MAINE MAPLE PRODUCERS ASSOCIATION

# THE MAINE TAP

NEWS AND RESOURCES FOR SUGARMAKERS

Quarterly Newsletter

March 2024

## Inside this Issue:



## Producer Spotlight Bemis Family Farm

Member of MAINE MAPLE PRODUCERS ASSOC.

## President's Note

*Greetings Maple Producers,*

Well as I write this letter the sugaring season has already made a sporadic start, with some syrup made around the state by early January. It does appear now that most producers in their respective regions are in line for a (normal?) start to the season. As we move closer to Maine Maple Sunday, and for some, Maine Maple Sunday Weekend, I encourage all State licensed members to participate. It is awesome that we can have so many sugarhouses' participating, and that each sugarhouse, large or small can tailor the event to their size. It is a great opportunity for each sugarhouse to promote themselves and the maple products that they offer. Members also should keep in mind that, as they host a Maine Maple Sunday they are helping to promote and strengthen Maine's Maple Industry for the 41st year. (Always the 4th Sunday in March)

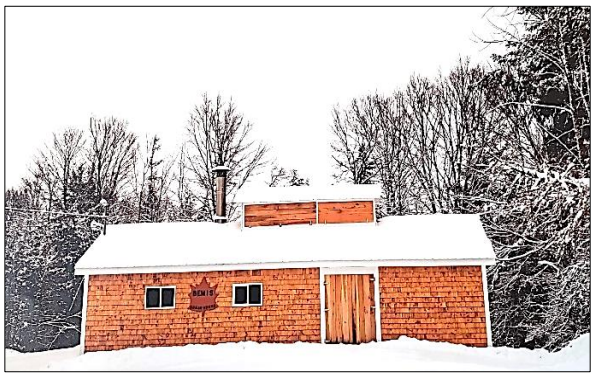
Our organization has truly been blessed with the success of Maine Maple Sunday, a success that has been sought after by other commodities in State to create their own day, and many maple producing States across the country. Thank you all who helped create this day some 41 years ago.

In closing I hope everyone has a safe and productive maple season, good luck.

*Lyle Merrifield*
President

# Producer Spotlight ~ Stephen Bemis, Bemis Family Farm, Corinna, Maine, Penobscot County

The Bemis Family Farm is owned and operated by Stephen Bemis, with help from family – sister, Clairissa, and father, Bill, and others. Stephen has been a maple producer for 12 years; six years at the current location where the sugar house was built in 2019. On the same land, back in the 1970s, Bill started sugaring for about a decade alongside his grandfather. During that time, they did over 1,000 buckets.



## The operation ~ collecting, boiling, and finishing

We currently have 1400 taps on land we lease from the family, which is behind the sugar house. Over the past few years, we added taps bringing it to the current number.

We collect sap with a pipeline system connected to vacuum. With our trees running down the hill away from the sugar house we bring sap back with a tractor and tank.

We boil on a Leader 3x12 wood fired evaporator with a blower and steamaway. Then we filter it and jug it into five-gallon containers. We bottle the syrup in mostly glass containers and use the stored syrup to make value-added products, such as maple fudge, maple sugar, jelly and candy, gift boxes and baskets, and more bottling, as needed.

## Marketing

Bill Bemis.

We have several ways to market our syrup. At the farm we have a farmstand and an online store. We do farmers markets in Hamden Waterville, and the United Farmers Market in Belfast. Over the last couple of years, we have added a few wholesale customers.

During Maine Maple Sunday Weekend we open the sugar house up, show the operation and how the maple sugaring process works. Our trees are nearby, which gives us an opportunity to show people pipelines and where it all starts. We also have syrup and maple products for sale.

## Lessons learned and future plans

Found, old spile from the 1970s.

One of many things learned over the years is to try to have everything organized so the operation runs as smoothly as possible during what can be chaos during maple season. We have a checklist for each year of what we need to get done, whether that's an upgrade or just normal chores like firewood for the evaporator, and we try to have all of these tasks completed before the start of the season. Sometimes it's simply making sure we have the right tools or equipment in place to get the job completed.

