

## Tapping Survey Results 2010

Thank you to all who participated in this survey; this year more than 210 people sent in data about their season. The total number of taps of all participants was over 780,000, and as usual there was a good mixture of different size operations. 36 were under 500 taps, and 52 were over 4000 taps, including 14 over 10,000. 11 people had at least 500 buckets and 16 had at least 1000 taps on gravity tubing. Most participants were from Vermont, but several were from New Hampshire, with a few from New York and Connecticut.

As has already been widely discussed, there was a huge gap between the sap yield of producers on vacuum and gravity. This year 8 producers using almost exclusively buckets averaged .12 gallons syrup per tap, 47 using tubing without vacuum averaged .10 gal/tap. Last year these groups averaged .17 and .16 gal/tap respectively. This year 119 producers using vacuum for all or almost all taps averaged .33 gal/tap. The remaining operations consisted of mixed systems using both gravity and vacuum, and most had yields somewhere between the averages for gravity and vacuum.

Producers on vacuum using 0 to 2% new plastic spouts or adaptors of any design averaged .268 gal/tap.

Producers on vacuum using 90-100% new plastic spouts or adaptors of any design averaged .353 gal/tap.

Not all of this difference is attributable to new spouts, as some producers who change spouts yearly also have the highest vacuum and the most efficient tubing systems.

Producers on vacuum with 4000 or more taps averaged .362 gal/tap; producers on vacuum with 900-1970 taps averaged .308 gal/tap.

Characteristics of vacuum producers who made more than .4 gal/tap: 90% used new spouts or adaptors on most taps, 39% had new droplines on at least half their taps; 39% used check valves on at least half their taps, 90% had a wet line/dry line conducting system; 84% used liquid ring pumps.

Characteristics of vacuum producers who made less than .3 gal/tap: 50% used new spouts or adaptors on most taps, 36% had new droplines on at least half their taps; 29% used check valves on at least half their taps, 60% had a wet line/dry line conducting system; 62% used liquid ring pumps.

Check valve adaptors were used by 73 producers, including 27 producers who used them on all their taps. There were many comments about them, some of which can be found at the end of this document. I did not ask producers what they liked about check valves, only what if any problems people had with them, so most of the comments were negative. 17 producers, including producers using many thousands of them, reported no problems, while many others reported problems with a few, to many of these adaptors. The most common problems reported were breakage, with check balls falling out and in some cases blocking fittings further down the lateral line, and loosening between the adaptor and tree or stubby and adaptor. Many people felt that the manufacturer needed to make the adaptor more durable. Some people felt that they helped production, some felt that they hurt production, and most did not know how they affected production. A common theme was that their use involved more time in tapping, tightening, and washing, and it was not clear yet to many if the benefits outweighed the extra time needed for dealing with them. This year, with the abrupt ending to the season caused by hot weather, was not a good one for testing the effectiveness of an adaptor designed to extend the season.

There were some problems reported with various other spouts, but no consistent theme to these problems. The few people who use all stainless spouts seemed very happy with them.

Sap sugar content: 50% of producers said it was less sweet than normal, 8% said it was more sweet than normal; the rest said it was normal. Many producers commented that sweetness started out normal and then became abnormally low—this was probably the result of the long period between freezes; after a freeze sap sugar often rises, but in 2010 trees had little chance to “rest.”

Percentage of dark syrup made: producers whose last boil was between 17-30 March averaged 14.2% dark syrup, producers whose last boil was between 31 March and 3 April averaged 11.7% dark syrup and producers whose last boil was between 4-17 April also averaged 11.7% dark syrup.

Red maple: 58% of producers tapped at least a few reds, and 23 producers had at least a third of their taps on red maples. In all, almost 1 out of 6 of the 780,000 taps of participants was in a red maple. Producers with no red maple taps had an average of 9.6% of their syrup darker than table grade and 11% of these producers had their last boil after April 4<sup>th</sup>. Producers with at least a third red maple taps had an average of 11.7% syrup darker than table grade and 13% of these producers had their last boil after April 4<sup>th</sup>.

Niter: 21% said it was less than normal, 37% said it was heavier than normal, and the rest said it was normal. 49% of producers who concentrated with RO reported high niter, while only 28% of producers not using RO reported high niter. Producers with more red maples were somewhat more likely to report high niter.

