

## BACKYARD MAPLE SYRUP MAKING Geoff Webb 2/4/2022

**QUICK HISTORY:** Maple sap has been extracted from sugar maples long before our ancestors came over the ocean. The art of making maple syrup was much learned from Native American Indians. In the early days of settlers, sugar was a rare commodity and maple syrup/sugar was produced as the “sucrose” of the era. As time went on, cane and beet sugars became more prevalent so a lot of the maple syrup needs went away. But today, it has been coming back as a novelty, for its rich, sweet taste that is hard to beat. Today, there is over 3 million gallons of syrup made in the U.S. at a value over 100 million dollars. Most of the syrup made is in the east coast (Main, Vermont.....others). The U.S. makes about one quarter of the North America quantity and Canada makes the rest.

**TAPPING TREES:** So what trees do you tap? It depends on what you have. Sugar maple is the best as it has the higher sugar content averaging around 2% sugar. But you can tap others: Red maple, Black maple, Silver maple, and others in the *Acer* genus, such as the boxelder. Some of the others, such as Silver maple and Boxelder, have 1% or less sugar content. Maple syrup is defined as having a sugar content between 66 and 68 percent (Brix). So it takes about 49 gallons of sap at 2% sugar content to make one gallon of syrup. That means you have to boil away 48 gallons of water. If you tap Silver maple at 1% sugar content, you may have to boil away 100 gallons of water to get a gallon of syrup. So if you can, tap the higher yield ones. If not tap the others, it's all interesting and fun that Mother Nature can provide this to us.

**To tap a tree,** 5/16” holes are pretty much the standard these days. The older hole size was 7/16”, with the old time spouts and galvanized buckets. The bigger hole does not give that much more sap and stresses the tree a little more to heal the wound made. 1/4 “ taps also work, but produce about 10% less sap. When tapping, use a new, good sharp wood bit. Hole depths should be between 1-1/2” to 2”. Ideal is 1-3/4”. Shallower will produce less sap and larger can get into the heartwood and the hole will dry up and the tree will heal up the hole quicker so you'll have a shorter season. Tap trees that are larger than 10” or so, 4 ft up from the ground, with a single tap. Leave the smaller trees alone, to grow. Trees larger than 20” can have 2 taps. More than 2 taps on bigger trees is not advised.

**Spouts (spiles)** have a variety of shapes and sizes for particular applications. The most simple is a straight spout that will either hold a bag, bucket or tubing fed into a bucket. Some are plastic. Some are stainless steel. Some are treated with antibacterial coatings. To get the longest run of sap from a tree, it is important to sanitize your spouts before using and between season (soak them in a mild calcium bleach solution for 30 minutes). Trees will detect bacteria and microbes and start to shut off sap to the area to heal the hole up. The area around any hole you make will form dead wood and will NEVER produce sap again. The area is typically 3 to 4 inches wide and extending 6 inches or so up and down the hole. So when you tap the tree next year, keep this in mind and pick a new area. Tapping a healthy tree does not damage it as long as it is not stressed for other reasons. There are records of the same trees being tapped for 100 years.

**COLLECTING SAP:** Sap can be collected in bags, buckets, barrels, huge stainless steel containers, etc. – pick one. Whatever you choose, it should be food safe and not subject to contaminating the sap. Sap is slightly acidic and will erode whatever you put it in if it can. If you use 5 gallon buckets, cut loose and buy food safe/food grade. You don't know what is in joint compound bucket material for instance. You can buy bags and bag holders and tubing for sap collection at many of the maple sugaring retail stores. Food grade buckets are local. My first sap collecting containers were 2 liter soda bottles with caps on them and hole punched through the top to fit over the spout.

**Sap flows** in late winter to early spring, when days are above freezing (40ish+) and nights freezing or near freezing (30ish). Sunshine helps to warm the tree tops and trunk and sap really runs on a good sunny day. Count on collecting over a gallon of sap per tap when conditions are right. Collect your sap every day if possible. After collecting the sap, treat it like milk. If you leave it out in 60 degree temperatures it is going to spoil. There are microbes in the sap that start to work on the sugars. You will see it start to turn cloudy, then left too long it will turn into a nasty smelling gel. Store it in a snow bank, put it on ice or process it. Slightly "spoiled" will produce an off-flavor. End of season comes when trees start to bud out or it is just too warm to keep the sap from spoiling. One other note: try to keep your sap clean while collecting, storing and processing. Ants, flies and other critters want to drink the sweet sap.

