

## TAPPING SURVEY 2009: RESULTS

Here are results from my 5<sup>th</sup> annual tapping survey. This electronic end-of-season survey is conducted in order for us to share knowledge about sap collecting procedures used by sugarmakers, as well as some other operational information, and relate this knowledge to syrup yield. While these data come primarily from Vermont maple producers, the survey is open to any producer willing to share his or her information. All replies are confidential and never linked to an individual's name. If you wish to participate in future surveys, please send a valid email address to [timothy.wilmot@uvm.edu](mailto:timothy.wilmot@uvm.edu) and remember to update any changed address by April 2010.

This year's data come from 163 producers, about 90% from Vermont, the rest from surrounding states. In Vermont, all counties except Essex (1 producer) and Bennington (4 producers) were represented by at least 8 producers.

Total taps included this year were 627,414, of which 569,270 were on vacuum, 41,062 were on gravity tubing, and 17,082 were on buckets.

There were 6 producers with over 500 buckets and 28 with over 500 taps on gravity tubing. With vacuum operations, 44 had less than 1500 taps, 38 had 1500-3999 taps, and 38 had 4000 or more taps. There were 27 small operations with less than 500 total taps.

Syrup Yield—if you had a majority of either buckets, gravity tubing, or vacuum, I counted you in that category; several people had mixed systems. These numbers include operations from all participants in Vermont and other states.

Buckets	10 producers	average yield .169 gallons/tap
Gravity tubing	29 producers	average yield .164 gal/tap
Vacuum—divided into groups based on your vacuum level at the pump, if it was reported		
Vac. less than 17.5"	6 producers	average yield .228 gal/tap
Vac. 17.5"-19.5"	12 producers	average yield .275 gal/tap
Vac. 20"-22.5"	33 producers	average yield .324 gal/tap
Vac. 23"-25"	46 producers	average yield .377 gal/tap
Vac. greater than 25"	10 producers	average yield .347 gal/tap

Why did the yield seemingly drop off with the highest vacuum level? There is a lot of information that I did not or could not collect, such as the amount of time you spent in the woods chasing leaks, or how many taps per lateral, or whether you had a wet/dry system, or the number of days that the sap ran for you, etc—so the vacuum level, although important, is just one part of the equation. The number of producers reporting vacuum over 25" was small, so the average yield is less reliable than with lower vacuum levels.

Geography—there were some areas that had less than ideal weather, in particular Bennington and Windham counties where most people finished around the end of March. Some people in the central counties also had too much snow. Excluding Bennington and Windham, the average reported yield for producers in Vermont only with 23" or more vacuum (43 producers) was .391 gal/tap.

Sap sugar content: average reported by all was 2.01 brix—55 producers reported lower than average sap sweetness, 63 said sugar content was normal, and 18 said it was above average. There was no geographic trend in relation to the reported sugar content.

Tapping guidelines reported:

Only 1 tap per trees of all sizes	18 producers
No more than 2 taps per tree	74 producers

No more than 3 taps per tree	59 producers
Up to 4 taps per tree	2 producers

Smallest tree normally tapped:

Less than 8" diameter	12 producers
8"	39 producers
9"	35 producers
10"	41 producers
11" or more	26 producers

Smallest tree with two taps:

16" diameter or less	62 producers
17"-18"	34 producers
20" or more	32 producers

Most of the people tapping 8" or smaller trees are using vacuum. For producers using 23" of vacuum or more, two taps in trees 16" or smaller resulted in considerably lower gal/tap than the yield for those using 2 taps in trees 18" or greater or 1 tap only. Other than that, there were no clear trends. It would be instructive to see how much syrup per acre people are making.

Reverse Osmosis (RO)

RO was used by 81 producers, including 2 on buckets only, and 5 on gravity tubing only.

The smallest operation using RO had 685 taps, and 19 of 45 producers with less than 2000 taps used RO.

