



Boxelder syrup made in Rawlins, Wyoming. Photo by Abby Perry.

Want to make Wyoming maple syrup?

While boxelders are sometimes dismissed as “trash trees,” it turns out they contain hidden treasure: sap that can be used to make delicious syrup.

Also known as Manitoba maples, boxelders provide a great opportunity to derive a consumable product from a native Wyoming plant.

In the decade since Barnyards & Backyards published its first article (available at <https://bit.ly/wy-maple-syrup-2013>) on maple syrup production in Wyoming, the team has completed several research projects in collaboration with landowners and agencies. Here's what we've learned.

Tree selection

If you're considering tapping boxelders, whether in urban or natural areas, be on the lookout for healthy trees. Avoid trees that have wounds or didn't fully leaf out. The recommended tree size is 8 inches in diameter, but you can use trees that are smaller if needed. Smaller trees have a higher risk of negative health effects from sap collection and should be monitored closely.

Sap production can vary widely, so it's a good idea to select multiple trees. In Wyoming, we've seen trees produce almost no sap—and we've also seen a single tree produce as much as 22 gallons in a season.

Tapping trees

Trees should be initially tapped when the ground is frozen. Temperatures should be above freezing during

Do I have boxelders?

Boxelders are most common in riparian areas in quantity, but can also be found as individuals in landscaping. They are found in at least 17 of Wyoming's 23 counties, but are most prevalent in the eastern side of the state. Get permission before tapping trees not on your property.

the day, but below 32°F at night. The tapping season is generally around two to four weeks, but varies depending on weather patterns. In Wyoming, we've seen it last as long as eight weeks.

Valentine's Day is a good (and easily remembered) target date. By tapping before the sap starts flowing, you can maximize sap collection and syrup production. Taps should be pulled when trees begin to leaf out, the soil has completely thawed, and sap production ceases. Trees can be tapped every year, but a new hole should be used each season.

The “tap” that goes into the tree is called a spile. Most spiles are $\frac{5}{16}$ inches and need to be driven $1\frac{1}{2}$ to 2 inches into a pre-drilled hole in the tree. By inserting the spile $1\frac{1}{2}$ to 2 inches into the tree with light taps from a hammer, you bypass the outer bark and phloem and land in the xylem (where the sap is) without going into the heartwood.

You can use painter's tape wrapped on a sharp $\frac{5}{16}$ drill bit as a guide for drill depth. Try to stay steady while drilling so that the spile fits tight. Most spiles have a



Collecting boxelder sap in an urban setting. Sap production among these 8 trees varied between 0.2 and 3.2 gallons over the course of the season. Photo by Abby Perry.



There is frozen sap in the bucket. Photo by Abby Perry.

“collar” that will sit snugly against the tree once the spile is installed. Determine the depth to drill for your specific spile by measuring from the slightly tapered end (that goes in the tree) to the collar.

Sometimes not all sawdust created during the pre-drilling process is successfully removed; this can cause a blockage in the spile, restricting flow. If sap is running down the tree instead of through the spile into your bucket, check to see if the spile is plugged.

Collecting sap

A range of containers can be used to collect sap. Milk jugs or ice cream buckets work, but specialized collection buckets with hooks and lids are recommended. Alternatively, you can connect specialized tubing to the spile and drain the sap into a container sitting on the ground or create a collection system with multiple tubes draining into one large container.

When choosing a container, keep in mind that the sap will probably be at least partially frozen; it isn't going to pour well. You can remove and replace full containers with new buckets or empty the contents into a separate container, such as an insulated water cooler, and then re-hang the original. How you plan to transport sap, how often you collect sap, and how many

taps you manage will influence what works best for you. Sap should be collected at least twice a week; high-producing trees will require more frequent collection.

If collecting sap in a windy area, you will need to secure buckets to trees. Bungy cords, ropes, string, or wire can be used. Keep in mind that allowing buckets to continually fill full will add stress to spiles and the holes drilled into trees. Heavy buckets can weaken the wood around holes and cause buckets to loosen and lose sap.

From sap to syrup

Sap should be boiled or frozen for later processing within a couple days of collection. Fresh sap is clear and looks like water. Cloudy sap is an indicator it has gone bad. If you decide to freeze the sap to process later, filtering before freezing is recommended. This method works well if time doesn't allow you to process as you collect.

Sap should be filtered before, during, and after the boiling process. A clean sock, cheese cloth, or specialty syrup filter are all viable options. Err on the side of filtering more than less. This will leave you with a cleaner product and less sediment at the end of the process.



Boiling sap outside on a cookstove to reduce humidity in the house. The boiling temp (198°F) is easily identified on the thermometer. Photo by Abby Perry.



Filtering sap a second time during the transition from boiling outside to finishing on the stovetop. Photo by Abby Perry.

To make finished syrup, the raw sap must be boiled to remove excess water, increasing the liquid's sugar concentration. It can take hours to boil the sap down. Before starting the boiling process, determine the boiling temperature for your specific elevation. The sap must boil until it is 7.5 degrees over the boiling point to reach a finished temperature.

It's recommended to start the process outside on a burner or cookstove. The excess humidity generated during the boiling process has the potential to peel paint and/or wallpaper. As the sap boils, the color changes, the consistency thickens slightly, and the smell slowly becomes sweeter.

As the liquid boils off and "makes room" in the pot, you can add more sap (often there is more sap than what will immediately fit in the pot). Every time sap is added, the temperature will decrease slightly. It can take a long time for the temperature of the sap to change even one degree.

When most of the raw sap has boiled off and the temperature starts to increase, pay close attention to what is happening in the pot—things can change quickly. To help avoid issues, watch the thermometer continuously or set a digital thermometer with an alarm.

It's best to finish the process on a heat source that is consistent and easily controlled (e.g., a stovetop) rather than on an outdoor burner or cookstove. When syrup is almost to the finished temperature, it can easily overflow or become scorched from overcooking if not monitored carefully. Filtering the syrup again at this transition point can remove excess sediments.

The "grade" of syrup often changes throughout the season. If you are able to keep syrup from each

collection separate and process it separately, you should be able to see how the color of the finished product changes throughout the season. It's usually lighter in the beginning and darkens as the season goes on. Finished syrup should be stored in a refrigerator and can be kept in the fridge for several months.

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Abby Perry and **Brian Sebade** encourage you to join Wyoming's small but intrepid community of maple syrup producers. Sebade is a lecturer in the UW Department of Ecosystem Science and Management and Perry serves as a UW Extension educator in Carbon County. Contact Perry at ajacks12@uwyo.edu or (307) 328-2642 for a free sap collection bucket.

How much syrup will I get?

Finished syrup that has been brought to 7.5°F above the boiling temperature at your elevation is generally around 66% sugar. The amount of finished product depends on the sugar content of the raw sap, which can be determined with a special hydrometer. In Wyoming, the sugar content is typically 2–3%.

If you know the sugar concentration of your sap, you can use the Jones Rule of 86 to predict syrup yield. Divide 86 by the sugar concentration of your raw sap to estimate how many gallons of raw sap are required to make one gallon of finished syrup. For example, $86/2.5 = 34.4$ gallons of sap is required to make one gallon of syrup if the raw sap has a 2.5% sugar concentration.