Birds fly over and drop little bombs you don't want in your sap. Keep the containers covered. Run your sap through some cheesecloth when you are ready to boil it down.

**BOILING THE SAP DOWN:** Same goes for the boiling containers as sap collection/storing containers. Preference is stainless steel. Ceramic coated will also work. Don't use aluminum pots. Wood heat is traditional, but a lot of producers use gas or oil heat to boil the sap. Whatever furnace you use, seal it off good so you don't get smoke rolling over the sap pan. You will get a smoke flavored syrup, which is not necessarily a bad taste in some folks opinion. The first batch I made was 20 quart roaster pans over a rock pit, with smoke a roll'n. It was really smokey – maybe would have made a good smokey-maple-bourbon drink. Load the pans about 1 to 1-1/2" deep with sap and get it boiling. Keep adding more sap as it boils down, don't let it run dry or you will scorch the batch and have to toss it.

**When is it syrup?** Maple syrup is made when the temperature of it boiling is 7 degrees above the boiling point of water. The boiling point of water is 212 deg. F at sea level and standard atmospheric pressure. Around here in Kentucky (I'm at 850 ft. elevation) it is around 210 to 211 deg. F depending on altitude and daily barometric pressure, along with thermometer accuracy. As stated above, maple syrup is defined as between 66 and 68 Brix/sugar content. Below and the syrup can spoil in the container over time. Above and sugar crystals can form. There are better methods to determine when sap is syrup. One is a hydrometer made specifically for sap. The other is a refractometer. Both will give you a better shot at when sap is syrup. I use a refractometer that reads out in Brix. Hydrometers are a little cheaper but made of glass and tend to be a little more subject to breakage. If you are going to process a lot of syrup, the more precise methods are better, unless you use the syrup up quickly.

**BOTTLING IT:** As you boil sap, no matter how well you have kept it clean, there is always stuff that gets in it. Sap also forms a compound called niter (potassium nitrate crystals). Niter makes your syrup cloudy. Niter is not harmful to ingest, but it has a little bit of gritty sensation to it. It is also called sugar sand for that reason. So it is good to filter your syrup when you bottle it. I had tried jelly bags, coffee filters (syrup doesn't go through them very well), cheesecloth, paper towels and nothing really worked good. I ended up just letting the syrup settle over a day or so,

then poured off the good stuff if I was giving it away. I used the cloudy stuff for myself. But I finally broke down and bought an orlon filter bag along with pre-filter bags. I also use food grade diatomaceous earth (filter aid) designed for maple syrup filtering, so it grabs the niter and other stuff and keeps it from clogging my filter. The filter aid is too large to go through the filters. This works out good. There are press filters made that are really expensive, but work better for higher volume syrup than my operation.

**Once filtered**, now you need to bottle it. The syrup needs to be bottled at 180 to 190 deg. F to kill out any mold spores floating around (mold spores and other bacteria are always present). Filtering usually drops your temperature too low to bottle so it is necessary to reheat it. Do so with nominal heating so you get a good consistent temperature and monitor it closely. Below 180 and you chance getting mold growth in your syrup. Above 190 or so and you will start to form more niter/sugar sand and the syrup will be cloudy. Once you fill the bottle, clean off the rim and cap it. Lay the bottles flat or upside down to “scorch” all the upper surfaces of the lid. It’s good to preheat your bottles; especially if you are filling small containers, where more glass to syrup ratio will cool the syrup without killing all the micro-organisms.

**GOOD LUCK AND HAVE FUN:** That’s about it. I’m no expert by any means. I’ve just read a lot and learned more (the hard way sometimes). There is a wealth of information on the “net” if you type in maple syrup. Much thanks goes to Dr.’s Jacob Muller and Billy Thomas from the University of Kentucky Agriculture department for coordinating Maple Day and publishing a bunch of good information. They have a part of their college of agriculture curriculum dedicated to maple syrup in Kentucky. Website is <https://ky-maplesyrup.ca.uky.edu>. Also there is a blog called mapletreader.com that has enormous amounts of information on maple sugaring.