Number of Taps — average concentration:

Less than 2000	8.89 brix
2000-3999	8.57 brix
4000 or more	10.63 brix

Tubing washing:

Air and water	43 producers
Water only	28 producers
Bleach and water	11 producers
Tubing cleaner	11 producers
Peroxide, alcohol	2 producers
Do not wash	48 producers

Many in the do not wash category report that they pull spouts under vacuum. A few wash their mainlines with water.

Spouts and tubing:

57 producers reported using all new tips this year—either new spouts or new extensions. We still get many questions about washing extensions, which we feel is a bad idea, as any used plastic, being porous, can hide bacteria that will plug up tapholes in warm weather. We have research to back this. While it seems wasteful to throw away an extension every year (the agency of Ag is working on recycling—stay tuned), at 20 cents each, you could pay for a new extension by making around 1/3 gallon more sap per taphole, which is likely. Several people commented that their new spouts or extensions ran much better than their or neighbor's older spouts, especially towards the end of the season.

Some people do not like extensions at all due to increased places for leaks. Single piece straight through spouts (clear, stainless, etc.) are growing in popularity.

In this survey, among vacuum users, there was no good overall trend in terms of yield for people who had tips that were new vs. used, again because many other factors are involved in determining sap yield.

Research, as done at the Proctor Center, is the best way to determine the effects on yield of new vs. used

spouts because other influences, such as vacuum level and weather, are constant for all the tests. Also in this survey many people reported that some percentage of spouts were new, some were several years old—as was true for droplines and laterals, so it was hard to calculate the effects with any precision. Very few producers are still using 7/16” spouts with tubing, either vacuum or gravity. About half of the bucket users have 5/16” spouts.

Characteristics of high yield operations:

I separated out 38 producers who made .4 gal/tap or more, looking for trends. Most were from Addison, Franklin, Lamoille and Orleans counties. Average sugar content was 1.92 brix. All were on vacuum—only 3 had vacuum at the pump less than 22”. 19 used all new tips this year, and only 5 used tips that were 3 or more years old. 4 used stainless spouts for most taps (of the remaining 123 producers in this survey reporting spout type, only 4 others used stainless). There were no other obvious trends.

Vacuum pump problems and comments:

Several producers mentioned dissatisfaction with their dairy pumps. Many commented how much they liked their ring pump—either water or oil cooled, although keeping the water cool for good vacuum was an issue for some. Almost no one said they really like their oil flood pump, although there were few problems mentioned. Several producers stated that the new variable speed drive on their pump motor allowed them to closely monitor problems in the woods, as the speed or amperage of the motor would go up whenever there was a significant leak.

Things that you wish you had done differently:

Over half of the comments related to vacuum—get it, improve it, spend more time in the woods looking for leaks, etc. Other comments related to the need to replace old tubing, or reduce the number of taps per lateral line. 9 of the 76 comments mentioned “should have tapped earlier” and these comments came from counties all over the state.

Research Ideas—these are always helpful—here are some of them:

Improved saddles, more testing of check-valves, straight vs. 90 degree spouts, compare RO concentrate to raw sap, performance of different membranes, reasonably priced small vacuum systems, reducing/dealing with niter, stainless vs. plastic tanks, syrup layering, long-term effects on tree health of high yield tapping. We are or will be working on several of these topics.

Some comments:

“Broke the vacuum pump and could only get 18” out of it. Keep a spare on hand.”

“We are thinking of installing a second wet line so that we could clean one without stopping production.”

“Make sure you get a lease in writing, no matter how friendly the people may seem!”

“ This year the majority of our sap runs were overnight and had I shut my systems down as many in my area do I would not have made nearly as much syrup.”

“ A fellow sugarmaker with the same number of taps, elevation and vacuum 5 miles away made 2/3 more per tap than me, and the main difference is he had twice as much mainline and no more than 4 taps per lateral, and short laterals. I’ll be making changes this year towards that goal.”

“Aren’t we lucky to be in this industry!”

Best regards,

Tim