Small Black Walnut Tapping Business Plan

	Quantity	Rate	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Collection								
Maple tapping drill bit 5/16"	1	$ 19.00	$ 19.00					$ 19.00
Tubing tool	1	$ 285.00	$ 285.00					$ 285.00
Tap puller (or DIY)	1	$ 20.00	$ 20.00					$ 20.00
Sighting level	1	$ 20.00	$ 20.00					$ 20.00
Poly spiles (taps) 5/16" (clear disposable)	50	$ 0.21	$ 10.50	$ 10.50	$ 10.50	$ 10.50	$ 10.50	$ 52.50
Tees (connects droplines to tapline) plug-style	50	$ 0.36	$ 18.00	$ 18.00	$ 18.00	$ 18.00	$ 18.00	$ 90.00
End hooks	3	$ 0.41	$ 1.23	$ 1.23	$ 1.23	$ 1.23	$ 1.23	$ 6.15
Repair connectors	12	$ 0.37	$ 4.44	$ 4.44	$ 4.44	$ 4.44	$ 4.44	$ 22.20
End taps	3	$ 0.48	$ 1.44	$ 1.44	$ 1.44	$ 1.44	$ 1.44	$ 7.20
Vacuum gauge & fittings	1	$ 12.00	$ 12.00					$ 12.00
Tubing 5/16" (all lateral, no mainline)	1000'							
Tubing 5/16" (droplines--2' per tap)	100'							
Tubing 5/16" (return line to bulk tank)	500'							
Tubing 5/16" (air line from compressor)	500'							
Tubing total	2500	$75/500'	$ 375.00		$ 300.00		$ 300.00	$ 975.00
Razor pliers/ tubing snips	1	$ 20.00	$ 20.00					$ 20.00
Air compressor (quiet; 100 gal)	1	$ 180.00	$ 180.00					$ 180.00
Fittings for air line at compressor 5/16"	1	$15/kit	$ 15.00					$ 15.00
Stainless clamps 5/16"	6	$15/pack	$ 15.00					$ 15.00
"Lunchbox Pump" (see separate part list)	1	$ 200.00	$ 200.00					$ 200.00
35 gallon poly bulk tank (food grade)	2	$ 165.00	$ 330.00					$ 330.00
Concentration/Evaporation								
Bucket RO (RB15 Kit; 3 membranes)	1	$ 525.00	$ 525.00					$ 525.00
Water filters	10	$25/10	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 125.00
Membranes	3	$ 65.00				$ 195.00		$ 195.00
RO Preservative	1	$ 6.00	$ 6.00			$ 6.00		$ 12.00
5-gallon buckets (food grade)	3	$ 9.15	$ 27.45					$ 27.45
Fish fryer evaporator 18-quart (or DIY)	1	$ 85.00	$ 85.00					$ 85.00
Propane tank	1	$ 60.00	$ 60.00					$ 60.00
Propane (refills)	1	$ 28.00	$ 28.00	$ 56.00	$ 56.00	$ 56.00	$ 56.00	$ 252.00
Sap refractometer	1	$ 60.00	$ 60.00					$ 60.00
Filtering/Canning								
8-gallon stock pot w/ spigot	1	$ 110.00	$ 110.00					$ 110.00
Colander/frying basket	1	$ 21.25	$ 21.25					$ 21.25
Pre-filter flat cloths	4	$8/4	$ 8.00		$ 8.00		$ 8.00	$ 24.00
Filter flat cloths	1	$ 12.00	$ 12.00		$ 12.00		$ 12.00	$ 36.00
Syrup Hydrometer	1	$ 17.00	$ 17.00					$ 17.00
Syrup Hydrometer cup	1	$ 17.00	$ 17.00					$ 17.00
Small bottles (2oz)	100	$ 0.60	$ 60.00	$ 60.00	$ 60.00	$ 60.00	$ 60.00	$ 300.00
Larger bottles (5oz)	36	$8.40/12	$ 25.20	$ 25.20	$ 25.20	$ 25.20	$ 25.20	$ 126.00
Labels	2	$10/100	$ 20.00		$ 20.00		$ 20.00	$ 60.00
Total Costs			$ 2,633.51	$ 201.81	$ 541.81	$ 402.81	$ 541.81	$ 4,321.75
Gross Sales								
80 2 oz bottles @ $14			$ 1,120.00	$ 1,120.00	$ 1,120.00	$ 1,120.00	$ 1,120.00	$ 5,600.00
28 5 oz bottles @ $35			$ 980.00	$ 980.00	$ 980.00	$ 980.00	$ 980.00	$ 4,900.00
Total Sales			$ 2,100.00	$ 2,100.00	$ 2,100.00	$ 2,100.00	$ 2,100.00	$ 10,500.00
Profits			$ (532.07)	$ 1,899.63	$ 1,559.63	$ 1,698.63	$ 1,559.63	$ 6,185.45
ROI of Year 1 Costs over 5 Years								18%