Reverse osmosis was used by 98 producers, including 71% of all vacuum producers. 5 producers had less than 1000 taps. The most taps that anyone had without using an RO was 3600. 39 producers concentrated to 8% or less; 36 concentrated between 8.5% and 12%, and the remaining 23 producers concentrated between 13.5% and 20%. Producers who made a lot of syrup tended to concentrate more. Thus, of over 260,000 gallons of syrup made by all participants in this survey, 66% was made from sap concentrated to 10% or more, and 53% was made from sap concentrated to 13.5% or more.

Several producers reported metabolism; however, I suspect some of what was reported as metabolism was instead buddy, as people mentioned making it at the end of the season. There were no cases of metabolized syrup among the many entries in the Vermont Maple Festival syrup contest (but there were some buddy syrups). Some producers did not understand the question. Metabolism in syrup is an unpleasant woody or earthy smell and taste, and can appear in syrup at any time. Any more than a hint of metabolism should cause the syrup to be downgraded to commercial. It is not clear what causes metabolism. Two recent articles on the Proctor Maple Research Center website ([www. UVM/~pmrc](http://www.UVM/~pmrc)) provide a detailed explanation and a method of restoring metabolized syrup.

Almost 30% of the producers in this survey reported the presence of invasive plants in their sugarbush. Among the most common of these pests were barberry, honeysuckle and buckthorn, and close to half of these respondents reported that the infestation was moderate to heavy. With increasing yearly temperatures these infestations will likely get much worse for many sugarmakers; in Vermont they are currently a problem primarily in the southern counties and along the eastern and western borders of the state. In many other maple producing states, woodland invasive plants are much more pervasive.

By far the most common response to the question, “what if anything do you wish you had done differently?” was “tapped earlier,” written by 57 producers. Several other comments related to improving the vacuum system, in one way or another. Seventeen sugarmakers who did not use vacuum in 2010 said that they may, or will use it in 2011.

There were many research suggestions; two of the most frequently made involved studying the long term effect of high vacuum sap extraction on the tree, and washing tubing (should it be done, and how). Other topics included studying the number of taps per acre rather than per tree, comparison of syrup made from raw sap vs. RO sap, pan cleaning techniques, spout comparisons, better long-term weather forecasts, and many others. All of your suggestions will be passed on to Tim Perkins, and some of these ideas, including the long-term effects of high vacuum, are already the subjects of new research at the Proctor Center.

Some Comments:

I think the situation (of invasive plants) is getting worse or perhaps I am getting more aware of the problem.

We have been tapping red maple for a long time and are finding that the overall sweetness has not suffered much.

We found that injecting air into mainlines by opening and closing valves on the end of lines helped to flush sap, preventing sap from setting in lines. This seemed to improve sap quality during the two warm spells we had.

Sugaring is not the same as it was in the 50's to 70's. snow goes sooner, makes me believe in climate change.

What has made it so hard to get sap to flow naturally, the way it used to 30 or 40 years ago?

Wish we were younger, would have been easier tapping.

Wish I had walked the lines. Because I had all new tubing I wasn't as concerned but still found 3 spouts popped off and several squirrel chews when pulling spouts.

I got the best vacuum ever by getting a cold water source to cool my vacuum pump

Some check valve comments below:

CVs all loosened up and had to be driven over and still came apart very easily. Wish I had not used cvs, they need to be redesigned. Found way too many balls stuck in saddles. Loss of sap on lines plugged by balls cost more than the advantage over conventional tips. disadvantages outweigh advantages at this time.

If put together too tight I can't get them (cv and stubby) apart, put together too soft they don't stay together.

If cvs are used every year do we need to keep changing the drops?

We broke fewer as we became more careful. Cvs stayed tight in the tree with fewer that needed to be tightened than old tree savers, maybe because it never really go cold during the season.

Because of the short season it was impossible for me to evaluate the effectiveness of the cv over standard 5/16 spouts.

Concept (of check valve spouts) is great, manufacturing and quality control was very poor.

Split open, came apart, clogged during season.

I did see a bunch of slime in the cv balls but I can't believe the trees were running so late--you'r gonna get slime that late (hot).