



December, 2007

Tapping Bigleaf Maple



Photo courtesy of Gary Backlund

Bigleaf maple (*Acer macrophyllum*) is one of North America's most abundant and yet underutilized hardwood species. There are more than 2 million m³ of this tree growing on low-elevation coarse, moist soils among other hardwood and coniferous trees in southwestern British Columbia, primarily on Vancouver Island and the Gulf Islands. In addition to the multitude of environmental values provided by this native tree (habitat for a variety of different lichens,

mosses and other forest-dependent species), bigleaf maple have a wide range of end uses. These include specialty wood products and utilizing its sap for syrup and other food or natural health products. Although hobbyists have tapped these trees for decades, they have only recently been the focus of a growing cottage industry utilizing niche marketing for their unique, regional products. Tapping bigleaf maple offers a sustainable option for

diversifying forest and agricultural operations in southwestern British Columbia.

Sap Collection and Handling

Unlike the eastern sugar maple (*Acer saccharum*), sap flows in the mild climate of the West Coast are not dependent on a spring thaw. Thus, a much longer tapping season is possible in BC 'sugar-bushes'. Sap flows start in December and tapping can safely begin in January and extend through to March. Peak sugar content in the sap is generally early in the tapping season.

On average, a healthy tree will produce 60 litres of sap per season, but finding the best trees to tap is more of an art than a science. Research to find indicators for choosing the best trees and time to tap has met with limited success. In general, open grown trees with vigorous growth will produce the most sap; trees in dry sites or during drought are generally poor producers. The presence of Sapsucker (*Sphyrapicus rubus*) holes in the stem generally indicate a tree with good sap flow.

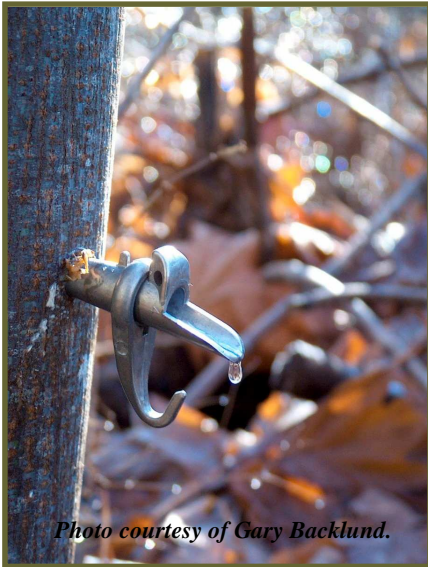


Photo courtesy of Gary Backlund.

Smaller diameter trees can be tapped, but stems 25 to 45 cm in diameter are generally best. Tap holes are typically 11-mm in diameter, drilled 6 cm into the tree at a slight upward angle. Sap is perishable and must be collected daily, stored properly and processed promptly. For small operations (fewer than 100 spiles), sap can be collected in food-grade containers at the tree and transferred to a central storage container daily or more frequently as needed. For larger operations, installing a pipeline system to transport sap from individual trees to a central collection point will reduce labour. To set up a gravity-assisted pipeline, first remove standing dead trees and clear the pipeline route of ground vegetation and obstacles. Next, string and tighten the wire hangers at a minimum slope of 7%. Attach 13-mm black 'poly' pipe from the wire hangers at 60-cm intervals and splice in manifolds to connect blue 7-mm tubing that runs to anchor trees.

Then splice in drop-lines to the 7-mm tubing. Each drop-line consists of a 'tee' and a short piece of tubing. To complete the system, drill tap holes into the trees, insert spiles and connect the drop-lines.

Processing Sap for Syrup

The process of making syrup from sap is similar to that for the sugar maple. Water is evaporated from the sap to increase sugar content to 66% (66.5° on the *Brix scale*). Raw bigleaf maple sap typically contains 1.75 to 2.00% sugar, thus it takes about 50 to 60 litres of sap to make 1 litre of finished product, slightly more than for the sugar maple. For the best economic returns, trees should only be tapped during periods of maximum sap flow and high sugar content.

Raw sap must be filtered prior to processing to remove foreign materials. Ensure that all of the

equipment used is food-grade and clean it regularly with diluted household bleach or a commercial cleaning solution. Evaporators should be scaled to the operation size. A small raised-flue pan will evaporate 100 litres/hour whereas a similar sized flat bottom pan will evaporate only 25 litres/hour, using the same amount of fuel. However, even though it is four times more efficient when filled to capacity, a raised-flue pan is inefficient for processing less than 400 litres of sap. It is easier to control the temperature to achieve the final syrup sugar content without scorching by using a small finishing evaporator on partially reduced sap. Bottle finished syrup while it is hot (>82°C) and sterilized from boiling. Place hot capped bottles on their sides to create a vacuum seal. Bottled syrup must be refrigerated after opening.



Photo courtesy of Harold Macy.

PLAN

- How and where you will market the syrup?
- Do you have access to a suitable stand to trees?
- Can you commit the necessary time for collection and processing in the sugaring-off season?
- Do you have the appropriate collection and processing equipment and adequate fuel?