Calculation of Projected Income for 50 Tap Black Syrup Operation	
Taps	50
Projected gallons sap/tap per season	2.42
Total sap	121
Projected sap content	1.72%
Rule of 86 Projection (gallons of sap per gallon of syrup)	49.711
Estimated gallons of black walnut product (gallons)	2.43407
(ounces)	311.561
Breakage (loss in filtering, etc.)	11.5609
Bottled product	300
80 2 oz bottles	160
28 5 oz bottles	140
80 2 oz bottles @ $14	1120
28 5 oz bottles @ $35	980
Potential Sales	2100

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under agreement number 2023-38640-39573. through the North Central Region SARE program under project number FNC23-1372. USDA is an equal opportunity employer and service provider. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and should not be construed to represent any official USDA or U.S. Government determination or policy.

The Basics of a Black Walnut Syrup Operation

Sugarbush (old-timey name for a stand of trees tapped for sugary sap)
Black walnut syrup comes from black walnut trees. This requires drilling holes in those trees. No research has been conducted on how tapping black walnut trees might impact their value as hardwood lumber. Any timber buyer will certainly lower the bid upon learning the trees were tapped. The return from black walnut syrup will not compare to the value of veneer grade black walnut timber. If you are a tree-hugger and would never willingly cut down your beautiful trees, tap them. If your trees are unsuitable for timber (low branches, not straight, knots and holes), tap them. If there are trees in your timber stand that will eventually be thinned, tap them.

For a small operation, a stand of 50 trees is base level. Hobbyists can use fewer. Trees need only be 8 inches to tap, or even less if they are to be thinned.

Trees must be relatively close together for tubing. Some grade (slope) is necessary for vacuum tubing. Mark the trees you intend to tap. Map your trees (use a laser-finder), plan your tubing, and estimate how much tubing will be necessary to run your lines to each tree. Use a sighting level to determine the grade and order of trees. Also map out tubing from the last tree going to the collection point and tubing going to the air compressor.

Vacuum Tubing
Using buckets may result in an average as little as a half-gallon of sap per tap for the entire season. Vacuum tubing will increase that average to 2.5 gallons per tap (higher vacuum may result in as much as 4 gallons per tap). Anyone intending to make enough black walnut syrup to bottle and sell must use vacuum tubing (or have whole lot of trees and even more time to collect).

The Rusted Flatbed Farm uses 5/16" tubing and taps, all on a single line (no mainline and no laterals) on a the "lunchbox pump." The "lunchbox pump" uses a food grade diaphragm vacuum pump set in a lunchbox cooler filled with water. This imperfect but cost-effective pump is pneumatic (powered by an air compressor), which eliminates the cost of running electricity all the way to the pump. The same tubing is used for sap and air, which is also fairly inexpensive (about $75 for 500'). These are no longer sold, but can be assembled with minimal effort at a cost under $200. A part-list is available upon request (thanks to Doug Mark of Maple Creations for creating it).

Only a fool attempts to hang tubing all by himself. The tubing is run to all of the trees first, using a sighting level to ensure constant change in grade. Everything must flow downhill. It is best to start at the lowest tree where the pump will be located, and then head uphill. Loop the tubing 3-4 times around the first tree and use zip ties to hold them in place. At the last tree up top, use an end hook. A tubing tool is absolutely necessary. Place a vacuum gauge just before the last (highest) tree, leaving room for the dropline.

