Maple Syrup Making for Beginners

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With help from
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Ohio Extension
North American Maple Production Region
Sugar Maple

*Acer saccharum*
The Many Faces of a Sugar Maple
Black Maple

*Acer nigrum*
Red Maple

*Acer rubrum*
Silver Maple

_Acer saccharinum_
Sap Flow

A Complex Biological Process
SAP FLOW

• Is possible due to differing barometric pressures inside and outside the tree. Lower pressure outside the tree, increases sap flow.

• Temp. below <32°F creates negative pressure, = suction brings water from the ground into the roots.

• As temp. goes above >32 °F a positive (~40 lbs/sq in) pressure is formed by gases & dissolved sugars, sap flows upward in the tree.

<32°F = negative pressure = suction
>32°F = Positive pressure pushes sap

Converted Starch to Sugar + Soil water in roots = sap
WHEN SHOULD I TAP?

- Days
- Nights

Temperature: 32°F
When Should I Tap?

• It Depends !!! 😊
• There is no set date anywhere
• Tap when the conditions are right
• Best advise
  – Talk to other producers
    • Early to Mid January (southern)
    • Early January to early February (northern)
  – Watch the weather
  – Don’t go by set date or Farmers Almanac
When Tapping

- Tap **HEALTHY** trees/tap healthy wood
- Use the **CORRECT NUMBER** of tap holes/tree
- **LOCATE** tap holes properly
- Use **PROPER** tapping **TECHNIQUE**
  - Sharp, Clean Bit
  - Round Hole, Proper Size
  - Up-sloped Tap hole (~10°)
  - Clean Hole, *Do Not Blow In It*
How Do I Tap?

Carefully!
Tapping is one of the most important steps of sugaring!
Installing Spouts & Splies

- Use proper spout/spile
- Use **CLEAN** spouts
- If metal, **NO CORROSION**
- Minimize handling
- Seat spouts carefully

**REMOVE TAPS AFTER SEASON**
How Should I Tap?

Locate the Maples
Drill Clean Round Hole
~ 2” Deep @ 10° up angle
Hang Bucket/Tubing

Oval Hole = Leakage + Microorganisms

Round Hole = Tight Seal + Longer Life
Tricks For Correct Tap Hole Depth
Clean Sharp Bit

Dull Bit

~ 10° Upslope
Tap Location – “The 4-6 Rule”

• Place taps 4” & 6” from last years tap hole
  – Can be any of the following:
  – 4” left up 6”
  – 4” left down 6”
  – 6” left up 4”
  – 6” left down 4”
  – Going right will work for you south paws too!
“The 4-6 Rule”

Stay out of stain and in white wood
Tapping Equipment

Drill Bit Sizes:

7/16” - 19/64” - 5/16”

Hand Brace

Cordless Drill

Gasoline Tapper
Critical To Drill Hole Properly

- Mistakes here will cost you
- Sharp, clean bit
- Round hole for proper seal
- Don’t blow in hole
- Don’t spray anything in hole
- Seat tap don’t pound it in
Bad Tap Holes

• If you hit brown wood stop and move hole
• If leaking can try reseating tap “carefully”
• Reaming hole has not proven beneficial
• Drilling new hole after first one dry's up causes more damage
7/16”

5/16”

“Spouts”
"Spiles" or "Spouts"
Current Tapping Guidelines

• 1 Tap - 12-18’ diameter
• 2 Taps - 18” & larger diameter
Collecting - Buckets

• Use only clean, **FOOD GRADE** containers, preferably those intended for maple
• If metal, **NO CORROSION & NO LEAD**
• **COVER** collecting containers
• **GATHER FREQUENTLY** - dump if not used
• Leave ice in containers early in season, throw away later
• **CLEAN** gathering buckets/tanks after Warm period
Collecting Sap With Tubing

• Saves a lot of time in the woods
• Not an install and walk away system
• Takes planning
• Works under gravity
• Vacuum will increase production
• Remember “STD”
  – *Straight – Tight – Downhill*
• Need to check for leaks daily
• *Allows you to do more with less labor*
How Much Sap Storage Do I Need?
It Depends !!!

- Number of trees
- Percent Sugar (average °Brix)
- How long the run is
- How big the evaporator is
- How hot the fire is
What is a Brix?

