

**A past summary of Saint John's maple syrup process written by Walter Kieffer, OSB and edited by Dr. Stephen Saupe.**

## **Syrup Jugs & Spiles**

Jugs are stored in the apple cellar in or near the maple syrup cage. Brother George or Walter has the keys for the cellar and this cage.

The jugs are hauled to the lower level of the Abbey and lined up in the corridor. These are then cleaned in the deep sinks of the old wine room which is now the "events room" in the lower sacristy.

Cleaning procedure: Fill one tub with hot water to a depth that will allow the flooding of jugs. Add a good supply of soap. The regular dish soap will work, but in the past the dish soap from the kitchen dishwasher was used; there seems to be less trouble with rising. The regular dish soap takes longer to rise. The goal is to have a very clean jug without any soap residue. It is good to let the jugs soak over night after a few fills and dumps.

The next day put a little grit into the soaked partly filled jug and swirl around to remove any scale inside the jug. Drain through a cloth or screen to catch the grit. The jug is ready to rinse in clear water. The last rinse should be with clean hot water. The hot water will remove the last of the soap and warm the jug for better air drying.

The jugs should be placed upside down to drain and air dry.

The jugs are then placed back out in the hallway and covered with a clean sheet to keep the dust and dirt out.

This is normally a three-work period job with each step repeated each shift. Normally 300 to 400 gallon jugs are used for the season.

Spouts should be checked over and the damaged ones separated. The good ones are brought up to be washed with the jugs. These should be rinsed well to remove all soap. Alternately, run them through the dishwasher in the kitchen on the silverware racks. Dry before putting them back in the containers.

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## **Bags and Covers**

The putting together of the bags and covers should be done ahead of time. The bags should be ordered by the first of February. The general start of tapping is the last week of February. By this time all should be ready to go.

Bring the covers and bags up to the Abbey and stack them as neatly as possible in the niche along the lower corridor. Put up a sign about a bagging party in the lower recreation room for after office some night or nights. This could also be done in the afternoon and a few may come. Another possible site is in the health center if someone up there is willing and able to help out.

The bag is placed inside the ring piece and then folded down and around the ring. If the bag is only placed over the top of the ring it can slip off with a load of sap, so it is important to have the bag folded around the bottom of the ring too.

Next slide the ring back into the cover/holder and pull into the grove. Starting at the bottom of the bag roll it up and into the cover. This method protects the bag the best against holes while in the boxes.

The boxes are taken right out into the woods at the time of tapping.

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## Tapping

Some sort of drill to bore a 7/16" hole about 3" deep into the tree. The hole should be at a slight upward angle to allow the flow out of the tree. We have used the bit mounted on the shaft of the chain saw power head. This allows for a fast hole to be bored. It does take a left or reverse twist drill.

There is also a small gas powered drill that is slower and more temperamental to run. There are many of the battery powered drills around that could be tapped into use for a day or two. The last resort is always the hand brace if such is to be found any more around here.

The person tapping should know the maple tree and the maple tapping area, or have a person along who can point out the right trees.

As the tree is approached it should be sized so one can put in the maximum number of taps without damaging the tree. The general rule is 10 - 14" one tap, 15 - 19" two taps, 20 - 24" three taps and 25" and up can have 4 taps. This should be the diameter of the tree at the height one is tapping at. One should also spot the old tap marks, the last few will still be visible. One should stay at least 4 inches on the horizon and 6 inches on the vertical away from the old hole. Usually the wood right in the old hole is dead wood and not sap producing. It is important when placing multiple taps in one tree that they are far enough apart to allow each cover to be hung without interfering with the one next to it.

There should be two persons carrying two boxes of covers and bags. One bag unit should be placed below each tap hole. This marks the tap and allows for the person setting the spile to find the hole.

The person or persons placing the spiles or spouts will have a pail with the spiles and claw hammer. Install the spout into the hole so the lip of the tap is down and the cover/holder catch notch in the up position. If the bark is deep or thick to the first layer of live tree, the claws of the hammer are used to peel off some of the old bark, allowing the holder/cover to be hooked well. Tap the spout in softly, a hard blow may crack the tree causing the sap to drip outside of the bag. Unroll the bag and check to see if the bag is properly attached. Hang the holder/cover on the tap. Look in from the side to see if the sap will drop into the bag. If the bag is hanging at an angle so that the sap is hitting on the ring of either the front or the back some adjustment is necessary. Sometime the lip can be bent down a little with the claws of the hammer. Sometimes it may have to be straightened so the sap goes into the bag. That is it.

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## Collecting

Persons collecting should come out to the Maple Shack (transportation can usually be provided). Pails for collecting from the trees will be provided for you. It is much easier to use two pails than one, even if you will only partly fill them.

With the bag system one can see at a distance if a bag has been collected or not. When you come up to the bag, lift the holder/cover up over the stop on the spile and slide it off the spile. Hold the handle of the holder/cover and with the other hand start to lift the bag to dump it into the pail. If the bag is over half full, it is best to cradle the bag from the bottom to dump it. This will avoid stretching or tearing the corner of the bag. When the bag is empty, replace it on the spile and check it to see if the drips are going into the bag.

