



FORESTRY EXTENSION NOTES

MAPLE SYRUP PRODUCTION IN IOWA

Maple syrup is one of our oldest agricultural crops and is one that is solely North American. Iowa is not generally thought of as being a maple producing state, but it does have a few commercial producers of maple syrup in the northeastern part of state. On a small scale, home production basis, maple syrup can be produced in Iowa. All you need are a few maples at least 10 inches in diameter, a little inexpensive equipment, and a way to boil down sap outside the house. This, plus your efforts in time and care, can give you a few quarts or gallons of high quality maple syrup.

Maple Species

Sugar and black maples are the best sources of sap. Silver maple and boxelder can also be tapped, but the volume of the final product will not be as high, and quality will be lower than that of syrup from hard maples. The sap content of silver



Sugar Maple

make the finished syrup cloudy. They also tend to break bud at an earlier date than sugar and black maples causing an unpleasant flavor in the syrup

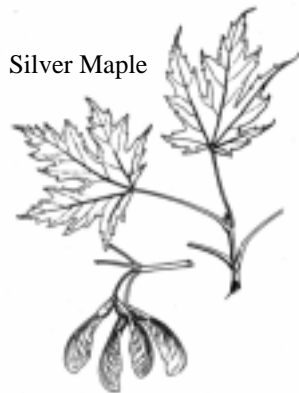
Tapping the Trees

Sap collection in Iowa begins in late February or early March. Ideal conditions exist when nighttime temperatures drop below freezing and daytime temperatures are mild. Stop collecting sap just prior to or at the very early stages of bud expansion and development in late March or early April, depending on weather conditions. Sap collected and processed into syrup after bud break will result in "buddy" syrup, which has a distinctly unpleasant flavor.

Make tapholes by boring into the trees using a carpenter's brace and a 3/8 or a 7/16 inch fast-cutting wood bit. Bore the holes to a depth of 3 inches (not counting bark) into sound wood, from 2 to 5 feet above the ground. Slant the hole slightly downward to allow the sap to run out. On trees that have been tapped before, locate new tapholes 6 inches to one side and 4 inches higher than the old taphole.

When possible, space tapholes evenly around the tree, with the number of tapholes depending on the diameter of the tree. Do not tap trees under 10 inches in diameter. Use one tap for 10 to 15 inch trees, two taps for 16 to 20 inch trees, three taps for 21 to 25 inch trees, and no more than four taps on trees over 25 inches in diameter.

Tapping maple trees reduces the value of the tree for lumber or veneer but generally does not harm



Silver Maple

maple and boxelder is usually lower, thereby requiring a larger volume of sap to produce a given volume of syrup; the sap of the two species may also contain excessive amounts of sugar sand which can

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or reduce the growth rate of the tree. If the tree is not healthy and vigorous, the taphole may also serve as an entry point for decay or disease organisms.

When sap begins to flow from the hole, you will need a device to convey the sap from the hole into a sap container (bucket or plastic bag). The *spiles* or *spouts* usually have a tapered shoulder which forms a water-tight seal with the bark and outer sapwood when they are driven into position in the taphole.

Collect sap and boil it down as quickly as possible to produce good tasting syrup. Collect the sap often. Buckets should be covered to keep out rain and other foreign materials. Good sanitation and rapid handling of the sap from the tree through evaporation and packaging is extremely important in producing good quality maple syrup. When the air temperature is warm, bacteria and other microorganisms can build up in sap that is kept in buckets or storage tanks for more than a few hours. Keep buckets, storage tanks, and other equipment thoroughly washed between runs. Washing with a solution of one part bleach and nine parts water will usually maintain collecting vessels in clean condition.

Boiling the Sap to Syrup

Maple sap averages around 2% sugar content. The problem is to remove enough water to get a sugar concentration of about 66%. Actual sugar content in sap varies widely from tree to tree and from season to season. For sap at 2% sugar content, 43 gallons of sap will be required to produce one gallon of syrup. The average taphole will produce approximately enough sap to produce one quart of syrup.

Maple sap is concentrated to syrup by boiling it in an open pan. For boiling at home, it is important to have a device for removing water vapor to some point outside the home or to do the actual boiling outside. The evaporating container should be a large open pan with high sides filled with sap and exposed to heat. As boiling begins, foaming will occur. During the boiling process, be careful not to burn or scorch the sap. As boiling begins and water evaporates, add more sap to the pan. Continue this process until a

suitable amount of concentrated sap is left in the pan. Concentrating the "batch" to an acceptable density is a process called *finishing off*.

Finished syrup of acceptable density will boil at 7 1/4°F above the boiling point of water. Since boiling point varies from location to location and from day to day, the boiling point should be determined each day. For home production of syrup, a candy thermometer is acceptable for determining boiling points and finishing syrup.

As the temperature of the boiling liquid approaches the syrup finishing point, take extreme care to prevent the boiling process from burning, scorching, or overheating the liquid.

Once the syrup has reached the desired boiling point, it is ready for filtering and packaging. Filter the hot syrup through clean filters of wool or Orlon to help remove the sugar sand and other suspended particles.

Maple candies are made by boiling the sap or syrup to higher temperatures. Sap boiled 22° to 40°F above the boiling point will yield a thin, glassy, taffy-like candy when poured on ice or snow. Maple cream is made by boiling 22° to 24°F above the boiling point, then cooling to fifty degrees and blending with a wooden spoon or low speed mixer.

Reference

Koelling, Melvin R. & Randall Heiligmann.
1996. North American Maple Syrup Producers Manual. The Ohio State University Extension Bulletin 856.

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