We've had a lot of market growth over the last few years. So, we are going to try to increase production by improving pipelines and adding more taps. As we can work it in, we are going to try to improve other areas so it's more efficient, like trying to have more space for storing and displaying products. We are amazed at how much syrup and products we've sold in recent years; at times it's been kinda crazy keeping up!

*Continued on page 4…*

1865 THE UNIVERSITY OF MAINE Cooperative Extension

EXTENSION PIPELINE

# Density: Tips for Achieving your Target Sugar Concentration Levels

Finishing your syrup between 66.0°brix and 68.9°brix is the legal requirement for selling syrup in Maine. Most bulk buyers require syrup to meet the Vermont and New Hampshire standards of 66.9°-68.9°brix. That said, most producers set a goal of hitting an exact target density somewhere in the middle of the range. Understanding the tools you're using to achieve that density is key to ensuring a legal density, and to meet target density goals. There are several ways that all of the tools designed for measuring density can lose accuracy or be read inaccurately. I'll discuss those common issues here.

**Selecting the appropriate tool for the job:**

Tools for measuring density include the refractometer, hydrometer, and thermometer. Both *digital and analog refractometers* work on the principle that light is bent as it passes through a solution. The more solids (sucrose) in your test solution, the more the light bends. There is a prism under the well for the syrup sample. That prism can break with extreme temperature swings, meaning that this tool should not be used with hot syrup. Additionally, the small amount of syrup that is used for measurements with refractometers means that a significant amount of evaporation can happen in short period of time with hot syrup, which could throw off your readings. Lastly, many refractometers are not designed for reading hot or even warm syrup. If you have an automatic temperature compensation (ATC) refractometer, you should have an option to tell the tool if you are reading syrup over or under a certain temperature. As an example, Misco refractometers have a temperature cutoff at $86^0$F. You'll notice that if you set the tool to measure syrup over $86^0$F you will only get an accuracy of full °brix (ex. 66, 67, 68°brix). Under $86^0$F that accuracy goes down to 0.1°brix (ex. 66.7, 66.8, 66.9°brix). For these reasons, it's recommended to keep the refractometer on hand when testing sample jars, prior to reheating for canning, etc., but to not use these for determining when syrup is done off of the evaporator.

A *thermometer* is the key tool for many backyard operations, and is how auto-draw-offs function. Syrup that is $7.5^0$F above the boiling point of water at your elevation on that day will be 67.0°brix. If your target is 66.0°brix, then you should be aiming for $7.1^0$F above the boiling point of water. The *key point here is that the target temperature changes day by day based on barometric pressure*. For this reason, thermometers and auto-draw-offs need to be calibrated each day by determining the boiling point of pure water, and using that as a base for adding your desired increase in boiling temperature to (typically $7.5^0$F). Simply assuming that water boils at $212^0$F and that $219.5^0$F is your target syrup temperature could give you wildly inaccurate actual final densities. As an example, a syrup that is $6.6^0$F above the boiling point of water would only be 64.9°brix, while syrup finished at $8.8^0$F above water would be 69.5°brix. It does not take much change in barometric pressure to lead to more than a $1.5^0$F change in boiling temp. If this is the case your syrup would be out of legal density range on the upper or lower end.

*Continued on page 4…*

## Producer Spotlight …*Continued from page 2*

### MMPA membership

We joined MMPA to support the organization; the information provided by MMPA is helpful. Having the connection with other maple operators in Maine is very helpful. If you have a question or problem involving your maple operation there are other maple producers you can reach out to who might have been in that situation at some point in their maple operation.
(Pictured left is owner, Stephen Bemis. Pictured on page 1 is Stephen's niece, Karleigh.)

