

FORESTRY
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MARVIN E. SMITH

Homemade Maple Syrup

Maple syrup and sugar are among the oldest agricultural commodities produced in the United States. When European explorers first arrived on this continent, they found the Northeastern Indians managing maple groves, tapping the trees, gathering the sap, and consuming maple syrup and maple sugar. The newcomers were not long in imitating them and later improving on their methods.

Vermont and New York have the largest amount of maple syrup production. Until rather recently, maple syrup and sugar have been strictly a "sideline" farm crop; however, the production of maple products is often a full-time operation.

Maple syrup and sugar is one agricultural crop in which there is no surplus. In fact, demand far exceeds available supply. The industry is not expanding, even though less than one percent of the potential resource is being used.

While there are several species of maple trees growing in Minnesota, only two are used in the commercial production of maple products. These are sugar maple (*Acer saccharum*) and black maple (*A. nigrum*). Sap suitable for processing into syrup may also be obtained from red and silver maples, although such sap usually has a lower sugar content.

Sugar maple is a common tree throughout the forested regions of Minnesota. It is most abundant in the east and north portions of the state. In addition to its use for sap production, it is a valuable tree for lumber, and is used extensively in fine furniture. In addition, it has been widely planted as a shade and ornamental tree.

Necessary Equipment

Maple syrup can be produced with a minimum of equipment, but a few standard items increase efficiency of the operation and quality of the product:

- a drill with a 7/16- or 1/2-inch bit,
- a metal collection spout for each taphole,
- a collection container (bucket or plastic bag) or tubing line for each taphole,
- metal trash cans with plastic liners for sap storage,
- a large pan and heat source for boiling down the sap (size will depend on amount of sap involved),
- a large-scale thermometer calibrated at least 15 degrees above the boiling point of water,
- wool, orlon, or other type filters for filtering finished syrup while hot, and
- storage facilities and containers for the finished syrup.

Tapping the Tree

To obtain the earliest runs of sap, tapping should be completed by early March in central and southern Minnesota and

by the first week in April in the northern portion of the state. The smallest trunk diameter for trees suitable for tapping is 8 to 10 inches at 2 to 4 feet above the ground. For best sap production, a tree should have a short bole topped with abundant foliage; good management of a maple grove consists largely of cutting practices which favor the development and retention of such trees in the operating sugar bush.

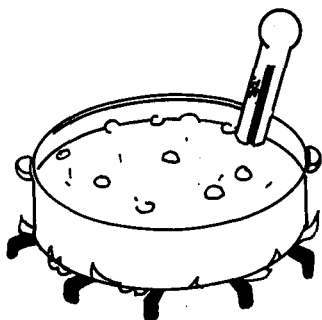
To tap a tree, select a spot on the trunk about two to four feet above the ground in an area of the trunk which appears to contain sound wood. At this point, drill a hole approximately three inches deep into the wood, slanting it slightly upward to facilitate the downward flow of sap. A collection spout is then inserted and tapped lightly into the tree, and a bucket or plastic bag, or a tubing line attached to the spout. If open buckets are used for sap collection, a cover should be installed to exclude rainwater and other debris.

Collecting the Sap

Sap flow from maple trees will not occur every day throughout the tapping season. Instead, it occurs on those days when a rapid warming trend in early to midmorning follows a cool (below freezing) night. Thus, the amount of sap produced on a given day varies. Normally, a single taphole produces from a quart to a gallon of sap per flow-period (ranges from few hours to a day or more) with a seasonal accumulation of 10 to 12 gallons likely.

Sap should be collected and boiled down as soon as possible to produce high quality syrup. Where this is not always possible, collections during prolonged flow periods should be made as required, not exceeding every two or three days. During periods of rather low temperature and under favorable storage conditions, sap may be kept four or five days without reducing syrup quality. If sap is allowed to become warm before boiling, a darker syrup of poor quality may result.





Boiling the Sap (Making Syrup)

The amount of sap required to produce a gallon of maple syrup varies, depending on its sugar concentration. Sap averages approximately 2 percent sugar. At that concentration, 43 gallons of sap are required to produce one gallon of syrup. Sugar concentrations above 2 percent require less sap, and those below 2 percent require more sap for producing one gallon of syrup.

In large commercial operations a continuous feed evaporation process is used. The evaporation pan is arranged so that sap may be continuously added and drawn off. In smaller operations a batch approach is used. The evaporation pan is filled with sap, and more sap is added as necessary to replace that lost by evaporation. When a suitable amount of concentrated sap is present, the pan is "finished-off" to produce the correct density syrup.

To begin the process, fill the evaporating container (preferably a large shallow pan) with sap. Begin heating the sap to the boiling point, taking care not to burn or scorch the sap. A Teflon-coated pan is ideal. As the level of sap in the pan is lowered through evaporation, add more sap. This process is continued until most of the sap in the pan is highly concentrated, and the boiling point of the liquid begins to rise above the boiling point of water.

Throughout this process, it may be necessary to occasionally skim the surface of the boiling liquid to remove surface foam and other materials. Finished syrup boils at seven degrees above

the boiling point of water. As the temperature of the boiling sap approaches this point, boiling should be carefully controlled to prevent burning and overheating.

The process of making maple syrup is essentially one of concentrating the sap (sugar solution) to a predetermined level by boiling it. The heat applied in the process develops the characteristic color and flavor that give maple syrup its highly desirable properties.

Once the desired boiling point has been reached, the syrup is ready for filtering and packaging. Syrup should be poured while hot through a suitable wool or orlon filter. This will remove suspended particles, such as sugar sand, and improve the appearance of the syrup. After filtering, the syrup should be packaged at a temperature above 180° F, preferably about 185° to 190°, so that the heat sterilizes the container. Place filled and capped containers on one side so the hot syrup sterilizes the cap. After cooling, store in a cool, dry place.

Other Maple Products

Maple syrup may be converted into other highly desirable products. Maple sugar, maple candy, and maple fudge are just a few of the many other products which can be made. Basically, these are produced by concentrating finished syrup to a greater density and stirring the highly concentrated syrup. Recipes for a variety of these products may be obtained at your local county extension office or by writing to the College of Forestry, University of Minnesota, St. Paul, MN 55108.

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