INTERMEDIATE MAPLE SUGARING KIT

TIRED OF PICKING UP BUCKETS?

ERA-SIROP60
Background

The basic process of converting maple sap to syrup still requires the removal of water from the raw sap to form the finished sweet product. Most novice producers find the experience of producing maple syrup rewarding far beyond the sweet product of their labor. After a few years of experience, many beginners develop a level of enthusiasm that advances them to commercial-size maple production. This manual provides instruction for those producing maple syrup for the first time, primarily for home or family use.

With our intermediate maple sugaring kit, you will be able to produce about 1 liter of syrup with 10 buckets of sap. In the season, it’s possible to collect between 100-155 US gallons.

Remember, although you may want to improvise to minimize production costs, maple syrup is a food product and should be produced only with equipment and materials that are approved for food application.

Maple species to tap

Although several types of maples grow in Northeast America, sugar maple (Acer saccharum) is the traditional species tapped for maple syrup production. The sap of the sugar maple generally contains a higher level of sugar than the other maples. Identify sugar maple by its bark, its dark, brownish-colored, sharp buds, and its five-lobed leaves.
It is quite easy to recognize the sugar maple tree in summer, but harder in winter. When possible, we recommend you identify trees during summer. If you cannot, refer to the following instructions:

1. NO THORNS
2. HAS OPPOSITE BUDS THAT DO NOT ALTERNATE
3. “SCALE” BUD HAVING MORE THAN 2 SCALES
4. END BUD IS SMALLER THAN 2.5CM, 1”
5. HAVE A FOLIAR SCAR
   (WHERE A LEAF WAS ATTACHED) TIGHT SCAR, NOT IN V OR U SHAPE.
Equipment:
The followings are included in the 10 taps maple sugaring kit:

- Green H2O Innovation semi-flex tubing 5/16" (2): ERATUY5/16H2OSR-V
- H2O Innovation tapping bit 1/4" (1): ERA412107H
- PVC reducer bushing 3/4 à 1/2": SPE439-101
- Black spout 1/4" (60): ERAH2O708
- Long female tee-plug 5/16" (54): ERAH20713
- Black end of line elbow hook (6): ERAH20817
- Plastic valve for tank 3/4" (1): ERABARROB3/4
- Slide fittings for 5/16 tubing (6): ERAH20815
- Hook for slide fittings (6): ERAH2081525
- Union hook (6): ERAH20813
- 6-way star 5/16" x 1/2" NPT (1): ERAMJM756
- Wooden hammer (1): ERA412MARTEAUC
- 12V pump (1): SHUMA532-12V
What you will need but is not included:

/ A drill for tapping.
/ Snipper or pliers.
/ A food grade barrel to accumulate sap from your flex tubing (suggested capacity of 45 to 55 US gallons).
/ A cooking pot (aluminum or stainless steel) and a heat source.
/ Food grade syrup filter.
/ Another pot to transfer the finished syrup in.

NOT INCLUDED:

Barrel, drill, cooking pot and heating source
7 EASY STEPS

Why replace buckets with flex tubing? Simply to save on handling and time for sap yield but also to get the benefit of natural vacuum in gravity tubing.

For a small installation, the only flex tubing you will need is the 5/16” provided in this intermediate maple sugaring kit. The 60-tap kit includes all the material to tap 60 maple trees, this means 6 lines of 10 taps each, all lines going to the same tank (barrel not included).

The best time of the year to install tubing is in the fall, when there are no more leaves on the trees and before it snows. In those conditions it is easier to evaluate the slope of the land.
1- LAND RECOGNITION

The first step is to clean up your woods. It is easier to layout your tubing when you see properly the land slopes. Identify where the maple tree concentration is the highest, then locate the low point where the sap tank will be located.

**FLAT GROUND:** End of line maple tree is the furthest from the sap tank.

**SLOPING GROUND:** End of line maple tree is the highest one. The lowest tree closest to the sap tank.

**SAP TANK:** Locate the sap tank as low as possible. The tank is the center point for tubing installation. Minimum slope should be 3%.