## EXTENSION PIPELINE ...*Continued from page 3*

*Hydrometers* are the most common tool used in sugarhouses for determining syrup density off of the evaporator. These tools are an excellent method for measuring hot syrup density. They work on the principle of displacement and act like a glass balloon floating in the syrup. The thicker the syrup the higher the hydrometer will float. It will sink deeper in thinner syrup. Just as syrup will roll off your tongue and pancakes easier when hotter, the hydrometer will sink deeper into the syrup when the syrup is hot. It is important to keep in mind that hydrometers are very temperature dependent. While there is a red "hot line" on most hydrometers, you'll notice that the tick marks on the hydrometer read 59°brix where the hot test line is. That's because the markings are calibrated for a syrup that is $60^0$F. If you sampled a syrup that reads just at the hot test line when $209^0$F (right off the evaporator), and then tested when it cooled to $60^0$F, it should read at 66.9°brix. That said, if you pour syrup into your hydrometer cup, then walk to the other side of the sugarhouse to get the hydrometer, then test, that syrup likely cooled $15^0$F or more during that time. At that point the hot test line is not relevant, and a temperature compensation would need to be done (or you could just repour hot syrup). As part of the Maple Grading School, myself and Mark Isselhardt from UVM extension have reworked the hydrometer temperature compensation card from the North American Maple Syrup Producers Manual (3rd Edition) to simplify the temperature compensation card and to help producers determine if they are within the legal density range when using a hydrometer at temperatures other than $209^0$F and $60^0$F. **(See Maple Syrup Hydrometer Care and Use card on page 5.)**

**Common sources of error when testing for density include** 1) testing hot syrup on refractometers and using digital refractometers with low batteries, 2) not adjusting thermometer readings for changes in barometric pressure at your altitude, 3) not compensating for temperature when using hydrometers, and 4) using hydrometers that have not been tested for accuracy, or that have fallen out of accuracy. Sources of problems with hydrometers include buildup of scale, nitre, and sugar on the tool, cracked glass that allows moisture inside, and slipped or twisted paper.
Have backup hydrometers on hand, compare multiple tools against each other, and feel free to give me a call if you'd like to discuss or test any of your tools. Have a great season and feel free to reach out with questions or to request a sugarhouse visit.

Jason.lilley@maine.edu or 207-781-6099.

THE UNIVERSITY OF VERMONT EXTENSION

# Maple Syrup Hydrometer Care & Use

Hydrometers are thin glass, precisely weighted tubes with a printed graduations sealed inside. Hydrometers are the most commonly used instrument for measuring the density of pure maple syrup. All that is needed is a relatively inexpensive but accurate hydrometer, an accurate thermometer and a hydrometer cup. Maple syrup hydrometers rely on the principal of displacement: a floating hydrometer displaces a volume of syrup equal to the mass of the hydrometer. Given that the viscosity of pure maple syrup can differ greatly depending on if it is hot or cold, it is critical to measure the temperature of the syrup in which the hydrometer is floating.

Willits C.O and Hills, C.H. Maple Syrup Producers Manual 1976, USDA Agricultural Research Service. Agricultural Handbook No. 134

## Hydrometer Range

*°For syrup hydrometers calibrated in °Brix at 60° F*

| Temperature *(Degrees F)* | °Brix Range *(For syrup with legal minimum of 66.9 °Brix)* | |
|---|---|---|
| | Min | Max |
| 209° | 59.0 | 61.0 |
| 202° | 59.60 | 61.60 |
| 195° | 60.10 | 62.10 |
| 190° | 60.25 | 62.25 |
| 185° | 60.50 | 62.50 |
| 180° | 61.40 | 63.40 |
| 175° | 61.0 | 63.0 |
| 170° | 61.25 | 63.25 |
| 165° | 61.55 | 63.55 |
| 160° | 61.80 | 63.80 |
| 155° | 62.10 | 64.10 |
| 150° | 62.35 | 64.35 |
| 145° | 62.65 | 64.65 |
| 140° | 62.90 | 64.90 |
| 135° | 63.15 | 65.15 |
| 130° | 63.40 | 65.40 |
| 125° | 63.65 | 65.65 |
| 120° | 63.90 | 65.90 |
| 115° | 64.15 | 66.15 |
| 110° | 64.40 | 66.40 |
| 100° | 64.90 | 66.90 |
| 90° | 65.40 | 67.40 |
| 80° | 65.90 | 67.90 |
| 70° | 66.40 | 68.40 |
| 60° | 66.90 | 68.90 |