When the pails are full or as full as you wish to carry, proceed to the nearest barrel and dump your pails into it. There should be a cover for the barrel, please place it back on the barrel to keep out rain. These barrels will be gathered with the tractor and tanker to be brought up to the shack. When the gathering is finished for the day, please bring your pails back to the shack. Stager stack them upside down along one wall of the shack on a board. This allows them to drain out and dry. Sap left in the pails will sour fast and inoculate the fresh sap collected.

Check the oil and fuel of the tractor before starting. Place the pump on the wagon, make sure the drain plug is back in and that the fuel tank is full. Check the oil before leaving. Have a pail and the screen/funnel on the wagon.

Follow the trails as close as possible. If the going is getting too tough in spots, come out with only partial loads and fill up along the better roads even if it means going back in several times to one area. If you are starting to dig in with one wheel, try to use the break on that side and get the other wheel to pull. Never dig in so far that you can not get out after unhooking the tanker. Once out of that spot, pull the tanker through with a chain hooked low on the draw bar of the tractor. Always drive safe, all the sap is not worth one accident.

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## Cooking

Our cooker is a 16 foot, three pan evaporator that, with good method and fuel, will boil off 175 gallons per hour (one tanker load) when in full swing. The quality of the syrup is directly related to the time it takes to cook it, the longer the time the darker the finished product in relation to the sap collected. The three pans are all separate but are joined with flow passages on the outside cups. The back pan is the main cooker with its 6" deep flues where all the hot gases of the fire flow through. It has four passes; therefore the sap entering through the float valve goes through the four channels before leaving this pan. The center pan has a flat bottom and is divided throughout the center; each side has a baffle with a flow through near the center. The sap coming from the first pan runs through the one side of this center pan before leaving flowing into the front pan. The front pan is about 4 feet and sits right over the fire box. It also has four passes with a corrugated bottom to maximize the heat transfer. The hottest boiling goes on in this pan and the color changes from a clear to a brownish as the sugar is concentrated. After this pan the flow again goes into the center pan, but on the opposite side it did before. Here the syrup concentration increases and is drawn off.

Usually the draw off is made when the test comes near to 30 degrees on the Brix hydrometer or as high as can be achieved without the final pan foaming over. (Late in the season, this may only be 15 - 20). The draw off is done by opening the quick open valve on the side of the cup. The syrup goes into one of the cream cans, which is set up with a breather tube under the thick filter holder that contains one of the paper filters inside. These are referred to as the diapers, as it collects the sugar sand which are the minerals carried into the tree with the sap. It is a little more than half finished at this stage, but to cook it any longer in the big stove would slow the process down as it tends to foam more the closer the syrup comes to finishing. If the concentration is close to being finished it is harder to filter and the sugar sand can build up on the center pan. If this occurred across the whole pan, the bottom could literally melt through. The flow is switched from one side to the other every 24 hours of operation in order to prevent sugar sand build up.

Make sure you have enough sap to cook. It will generally take about 30 to 45 minutes to really get rolling, so a fire can be started ahead of time, but make sure the wagon is coming with sap before you burn the pans or the syrup in it. Check the level often, especially after switching side with a flow change. The lowest level at the shallowest point should not go below  $\frac{3}{4}$  inch. Normal operation would be about an inch at the shallowest point. Measuring around the pans before the boiling is started will help find this spot. Beware as it could change locations as the frost comes out of the building. Never flood the pans greater than 4 inches deep on the flat when shutting down as this places too much weight in the pans.

When shutting down for the night or at the end of a flow, flood the pans to about 3 inches as this much will evaporate from the heat in the stove. Never leave the valve of the main tank open unless the tank is drained. Always remove the hose on the float valve and drain the line to the tank. This will prevent the line coming in from the tank from freezing up and prevent sap closer to the stove from warming up and turning sour. Sour sap will not cook or filter well nor taste good. For this purpose also make sure there is enough fire left to bring the new added sap to a boil to pasteurize it before cooling down. If only warmed it can sour and spoil the whole pans full. If you are about to start the cooker and the pans are sour, it is better to dump the lot and

start fresh. Even a tanker of fresh hot water flush through the pans would not be wrong to do.

If sap is left in the tanks when shutting down, the valve should be covered to prevent freeze up. This is also important to watch during some cold nights cooking. It has happened that the valve has frozen or ice crystals have stopped the intake screen, causing the flow to cease. Tap the float often if no flow is coming into the pans. If something like this should happen, the first thing to do is bring in a few pails of sap to keep the level up. Do not close the damper as this will cause the most heat on the front pan where the level is usually the shallowest. If the situation can not be changed soon, the fire should be raked out if loaded or pushed back from the fire box doors and leave the doors open allowing a flow of cold air across the fire, cooling the pans. The fastest way is to take a dipper of hot raw sap and pour it onto the valve and pipe coming in. If the flow can be opened or not one should think about shutting down in this situation as the ice crystals are only going to continue to form. If the flow can't be reestablished, some sap should be carried in and the fire should be shoveled out at once. Never throw water into the fire as the fire bricks could explode and the cast iron grate could crack. This would also be done if one ran out of sap without noticing the level in the tanks ahead of time.

To figure on when to shut down, 2 inches in the big round central tank will add one inch in the cooker. So shut down of the fire should come when the tank is about 6 inches.