Do not install the tubing on 360 degrees as it will be difficult harvesting sap.
2-MEASURE AND SELECT YOUR MAPLE TREES

Use a flexible ruler to determine tappable trees. No trees should receive more than 3 taps. Measurements should be taken 4.3 ft above ground.

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<th>DIAMETER</th>
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<td>cm</td>
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<td>&lt; 20</td>
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<td>50 1/4 to 74 1/8</td>
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<tr>
<td>&gt; 23.6</td>
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<td>&gt; 74 1/8</td>
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3-TUBING INSTALLATION

DROP ASSEMBLY

For sixty (60) taps you will have sixty (60) drop assemblies: two (2) end of line drops with elbow hook and fifty-eight (58) drops with long female tee-cup.

End of line drops with elbow hook (2)

Drops with long female tee-cup (58)
The procedure below is to be repeated for each of your 6 lines. To install the droplines a tubing installation tool may be used. A thermos of hot water is useful to facilitate fittings insertion in the tubing. Do not use your mouth for warming the tubing, this introduces bacteria in the system.

TUBING SYSTEM INSTALLATION

IMPORTANT: Droplines must be positioned upwards and the cup towards you, opposite the tree. Spout directed towards the tree.

Use an end of line drop with an elbow hook. Insert the open barb into the roll of the flex tubing.

Start at the end of line tree with a roll of 5/16” tubing and weave it around it. Hang the tubing with the end-line.

Make a closed loop with the drop, store the tap in the cup.
Start at the end of line tree and weave the 5/16 tubing around tappable trees. Tubing must touch all trees that will be tapped.

Make the lines as straight and tight as possible to avoid air pockets. Presence of air pockets will lead to less efficient sap yields and will have an impact on sap quality, and also maple syrup quality.

At the maple tree closest to the sap tank, go around it completely with the tubing. Before cutting your tube ensure you have long enough tube to connect to the 6-way star on the sap tank.

To tighten your tubing system you will need, for each of your lines, 1 slide fitting, 1 hook for slide fitting and 1 union hook.

DROP INSTALLATION
IMPORTANT for drop installation, drops must be directed upwards. The cup of the long female tee directed upwards, opposite to the tree. If you have not yet tapped your tree, make a close loop by storing the tap in the cup. This will help keep your tubing system free of bacteria.

It’s up to you to choose the length of your drops. They can be from 24” to 42”.

If more than one tap is to be placed in the same tree, distribute the tap holes equally around the circumference of the tree.

In this guide we suggest three (3) techniques for drop installation.
For the use of this method, it is recommended to have two people. Leave the 5/16” tubing hanged and tight. Cut the tube where you want to place the drop; do one drop at the time. Your colleague will be able to hold the 5/16” tube and maintain its tension while you are inserting the drop line tee into the 5/16” tubing.

Do so for all your drops.

Retighten the system using hook and slide fitting.
2-Using a marker pen, indicate where to cut the tube for each drop.

When marked, unhook the system. Cut the tube and install the drop line tee into the 5/16” tubing, again one drop at the time. Always position the drop upwards, the cup positioned towards you, away from the tree.

If you have not yet tapped your tree, make a close loop by storing the tap in the cup.

Starting by the end of line tree, reinstall the tubing system while maintaining an equal tension on all the system. It is important not to have an air pocket in the tubing system.

Retighten the system using hook and slide fitting.

3-Using installation tool. The double vice tool is being used to insert the drop line tee into the 5/16” tubing. Those vice tools are used to facilitate and speed up drop installation. You can buy them from H2O Innovation or from your distributor.
4- **TAP THE TREES**

Trees were measured before tubing installation; you know their size and the number of taps to put in.

Tap maple trees in early spring when daytime temperatures go above freezing while nighttime temperatures fall below freezing. The exact time depends on the elevation and location of your trees and your region. Sap usually flows for 4 to 6 weeks or as long as the freezing nights and warm days continue.

