

## Results from the 2006 tapping survey

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The results described here are from 133 sugarmakers, 95% of them Vermonters, who answered an email survey that I sent out this spring. Questions included number of taps using buckets and tubing with and without vacuum, timing of tapping, spout size, spout manufacturer and spout age, vacuum level at the pump and at the taphole, tubing cleaning method, syrup yield in 2006 and average yield, and the amount of Forest Tent Caterpillar defoliation in 2005. This survey will be repeated in 2007. Next spring I would be happy to include any sugarmaker who wants to participate; all I need is an email address.

The data provide an interesting glimpse into this year's maple production, but certainly don't answer all our questions about what works best in terms of sap collection. Not all questions on the survey were filled in by all respondents, in addition, quite a bit of information is just not available. For example, many people collected sap using a combination of 2 or 3 methods, so that yields do not reflect just the sap from, for example, tubing without vacuum using large spouts, but a combination of that, plus some buckets, plus some collection by vacuum. Nevertheless, there were some clear trends. Another confounding factor this year was the variable weather across the Vermont. Some producers may have state-of-the-art collection systems, but did not collect as much as producers in other parts of the state with older equipment, because the weather was far from uniform across the state, or even across a single town.

The total number of taps in 2006 put out by survey respondents was 356,263; of this, 296,430, or 83% were on vacuum; 39,194 or 11% were on tubing without vacuum, and 20,639 or 6% were buckets. There were 15 producers on vacuum with > 5000 taps, 14 producers using tubing without vacuum with > 1000 taps, and 4 producers with > 1000 buckets.

The 2006 sap yield, which was reported from all but 5 producers, ranged from .05 gallons of syrup per tap to .63 gal/tap. The average was .217 in 2006. The "normal" average reported for all years (89 people answered this one) was .270, and for these same 89 the yield in 2006 was .229, so this was a poor year on the whole for those responding. 20 people had a better than average year in 2006, and 19 made less than 2/3 of their average.

Putting together information from this and last year's surveys, it appears that producers who collect sap using tubing without vacuum have the lowest yields; this year's average for 18 people using exclusively tubing without vacuum was .133 gal/tap, and their reported average for all years is only a little above this.

For 71 producers collecting most or all sap with vacuum the average yield for 2006 was .260 gallons/tap.

In terms of size of operation, when total taps was less than 1000 the average yield was .171 gallons of syrup/tap; for 1000-4999 taps average yield was .240 gal/tap; for 5000 or more, the average was .293 gal/tap

**When tapped:**

38% of producers started tapping in February, with Feb 1 the earliest reported date; 32% tapped between March 1 and March 5; and the latest reported date to start tapping was March 22. Time to finish tapping was anywhere from one day to 6 weeks, so start day may be a little misleading; although it apparently took most people 4 days or less to tap. 31 people thought they tapped too late, including people who tapped the first week of February. My guess is that if you tapped right after the end of a good thaw, and we had many in January and February, then you felt you tapped late, especially if the weather stayed cold for the following week or two. Seven people though they tapped too early.

Of 12 producers who tapped by Feb 15 and had most or all taps on vacuum, the average yield in 2006 was .315 gal/tap

Of 15 of the same who tapped March 6 or later, the average yield was .264

Of 7 gravity collectors (buckets and/or tubing) who tapped before Feb 18, the average yield was .174 gal/tap.

Of 22 gravity collectors tapped after March 7, average yield was .150 gal/tap

Here are some brief results from a study of timing of tapping that I conducted at the Proctor Center this spring. Three groups of trees were tapped in either January, February, or March, and sap was collected under high vacuum into chambers that isolated the flow from each tree. The group that yielded the most sugar (volume x sweetness) this year were the trees tapped on January 20<sup>th</sup>; while the trees tapped February 24<sup>th</sup> and March 22<sup>nd</sup> had about the same yield (about 17% less than the January tapped trees). Slowing of flow from older tapholes did not become significant until the warm weather at the end of March. After this, the fresh tapholes from March 22<sup>nd</sup> greatly outperformed most of the older tapholes during the ideal sugaring weather of early April. I hesitate to say that this shows that tapping early will always be a good idea. This is obviously a study that will need to be performed for many years, as the weather this year was anything but typical.