Concept for table by Deborah Fuller

*Occasionally the paper inside a hydrometer can shift. Place a recently tested hydrometer next to the diagram and mark the location of the "hot test" and "cold test" lines. The marks can be used as reference to see if the paper has shifted in the future.*


**Continued from Extension Pipeline, *Density: Tips for Achieving your Target Sugar Concentration Levels* on pages 3 and 4.**

# Density Reduction

| Volume of water added to 1 gallon of syrup to lower its density a desired amount | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Density reduction of syrup desired (°Brix) | | | | | | | |
| | 0.5° | 1° | 1.5° | 2° | 2.5° | 3° | 3.5° | 4° |
| | Fluid Onces (Oz.) of water to add per gallon of syrup to reduce density | | | | | | | |
| 0° (Water) | 1.26 | 2.52 | 3.8 | 5.08 | 6.38 | 7.68 | 8.99 | 10.32 |

Always make sure water used to dilute syrup is potable and everything is well mixed before taking another hydrometer reading.

Adapted from Table 8.3, North American Maple Syrup Producers Manual, Third Edition 2022 University of Vermont in cooperation with The North American Maple Syrup Council Perkins, T.D., Heiligmann, R.B., Koelling, M.R. and van den Berg, A.K. Editors

# Jones Rule

| | Original Jone sRule of 86 for 65.5 °Brix Syrup | New Jones Rule of 87.1 for 66.0 °Brix Syrup | New Jones Rule of 88.2 for 66.9 °Brix |
|---|---|---|---|
| °Brix | Sap (gal) | Sap (gal) | Sap (gal) |
| 2 | 43 | 43.23 | 43.78 |
| 4 | 21.5 | 21.46 | 21.73 |
| 8 | 10.75 | 10.57 | 10.71 |
| 10 | 8.6 | 8.39 | 8.5 |
| 20 | 4.3 | 4.04 | 4.09 |
| 40 | 2.15 | 1.86 | 1.89 |
| 60 | 1.43 | 1.13 | 1.15 |
| 65.5 | 1.31 | 1.01 | 1.03 |
| 66 | 1.3 | 1 | 1.02 |
| 66.9 | 1.29 | 0.98 | 1 |

*These estimates do not account for "shrinkage" caused by losses in transport and production of pure maple syrup.

Adapted from "The Jones Rule of 86 Revisited" Perkins, T.D. and Isselhardt, M.L. 2013

# Hydrometer Tips & Care

**Hydrometers are delicate, glass instruments that can provide years of use but are also easily damaged or rendered innacurate if not used properly.**

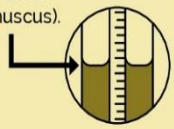
***It is crititcal*** to know the temperature of the syrup while using the hydrometer. Syrup cools rapidly. Make sure the thermometer being used is accurate.

Make sure to test hydrometers for accuracy and are ***retest periodically***.

***Keep Hydrometer clean!*** 0.5g of extra weight in the form of syrup, sugar crystals or accumulated niter can result in hydrometer readings 2 °Brix heavy (2 °Brix is the entire legal range of density for pure maple syrup).

***Gently lower the hydrometer*** into syrup. Pouring syrup over hydrometer can result in syrup clinging to the stem, thus causing innacurate readings.

Read the point on the hydrometer stem where the syrup level crosses and not the highest point the syrup reaches (minuscus).