ASSEMBLE

- Drill and 11-mm bit.
- Spiles, tubing and connectors.
- Containers for collection and storage.
- Filter paper or cloth.
- Evaporator (s).
- Fuel (1 cord of wood per 70 litres of finished product or a steady supply of natural gas, propane or heating oil).
- Thermometer, hydrometer or refractometer.
- Bottles and lids for syrup.
- Solution for cleaning equipment (1 part household chlorine bleach to 19 part water).

SELECT

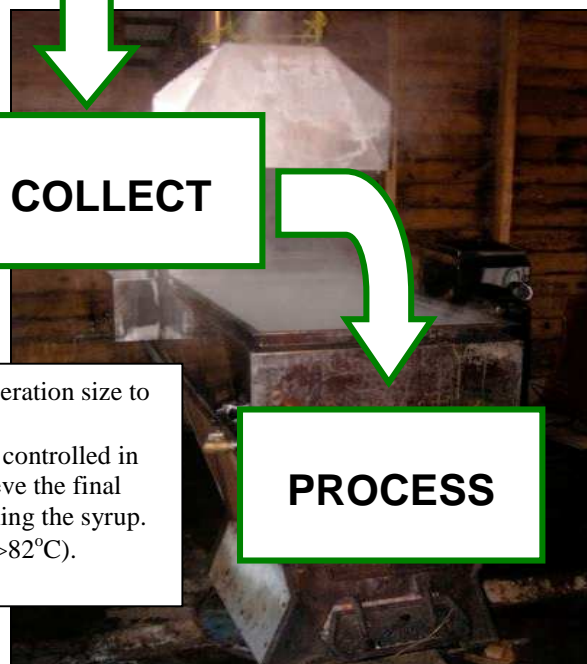
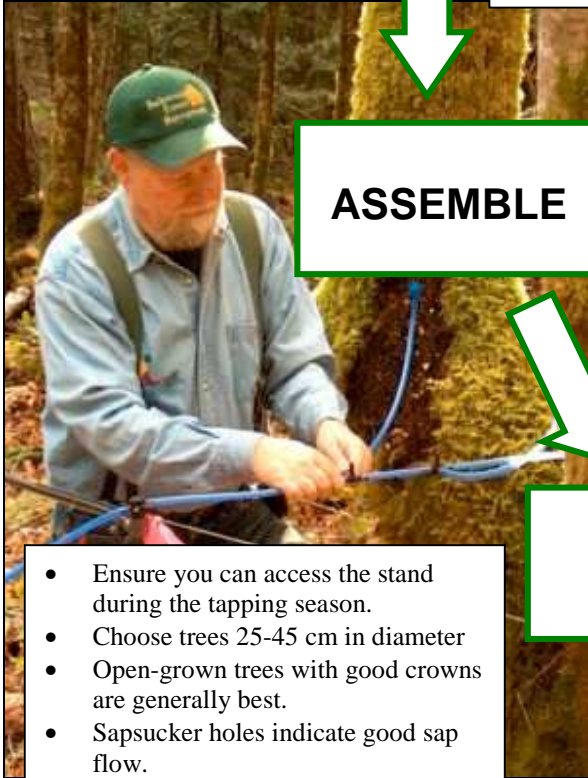
- Ensure you can access the stand during the tapping season.
- Choose trees 25-45 cm in diameter
- Open-grown trees with good crowns are generally best.
- Sapsucker holes indicate good sap flow.

COLLECT

- Follow *Good Agricultural and Collection Practices* – keep records.
- Collect sap daily or more frequently as needed and process promptly.
- Use food-grade containers and clean them regularly.
- Filter raw sap before processing.

PROCESS

- Use evaporators scaled to operation size to achieve the best efficiency.
- Temperature is more readily controlled in small finishing units to achieve the final sugar content without scorching the syrup.
- Bottle syrup while it is hot ($>82^{\circ}\text{C}$).



Products and Markets

Bigleaf syrup's rich taste makes it exceptional in cooking and it is desired by restaurants wanting a unique, 'West Coast' flavour. Syrup can be used to flavour snacks (e.g. popcorn) or to create candies and other confectioneries. Syrup is the primary use; however, maple sap also has other uses. It contains many essential minerals and vitamins with the potential for a natural health product. As a substitute for water in most recipes it imparts a slight sweetness and hint of maple flavour. Both maple wine and maple beer are being produced on a limited basis. Most bigleaf tapping operations do not generate large amounts of syrup and do not have the volume or economy of scale to compete in the bulk retail market. Thus, most producers

market direct to the consumer. Bigleaf syrup can gross between \$15 to \$20 per 250-ml bottle.

For More Information

"Bigleaf Sugaring: Tapping the Western Maple" by Gary and Katherine Backlund. Published in 2004 by Backwoods Forest Management, Ladysmith, BC.

BC Agroforestry Industry Development Initiative

www.woodlot.bc.ca/agroforestry/

InfoBasket

Agri-food information, including a dedicated agroforestry portal.

www.infobasket.gov.bc.ca

Good Agricultural and Collection Practices for Maple Syrup Production

(Ontario Ministry of Agriculture, Food and Rural Affairs)

www.omafra.gov.on.ca/english/food/inspection/maple/maple_prod_food_safety.htm

Acknowledgments

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