**Forest Tent Caterpillar:**

40 respondents who tapped in 2006 reported some FTC defoliation, plus 4 more who did not tap at all in 2006 due to severe defoliation. Of the 40, 12 reduced the number of taps in 2006 because of the defoliation.

In a study I conducted with 3 Rutland County sugarmakers who had some trees defoliated by FTC in 2005 and some not, the defoliated trees were slightly less sweet, on average, than the non-defoliated trees. This does not answer questions about subsequent health of the defoliated and then tapped trees.

**Spout size, age and type:**

101 producers used only small (5/16" or smaller) spouts in their tubing, or in both tubing and buckets. Only 4 people used 7/16" spouts with vacuum.

Of 55 people collecting some sap in buckets, 24 use small spouts.

Of 63 people collecting some sap using tubing without vacuum, 38 used only small spouts.

Tubing without vacuum producers: In terms of yield, sugarmakers using large spouts averaged 16% less sap than those using small spouts. I suspect the difference is explained by people with small spouts having modernized their tubing system more recently than people with large spouts.

Brands reported: IPL and Leader were the most common.

31 people used some form of adaptor. Vacuum producers using adaptors on all or most vacuum spouts averaged .276/tap;

Vacuum producers without adaptors averaged .252 gallons/tap

For people reporting some dissatisfaction with their spout and or adaptor, the major reason for complaint was vacuum leaks between the tree and the spout; also some small spouts that deteriorate in the sunlight.

Age of spout: For vacuum users, with spouts or adaptors that were new in 2004 or later, yield was .284 gal/tap; for spouts or adaptors used since 2003 or earlier, yield was .230 gal/tap.

#### **Vacuum levels:**

The average was 19.6” mercury, with only 16 out of 83 people reporting less than 18”, and 50 reporting 20” or more. At the tree, for those who reported anything, 43% reported 18” or better.

In terms of yield, for everyone with vacuum between 10 and 15”, the average yield was .200 gal/tap; for everyone who had between 16 and 21” the average yield was .254 gal/tap, and for everyone with 22” greater at the pump, the average yield was .286 gal/tap.

#### **How we wash tubing:**

42 producers reported pressure washing with air and water, 3 include some bleach in one step of their pressure wash, 2 include some acid, 14 use the pan cleaner and vacuum method, 5 pull spouts under vacuum, 12 use some chlorine, 8 do not wash—some of these people report letting the first sap go on the ground. Most of the remaining producers report using just water applied either by pressure, gravity or vacuum as a rinse; one answered how do you wash tubing—“poorly.” I suspect he is not alone, at least in some years.

#### **What people would do differently, if given a chance:**

Other than tapping earlier, as mentioned above, many people wished they had more vacuum, or some vacuum at least, or had fixed leaks in their vacuum system. New spouts were another common wish.

#### **Some comments that came with the survey:**

“We had replaced about 850 droplines with blue semi-rigid this year but I was quite disappointed at cleanup time as many new drops had considerable mold spots in them which would not come out. I’m seriously wondering if we need to suck a Clorox solution through the drops to help clean out mold. Washing effectively removes the freshly developed slimy material in the lines but doesn’t do much for the mold that attaches itself to tubing walls. Replacement of tubing is too expensive to consider on a routine basis.”

“We washed the week we quit this year. In previous years we had to wait a week or two and I think we did a better job this year.”

“I will change the first foot of the lateral lines to Four-seasons tubing which will help in vacuum leaks at the entrance setup [connection to multi-fitting]. We currently use 30p.”

Once again it proved that tapping early with new/clean spouts and high (+20”) vacuum had the best yield”

“When the 70 degree weather hit I thought we were doomed. But thankfully Mother Nature came around and we had a chance to give everything a good cleaning at the tail end of that really warm spell and then things came back pretty nice.”

And not related to sap collecting, but interesting anyway:

“One thing that I would have done had I known we’d have two idle weeks after the first boiling would be to boil down the sweet—sitting that long in the syrup pan, it seems to have dropped a grade and tasted not quite as good.”