Check out the UVM Extension Maple instructional video on density and hydrometers

# Maple Syrup Contest Winners and Awards

Above: Kathy Hopkins and Jason Lilley testing maple syrup contest entries. Jo-Ann Merrifield and Jason.

Golden Delicate
1. Hilltop Boilers

Amber Rich
1. Merrifield Farm
2. Jillson's Sugarhouse
3. Hilltop Boilers

Dark Robust
1. Pingree Maple Products
2. Moonlight Maple
3. Day Mountain Maple

Very Dark Strong
1. Hilltop Boilers
2. Kinney's Sugarhouse

Cream
1. Hilltop Boilers
2. Merrifield Farm
3. Thurston and Peters

Candy
1. Hilltop Boilers
2. 207 Tappers
3. Kinney's Sugarhouse

Best In Show
Merrifield Farm (with Amber Rich)

Top row: Richard and Roberta Morrill, Nash Valley Sugarhouse; Harry and Deb Hartford, Thurston and Peters; John Bryant, Hilltop Boilers. (See Awards descriptions on page 7.) Middle row: Maryanne Kinney, Kinney's Sugarhouse; Tom Pingree, Pingree Maple Products; Collin Neil, Day Mountain Maple; Annual meeting attendees; Bottom row: Roger Gervis, Jillson's Sugarhouse. Presenters were Scott Dunn, Alan Greene, and Tom Pingree. (Photos by Jo-Ann Merrifield, Lexi Merrifield, and Debbie Bryant.)

# Annual Awards (See photos on page 6.)

**Young Maine Maple Syrup Producer of The Year:** This award is given to an individual or group that is licensed with the State of Maine to sell maple syrup and is less than 30 years of age.
*Recipient: Thomas Bryant.*

**Alfred Bolduc Leadership Award***:* This award is given to an individual that has been active in the Maine Maple industry within the last 5 years and shown outstanding leadership in the industry.
*Recipient: Richard and Roberta Morrill.*

**Maple Syrup Producer of The Year**: This award is given to an individual or group that is licensed with the State of Maine to sell Maple Syrup.
*Recipient: Harry and Deb Hartford.*

## Annual Tree-Tapping at the Blaine House with Governor Mills




Top left photo: Past Pres. Scott Dunn, Sen. Henry Ingwersen, Ag Commissioner Amanda Beal, Gov. Mills, Assoc. Pres. Lyle Merrifield, Assoc. Treas. Valerie Greene, Assoc. VP Alan Greene, Assoc. Treas. Lexi Merrifield, and her sister Molly Bellefleur.

## Glazed Apple-Maple Blondies

Makes 2 doz.

**Ingredients:**

1 1/3 cups packed brown sugar
1/2 cup butter, melted and cooled
1/2 cup maple syrup
2 tsp. vanilla extract
2 large eggs, room temperature
2 cups all-purpose flour
3/4 tsp. salt
1/4 tsp. baking soda
3 cups chopped peeled apples (about 3 med.)

**Glaze:**

1/4 cup butter, cubed
1/2 cup maple syrup
1/4 cup packed brown sugar

**Directions:**

Preheat oven to 350°. Line a 13x9-in. baking pan with parchment, letting ends extend up sides.

In a large bowl, beat brown sugar, melted butter, syrup and vanilla until blended. Beat in eggs, one at a time, beating well after each addition. In another bowl, whisk flour, salt and baking soda; gradually beat into brown sugar mixture. Stir in apples (batter will be thick).

Transfer batter to prepared pan. Bake until top is golden brown and a toothpick inserted in center comes out with moist crumbs, 25-30 minutes.

Meanwhile, in a small saucepan, melt butter over medium-low heat; stir in syrup and brown sugar. Bring to a boil over medium heat; cook and stir until slightly thickened, 2-3 minutes. Remove from heat; cool slightly.

Pour glaze over warm blondies. Cool completely in pan on a wire rack. Cut into bars.

–From *Taste of Home*

c/o Lyle Merrifield
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