates that there are many others as well and "urges the FDA to take comprehensive action to protect consumers from deception regarding maple products."

Under the Food, Drug and Cosmetic Act, the FDA has legal authority to take action against misbranded items. In this

case, if a product name includes "maple," or its packaging emphasizes the presence of maple (e.g., through vignettes of maple syrup, leaves, and trees), but the product does not actually contain any maple syrup, it is unlawfully misbranded under this regulation. "There are many products currently on the market in violation of this regulation," says the letter. "This unchecked misbranding has an adverse impact on manufacturers of products containing real maple syrup, as it allows cheaper products not containing premium ingredients to compete with those actually containing maple syrup."

Sugarmaker associations interested in signing on to the letter should contact VMSMA Executive Director Matt Gordon at mgordon@vermontmaple.org or 802-498-7767 by December 15, 2015.

Welcome West Virginia!

The West Virginia Maple Syrup Producers Association is the newsest member of NAMSC. They were represented at the October meeting in Pennsylvania by Delegate Tom Darnall and Alternate Mark Bowers.

2016 New York Calendar of Upcoming Schools and Workshops

January 8-9: New York State Maple Conference, Verona NY, Contact: Keith Schiebel; kschiebel@vvsschools.org or go to cornellmaple.com

January 11: Maple Production for the Beginner, Seneca County, Contact: Derek Simmonds, Agriculture Economic Development Specialist, Cornell Cooperative Extension of Seneca County, 308 Main Street Shop Centre, Waterloo, NY 13165, 315-539-9251, www.senecacountycce.org

January 14: Maple Production for the Beginner, Ontario County, Contact: Russell Welser, Cornell Cooperative Extension Ontario County, 480 North Main Street, Canandaigua, NY 14424, Phone: 585-394-3977, Fax: 585-394-0377, e-mail rw43@comell.edu

January 16: Western NY Maple School, Contact: Deb Welch, Cornell Cooperative Extension of Wyoming County, 401 North Main Street, Warsaw NY 14569; 585-786-2251; djw275@cornell.edu

January 22: Lewis County Maple Production for the Beginner, Contact: Michele Ledoux, Cornell Cooperative Extension Lewis County, 5274 Outer Stowe Street, P.O. Box 72, Lowville, New York 13367; 315-376-5270; mel14@cornell.edu

January 23: Lewis County Maple School, Contact: Michele Ledoux, Cornell Cooperative Extension Lewis County, 5274 Outer Stowe Street, P.O. Box 72, Lowville, New York 13367; 315-376-5270; mel14@cornell.edu

January 26: Maple Production Class, Ontario County, Contact: Russell Welser, Cornell Cooperative Extension Ontario County, 480 North Main Street, Canandaigua, NY 14424, Phone: 585-394-3977, Fax: 585-394-0377, e-mail rw43@comell.edu

January 29: Maple School at the Miner Institute, Contact: Michael Farrell, Ph.D., The Henry II and Mildred A. Uihlein Director of The Uihlein Forest, 157 Bear Cub Lane, Lake Placid, NY 12946, mlf36@cornell.edu Office (518) 523 9337 Cell: (518) 637 7000

January 30: Maple Expo- St. Lawrence County, Contact: Cornell Cooperative Extension, 1894 State Highway 68, Canton, NY 13617-1477; 315-379-9192

February 6: Oswego County Maple School, Contact: JJ Schell, Cornell Cooperative Extension of Oswego County, 3288 Main St., Mexico, NY 13114-3499; 315-963-7286; jjs69@cornell.edu

February 27: Developments in Maple Production in New York State, 1 pm New York Farm Show

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The 2016 New York State Maple Tour

Save the date now for the 2016 New York State Maple Tour scheduled for July 17-19, 2016 in central New York State. The tour will be centered at the Ramada Hotel and Conference Center in Cortland NY. Cortland is located in the beautiful eastern Finger Lakes region of New York. This tour will feature maple operations of various sizes and specialties. Information will be available soon at the nysmaple.com and cornellmaple.com sites.

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FOR SALE: Reverse Osmosis Systems for maple sap. Save tons of time, energy and money. We build 3 systems. 150-200GPH ($3955.00) 300-350GPH ($4955.00) and 450-500GPH ($5955.00). Built to order in 3-5 days. FREE SHIPPING Call (614) 843-8491 Bill.

Local author wishes to interview multi-generational (preferably 5 or more) sugar-producing families in New York State for an upcoming book. Please contact Dan Ladue at dladue12901@yahoo.com

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