Once the line is hung, use the tubing tool to cut and place "Tees" for the droplines, and then run the droplines. Run the return line to the bulk collection container (35 gallons at least) and then the air line to the air compressor.

Tapping
The rule of thumb for maples is one tap for trees at 9 inches in diameter and two taps at 18 inches. Because black walnuts grow much faster, tapping can be more aggressive, perhaps two at 16 inches, and three at 24 inches. Buy a tapping bit (they are designed to clear the sawdust from the taphole). Drill into the "ravines" rather than the "ridges." Set your depth at 2 inches. Use poly 5/16" spiles (taps). Stainless steel taps do not seal well in black walnut trees. Gently tap the spile in place until it sounds like it is set (sounds like you are tapping on the tree trunk itself). In central Indiana, tapping should be done in January as soon as temperatures begin to fluctuate between cold nights and warm days.

Vacuum Pump
The cooler must be filled with water. This is to prevent the pump from freezing. If the pump freezes up, disconnect it and bring it inside until it thaws. It should be brought inside during deep freezes (days where the temperature remains below freezing for multiple days). Set the air compressor at a tool pressure of 75 psi. It will make a quick piston sound at first, and then it will slow, letting off a piston sound every thirty seconds or so. If, a fast piston sound happens, there is a major leak in the line. The vacuum gauge will indicate the level of vacuum as well.

Sap Flow
Sap will only flow when the temperature changes between warm (above freezing) days and cold (below freezing) nights, which causes pressure to build in the trunk. When the tree reaches equilibrium, the pressure stops. Sap will come in "runs" of a few days at a time and then stop. The hope is to get several runs during January through as late as early March. If the lines fill with sap and do not appear to move, pull the last (highest tap) and introduce air into the line. This will help clear the line and flush the sap to the collection tank. If your collection tank line is uphill, drain it after each run.

Sap spoils like fruit juice. Put your collection tank in the shade. Process your sap as soon as you can. Taste your sap. If it has a bad flavor, dump it. Consider refrigerating or freezing small runs before or after RO.

Reverse Osmosis (RO) and Boiling
Black walnut sap in the trees at the Rusted Flatbed Farm averages 1.7% sugar content. It must be 66% sugar content to be syrup. Reverse osmosis (RO) is used to concentrate the sap before boiling. RO membranes are so small that only the smallest molecule can pass through it. The pure water (permeate) is removed and the leftover sap (concentrate) gains a higher sugar content. Two runs on a 4-membrane Bucket RO can increase the sap to 8%, which removes 75% of the water in the process. An RO is much cheaper and more efficient than boiling all of it.

Based on 50 taps, and runs averaging about 25 gallons of sap, the concentrate after RO leaves about 5 gallons to boil. This is too little sap for any commercial evaporator. The Rusted Flatbed Farm uses a propane fish fryer. Fill it to about a half inch with sap, set a stock pot with a spigot above the fish fryer and leave a slow drip into the fryer. Check to see that the sap level does not get too low. With a 25-gallon run, it will leave about a gallon left to be finished indoors on a kitchen stove.

Finishing, Filtering and Bottling
Taste your syrup. Once on the kitchen stove, use a hydrometer to check the density. Maple syrup is based on 66-68 brix (66%-68% sugar). This range ensures that the sugar content is high enough not to spoil, and not so high as to turn into rock candy. It will also have the thickness consumers expect from a syrup. Once the syrup reaches the correct range, it must be filtered while still hot. Use a couple pre-filters and cloth filter set on a colander or fry basket. Black walnut syrup has a pectin-like "goop" that forms and clogs the filters. It is harmless and edible—almost like an apple butter, but it cannot be preserved. Pull the pre-filters as they clog.

After filtering, reheat the syrup up to 190 degrees (for glass bottles) before using a funnel to fill bottles. Cap immediately, turn upside down, and lay them laterally on the table. This ensures the hot syrup reaches the entire bottle and disinfects it. Label it,

 Blue Tempest Holdings, LLC bluetempestllc@gmail.com