

## Tapping Survey Results 2014

Thanks to all who answered the survey. I particularly appreciated the extended comments that some of you included. It's more work doing this via email, but more useful than the anonymous "survey monkey" type of data collection—and I've gotten to know many of you through this interchange over the years. I realize that this survey had some abstract questions, such as estimating the amount of sap that you miss due to leaks, or suggesting what would make life easier during tapping—questions that I don't usually hear anyone asking. Next year will be my last survey, as I'm expecting to retire in the end of 2015, and if you have suggestions for questions please let me know.

This year there were about 25 participants using gravity only (most with tubing); everyone else used pumps. The total number of taps represented was 749,000. The breakdown of operations was 41 with less than 1000 taps, 53 with 1000-4000 taps, 32 with 4001-10,000 taps, and 15 with more than 10,000 taps. 48000 taps were added by participants in 2014.

The total number of gallons of syrup made by all participants was 265,043. Vacuum had a strong influence on yield. Using the vacuum level reported by everyone with pumps, the yields in gallons per tap are shown below. Those producers with mixed systems, including significant numbers of both gravity and pumped taps, were not included in this table, nor were the producers who sold their sap.

Method	Buckets	Gravity tubing	Pump	Pump	Pump	Pump
Vacuum level	0	?	<22"	22"-24"	25"-26"	27" and more
# operations	4	21	12	35	33	15
Average gal syrup/tap	0.130	0.126	.231	.307	.365	.410

Twenty five producers made .4 gal/tap or better. All but 5 of these producers were north of Rutland and Washington Counties, VT and Merrimack County, NH.

Most people started tapping in February; however, 57% of the first boils occurred on or after March 29 (in the 2013 survey, 96% of producers had their first boil on or before March 13). Half the producers had their last boil between April 18 and 22 (which was very similar to 2013). Fifteen producers boiled after April 22, almost all from northern counties and/or high elevation, and most of these producers made a relatively high proportion of commercial syrup. Overall, the percentage of commercial syrup reported was 12.4% but more than half of all producers reported making less than 5% commercial syrup (in 2013 the average amount made was 5.2% and almost half of producers reported making no commercial).

## SPOUTS

Most often mentioned "favorite spouts" (in some cases it was pointed out that these weren't really favorites, just the only ones used) were check valve adapter on stubby – 24%, CDL smart spout – 21%, check valve polycarbonate – 15%, other one piece polycarbonate 10%, clear adapter on stubby – 10%,

CDL white spout – 7%. Reasons for their choices included “able to see the sap movement” — polycarbonate spouts of all types, “seals well” — various opinions of which ones do this, and “price” — especially for smart spouts. Favorite spouts of the 25 producers who made .4 gallons of syrup or more were: smart spout—7, check valve with stub spout—5 , CV polycarbonate—4 , other polycarbonate one piece spout—4, clear adapter—3.

More than half of the producers choose a spout in part because it is easy to install, but everyone seemed to have a different view of which spout was easy to install.

Tim Perkins asked me to include the question about a plastic spout that could be reused after being cleaned instead of thrown away yearly; 70% of producers were in favor of this, or might be when the amount of cleaning needed is determined. Results to this issue should come in part from a major cleaning method study now underway at PMRC and Cornell. Some people pointed out that a used spout, even when clean, doesn’t necessarily seal as well as a new spout. One producer kept his older polycarbonate spouts aside and used them after a few years storage, presuming the bacteria were dead; however the spouts turned out to be brittle.

#### DROP LINES

When do most producers intend to replace drop lines? For 26% of producers—in less than every 5 years, 38% at 5 years, 26% when they are at least 7 years old. Producers using check valves were much more likely to say that that they would wait at least 5 years to replace them. Tim Perkins has two articles about this subject on the Proctor Maple Research website, under “recent publications.”

Most people who change spouts cut them off and plug the drop line in the spring. The most interesting reply was from a producer (who had an excellent yield in 2014) who replaces the drop line every year in most of his woods. “When we change drop lines we only change the spout and drop pipe, we reuse the T [the drop line material is 30p, which cuts easily]. We remove the drop lines with lineman’s pliers ground for the purpose and we find very few leaks due to nicks. I feel part of the extra labor involved in that process is offset by the fact that the drop line is the one piece of pipe which is most susceptible to rodent damage and ... the most loaded with bacteria. When we replace them it is seldom we find an area where any liquid remains in the lateral. We remove them in the fall after insect season, leave the T open and replace them in the winter. We do not plug the new spout as I believe the plug on the used T would contaminate the new spout.”

#### WOOD CHIPS

62% of participants do not clean debris from the taphole before setting a new spout. For the many people who still do this — it might be a waste of time. Among the 25 producers who had the best yields in 2014, the vast majority do not clean wood chip from the taphole, including most of those who used check valve spouts. Several people pointed out that using a sharp drill was the solution to having a clean hole.

## TAPPING BELOW THE LATERAL LINE

Tapping below the lateral line is not common, according to this survey, but the majority of producers would do so if this would result in at least 90% of the above-the-lateral yield, as this would open up a new area of clean wood. Many producers asked for a research study related to this issue, and some research on sap yield from tapping in this position took place at the PMRC in 2014 (and will continue in 2015), including using 3/16" drop lines to draw sap up to the lateral.