Brix is an expression equivalent to % solids, 98+% of which is sugar.
Rule of 86

or

“How Much Sap Do I Need To Make A Gallon Of Syrup”

\[
\frac{86}{\% \text{ sap sugar content}} = \text{gal. sap/gal. syrup}
\]

\[
\frac{86}{2\%} = 43 \text{ gal. sap/gal. syrup}
\]

Must Evaporate 42 Gallons Of Water Per Gallon Of Syrup
Sap @ 2% sugar concentration

43 gal sap = 1 gal syrup
Rule of Thumb

1 TAP ~ 10 GALLONS SAP ~ 1 QUART SYRUP
Sap Storage Needs

A factor of number of trees and how fast you can boil

- Best advise is plan for 2-3 gallons per tree or a good one to two day run, or more if holding sap

<table>
<thead>
<tr>
<th># Trees</th>
<th>Gallons of Sap Storage Needed</th>
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<tbody>
<tr>
<td>10</td>
<td>20-30</td>
</tr>
<tr>
<td>50</td>
<td>100-150</td>
</tr>
<tr>
<td>100</td>
<td>200-300</td>
</tr>
<tr>
<td>1,000</td>
<td>2,000-3,000</td>
</tr>
<tr>
<td>2,500</td>
<td>5,000-7,500</td>
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</table>
Sap Storage
10-15 taps
Sap Storage

75-100 taps
Sap Storage

• In **BUCKETS** if small enough

• If in tanks, start with **CLEAN TANK** after each run

• Tank should be **CLOSED OR COVERED**

• **FILTER SAP** before enters storage tank

• Keep sap **COOL**

• **PROCESS SAP AS SOON AS POSSIBLE**
How Do I Make Maple Syrup?
What You Need Besides Sap

- Desire
- Time
- Patients… and lots of it
- Sense of humor
- Evaporation unit
- Heat or BTU’s and lots of them
Processing Sap To Syrup

• Always start with **CLEAN EQUIPMENT**
• **PROCESS RUN** the **SAME DAY** if possible
• Be realistic about amount can process with equipment and time available
• Finish at **PROPER DENSITY**
  • \((66^\circ \text{ brix} = \text{bp} + 7.1^\circ \text{ F}, \ 67^\circ \text{ brix} = \text{BP} + 7.5^\circ \text{ f})\)
• **PROCESS AS QUICKLY** as possible
• **MINIMIZE DEFOAMER** / never animal base
• **FILTER THE SAP & SYRUP .... OFTEN**
Flat-Pan Batch Process
Approximate Time To Produce 1 Gallon Maple Syrup From 2% Sap

<table>
<thead>
<tr>
<th>Rate of Evaporation gal water/hr</th>
<th>hrs/gal Syrup</th>
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<tbody>
<tr>
<td>3/4</td>
<td>56</td>
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<tr>
<td>1</td>
<td>42</td>
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<tr>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>10.5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
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<td>8</td>
<td>5.2</td>
</tr>
<tr>
<td>10</td>
<td>4.2</td>
</tr>
<tr>
<td>12</td>
<td>3.5</td>
</tr>
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<td>14</td>
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</tr>
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<td>18</td>
<td>2.3</td>
</tr>
<tr>
<td>20</td>
<td>2.1</td>
</tr>
</tbody>
</table>
Evaporates $\frac{3}{4}$-2 gal/hr

Evaporates 3-8 gal/hr

Syrup 1 gal every 42 to 56 hrs

Syrup 1 gal every 5 to 15 hrs
Evaporates

25 gal/hr

2 x 6
Evaporates 150 gal/hr

3 x 12

15 gal of syrup every hour
How Much Time Do You Have?