Drill a hole 1”1/2 to 2” deep. Drill straight in. Before inserting the spout in the tap hole, ensure there is no wood chips around and in the hole. Insert the spout, gently tap it with the hammer provided in this kit.

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5- **HARVEST MAPLE SAP**

The volume of sap collected per tap during a flow period will vary from less than a quart to several gallons, depending on the tree, weather conditions, and duration of the flow or run. The sugar content of sap varies between trees, it will fluctuate within the season, and from year to year.

This kit includes a 12V submersible pump. The pump has an integrated filter to remove debris from the sap.

Collect sap daily if possible. Sap can temporary be stored in a big and clean food grade tank for more convenient processing. The storage container should be placed in the shade to keep the sap as fresh and cool as possible. Because sap is a mixture of sugar and water, it is a perfect medium for bacterial growth. Therefore, it should be collected and processed as quickly as possible to ensure a higher quality product.

Shelf life of sap will vary and is dependent on many factors: outdoor temperature, bacterial contamination, sun exposure, and SAP quality. It can be stored between 1 and 10 days in the bucket. If sap is having a whitish-color, sap is contaminated, and you should dispose of it (if you make syrup the taste will be unpleasant). To clean all sap collection equipment, do a mixture of one-part odorless bleach for 20 parts clean water, use a clean cloth or brush.
6-Boil the Sap

Usually about 40 gallons of sap are required to produce one gallon of finished syrup. This figure can vary from 20 to 60 gallons or more depending primarily on sap sugar content. A large amount of water must be evaporated from the sap to obtain a finished syrup containing 66% of sugar (66 Brix°). Because the large amount of steam caused by evaporation of the sap could be damaging to interior wall surfaces, the bulk of the boiling should be done outside of the home. However, this can be done inside the house if you have a good kitchen hood (steam will not damage the hood).

We recommend that you use a pot above an open fire, camping stove or a wood or propane fireplace. Before turning on your heat source, fill your pot with about 3-4 inches of sap. Throughout the boiling process, ensure the liquid level is sufficient (about 1”1/2) so that the sap will not burn and will not damage the pan. As the evaporation progresses and the sap level decreases, add sap. The faster it boils, the greater the potential for producing a high-quality product. This "batch" method allows the sap to be processed to a point near the final stage of evaporation.

Sap becomes syrup (66 Brix°) at approximately 7°F above the boiling point of water. Water boils at 212°F, proper density for syrup would be slightly over 219°F. Concentrations below 66% sugar content can sour over time. If boiled above the 67% density of syrup, sugar crystals can form in the bottom of storage containers. The boiling point of water, which varies with elevation and daily changes in barometric pressure, is easily determined by noting the temperature in the raw sap when it is boiling vigorously.

Throughout the process, excess foam may be skimmed off the surface of the boiling sap and discarded. Use a certified defoamer. Using other products may be potential allergens. When used in small quantities, defoamers will evaporate without a noticeable trace in the syrup.

You can clean your sap boiling equipment with hot water.

Making maple taffy: If you want to make maple taffy, increase the temperature to 238°F and follow the previous steps. Then do a test on snow: if consistency is too hard, add a little water; if it’s too liquid, boil a little again.
7-FILTERING

When syrup has reached its proper temperature and density, it should be filtered to remove a gritty material called "sugar sand" or "niter" before hot packing in containers. Syrup must be filtered through a clean food grade syrup filter. Install the syrup filter on a suitable sized pot. See picture below.

BE CAREFUL NOT TO BURN YOURSELF, USE GLOVES!

Syrup should be canned hot (180°F) and stored in a cool dry location or under refrigeration. After a container has been opened for use, it must be refrigerated.

Use only hot water when cleaning your sap and syrup filter. At the end of the season after cleaning in the manner described above, store equipment and supplies in a dry place.

Conclusion

We hope you enjoy making maple syrup! Please feel free to contact your H2O Innovation dealer of our head office in Ham Nord, Qc at (819-944-2288 or at erabliere@h2oinnovation.com or visit our website www.h2oinnovation.net.