## MINIMUM TREE DIAMETER

The most popular minimum diameter for tapping is 8", although many producers consider 9" or 10" to be the minimum tappable size. Abby van den Berg says that the chances of 8" trees not accumulating an unacceptable amount of internal damage (leading to brown wood when tapping) is dependent on the trees having a good growth rate (ring width of 1.2 mm or greater) and being in a dominant or co-dominant canopy position. When you start tapping trees this size that are in a suppressed position, or on poorer sites your production is likely to fall off 10 or 20 years down the road. Abby created an interactive model where you can enter variables to see how they would affect the amount of internal staining after a number of years. It can be found on the Proctor website under "Tapping guidelines" – "Interactive tapping zone model."

## 3/16" TUBING

11 producers reported that they had used some 3/16" tubing in 2014, and 36 producers said that they will, or may use it in 2015. Only one person had a complete 3/16 gravity system (not the one written up in the Maple News) and he made .33 gallons syrup/tap, compared to the average for a gravity tubing system of .13 gal/tap in 2014. I have been studying the use of 3/16" tubing for the past 5 years, and all evidence points to it being clearly superior to 5/16" tubing for gravity sap collection. By mid-summer, 2 maple companies (CDL and Dominion and Grimm) will (according to the owners) be carrying 3/16" tubing and a full line of fittings and spouts of their own manufacture, so that installing a 3/16" will be no harder than installing a standard 5/16" system. I do not receive any benefits from the adoption of 3/16" tubing but I would love to see more people using it.

Several producers have reported that they have used some 3/16" tubing in conjunction with a pump, creating a "hybrid" system, where gravity supplements the vacuum from the pump, so that the vacuum at the end of the lateral line is higher than at the mainline. While I have only just started studying this, (I found that I could increase the vacuum from a "sap puller" by 5" Hg by using 3/16" lateral lines on a mild slope) other producers have reported good results doing this with more powerful pumps. I urge everyone with a pump that delivers 25" or less to the mainline to try this experiment: set up a 3/16" lateral line with around 10 taps, and put a vacuum gauge on the end of the line. It doesn't take much of a slope to gain a few more inches of vacuum. The smaller diameter line can handle very high flow rates. A study of sap yield from 3/16" tubing connected to a Busch pump will be initiated at Proctor in 2015.

A third possible application of 3/16" tubing is in its use as a drop line when tapping below the lateral. Results of testing this application during the 2014 season were quite promising, with the sap yields

below the lateral equal to the yields from above the lateral. This will be studied more thoroughly in 2015.

#### LEAKS:

When producers are first checking their vacuum in the spring, by far the most common source of leaks is animal damage. When these are fixed, loose spouts and bad/hollow trees become the source of most leaks. Tubing to fitting leaks were rarely reported; the exceptions were a few producers who pulled rather than cut last year's un-barbed spouts off the drop line, and found that this often resulted in a poor seal between the drop and the new spout.

Estimating how much sap was missed due to vacuum leaks provided some interesting results. I expected that the people who had the best yields would say that their losses due to vacuum leaks were minimal, but apparently there was no relationship between the amount of syrup most people made, and the amount that they thought they should have made.

Estimated amount of sap missed:	1-2%	5%	10%	15+%
Average 2014 syrup yield in gallons/tap	.33	.31	.33	.36

Vacuum leaks were identified as the greatest source of missed production by the vast majority of producers. Problems with releasers, pumps and pans were much less important for most people, although "wind" was mentioned by several producers as their number one issue.

The average yield for producers who said they checked their woods for leaks every day was .36 gal/tap; for producers who checked the woods every week it was .25 gal/tap.

What would make your life easier when tapping? The most repeated answer, by far, was "make repairs earlier," especially before the deep snow. Some other responses signaled the need for some good inventions: lighter weight drills and other equipment, spouts that were easier to attach to tubing, "a dispenser for spouts to give one at a time and keep them clean when wearing gloves and a tool to quickly push new spouts onto tubing," "marks indicating old tapholes," "warm, nimble gloves" a drill that also set the spout, tubing that animals don't chew, better repair tape.

Seven producers indicated that they might tap birches in the future. No one admitted to doing it in 2014.

#### 2015 MAPLE CONFERENCE SCHEDULE

For those of you who like to plan early, here are the dates for the January meetings: January 3 Bellows Falls, VT, January 10 Verona, NY and Connecticut, January 17 Middlebury, VT and Massachusetts, January 24 Hyde Park, VT. If you have suggestions for topics for Bellows Falls and Hyde Park please send them to me.

## SOME RESEARCH SUGGESTIONS

(Most of these were mentioned by several people)

Comparison of wood, pellets, oil and electricity for evaporator fuel

How to process sap in warm weather

Effective pan cleaning methods

Better ways to deal with niter

Sap filtration methods

Defoamer for organic syrup

How to process ropy syrup

## SOME RESEARCH IN PROGRESS AND/OR SOON TO BE REPORTED ON

Tapping depth vs. yield; tapping below the lateral line; tubing cleaning methods; long term effects of high vacuum on tree growth.

A couple people asked about tapping cut-off saplings. You need to talk to Tim Perkins or Abby van den Berg – I have no connection to that project.