- **Taps × gallons of sap/tap = gallons of sap**
  Gallons of sap ÷ time devoted to boiling (hours) = required evaporation capacity

- **500 gal ÷ 6 hrs = 84 gal/hr evaporation capacity**
  Need a 3’ × 10’ evaporator
  2’ × 6’ would take 9 to 10 hours +/- depending on energy level and rigorously feeding the fire box
  2’ × 2’ flat pan would take 10 to 28 hours +/-
How Sap Becomes Syrup

• As sap moves across the heat water is evaporated off condensing the sugars
Defoamer
Defoamer NO-NO’s

• Do Not Use
  – Butter, cream, milk
  – Eggs
  – Peanut butter
  – Bacon fat (any animal products)

• Chemical Defoamers
  – Keep in cool place during season
  – Keep in freezer out of season
  – Only good for couple years (go rancid)

Go Rancid & Allergy Issues
Sugarmaker Must Have Tools

Thermometers

Hydrometers

Barometer
How Do I Know When I’m Done Boiling

**Hydrometer**

1. Hydrometer **Clean & Dry**
2. Cup Length ~ Hydrometer Length, ~1½ As Wide As Hydrometer
3. **Fill Cup To Top**
   *(Float Foam Off If Hot Test)*
4. Lower Hydrometer Gently Into Syrup **Without Submerging**
5. If Hot Test, Check Temp. Immediately First Couple of Times To Insure Not Falling Below 210° F.
6. **Read As Soon As Stable**
• Hydrometer •
Crystallizing

Finished

Heavy
How Do I Filter My Syrup?

More is better!
You can filter many times through the process.
Methods of Filtering Sap

- Screens
- Poly or Flannel Cones
- Inline Water Filter
- Washable Sock
- Diatomaceous Earth Filters
Filters for Sap
Methods of Filtering Syrup

- Poly or Flannel Prefilter Cones
- Orlon or Wool Cones
- Flat Filters
- Diatomaceous Earth Filters
  - Canister
  - Plate and Frame
Cone and Flat Filters

EVB0008W

EVPAT008
SS Filter Tanks
7” Pressure Filter with Stand
7” with Hand Pump
How Do I Package My Syrup?

This is the final step where you can kill the flavor!
Commercial Bottling Units
Hobby Bottling Units

Syrup ONLY!
Storing Maple Syrup

- **TASTE** all batches
- **PACKAGE** AT 180-190°F
- Use new unused **CONTAINERS**
- Be sure **CONTAINERS ARE SEALED**
- Turn container on side after filled
- Store in refrigerator once opened
Never Reuse Containers
Marketing Your Maple Syrup

Joe Polak
Maple Hollow
Merrill, WI
Identify Your Abilities

- How much time can you commit to sales?
- Do you like people?
- Do you have sales skills?
- Do you need a license?
- Do you have proper insurance?
- Is your syrup properly packaged?
- Will you do follow-up?
Identify Your Market
A Roadside Stand at your Sugarhouse
Identify Your Market

- A Roadside Stand at Your Sugarhouse
- Supermarket
- Warehouse / Distributor
- Specialty Food Stores
- Mail Order
- Internet
What are You Selling?

- Commodity
- An Experience
- Specialty Product
  - Packaging
  - Other Maple Products
  - Gift Boxes
Experience

Pail on Tree
Experience

Sap Sak
Experience

Tubing
Specialty Product

- Package in a Maple Container
- Keep Consistent Flavor
- Label Properly
- Consistent Grade
Specialty Glass
Maple Syrup Labels
Grading Maple Syrup

COLOR STANDARDS FOR MAPLE SYRUP
ESTABLISHED BY UNITED STATES DEPARTMENT OF AGRICULTURE
Grading of Maple Syrup

- **Grade A Light Amber** – has mild flavor with light color. Used for making candy, crème and butter. Top of the line!

- **Grade A Medium Amber** – has pronounced maple flavor and a medium amber color. Good all-purpose flavor. It is generally used as a table-grade syrup.

- **Grade A Dark Amber** – has a deeper color and stronger flavor, sometimes called “caramel-like”. Can be used as table-grade syrup.

- **Grade B** – has a rich, dark color and a much stronger flavor. It is recommended for baking and mixing with other syrups. It is much less expensive than grade a syrups.

- **Grade C** – has the darkest color and strongest flavor. It is recommended for baking and blending. It is the least expensive.
Other Maple Products

- Organic Maple Syrup
- Maple Crème
- Maple Butter
- Maple Sugar Candy
- Maple Sugar Granules
- Maple BBQ Sauce
- Maple Mustard
A Quality Product
The Resource that everyone should have.
Info.maplehollow@frontier.com

Maple Hollow       Merrill, WI