For the past five years I have conducted a survey of sugarmakers in order to better understand the use of certain maple production methods and technologies. This “Vermont tapping survey,” which included 163 sugarmakers in 2009, is sent in May to anyone with a maple operation of any size whose email address I know. Recently I have added sugarmakers from surrounding states who have asked to be included. The questions and the participants have varied somewhat from year to year. Many questions cover subjects not discussed in the National Agricultural Statistics Service survey, and often the data are quite interesting. Several trends in maple production have emerged and are summarized below.

Over the past five years, the number of taps on gravity represented by all the survey participants has steadily declined. This may or may not represent an actual decline in gravity collection, but it points to the very small percentage of syrup actually made by sugarmakers using either buckets or gravity tubing. In 2009, out of 163 participants, 35 sugarmakers had at least 500 taps on buckets and/or tubing without vacuum and many more had lesser numbers; however, these numbers represented only about 9% of the total number of taps placed by all participants. Additionally, it is clear that the average tap on gravity does not result in nearly the amount of syrup that a tap on vacuum does. For example, in 2009 (a good year for most producers) the average amount of syrup per tap made using bucket collection was .17 gallons per tap; using gravity tubing it was .16 gallons per tap; while the average amount made using vacuum ranged from .23 gallons per tap for low vacuum (less than 17 inches mercury at the pump) to .37 gallons per tap for high vacuum collection (at least 23 inches mercury).

These data point to another trend—the increasing level of vacuum used for sap collection as it becomes clear that higher vacuum leads to higher sap yields. In 2006, the average vacuum level (at the pump) was reported to be 19.6 inches; in 2007 it was 20.7”, in 2008 it was 22.2” and in 2009 it was 22.9”. Some of the factors responsible for producers using higher vacuum include the availability of better pumps, as well as the publication of research showing improved sap yields with increasing vacuum (for example see http://www.uvm.edu/~pmrc/vacsap.pdf) without negative effects such as chemical changes in the sap or more extensive wood damage brought on by high vacuum. In almost every year that I surveyed, there was a strong relationship between the amount of vacuum used and the amount of syrup made per tap. 2008 was an exception, as very deep snow reduced yields in the colder parts of the state, and some producers with buckets made considerably more syrup than producers with modern tubing systems and high vacuum.

Spout use has also evolved over the past 5 years. In 2005 and 2006, about two thirds of the producers with gravity tubing reported using the small, or “health” spouts. By 2009, this number had increased to over 90%. Almost all producers use small spouts with vacuum, and about half of all bucket spouts in 2009 were 5/16” diameter. About 10-15% of producers with tubing use some or all stainless steel spouts, which are all 5/16” in diameter or smaller. Spout adaptors were used by about 25% of producers with vacuum in 2005; in 2009 almost 50% used adaptors, as did 22% of producers with gravity tubing. Many producers report using the adaptor for only a single year (this is how they are intended to be used). In 2009, almost half of the producers using vacuum put a new spout or spout adaptor in the taphole. Better sap yields have been consistently reported by producers using newer spouts. For example, in 2007, vacuum producers using spouts or adaptors that were no more than 2 years old averaged .3 gallons
syrup/tap, while vacuum producers using spouts at least 3 years old averaged .25 gallons syrup/tap. As far as a relationship between tubing age and sap yield, most producers report replacing their tubing and droplines in stages, so that their tubing system consists of plastic of various ages, and it is difficult to compare yield with the amount of time the tubing has been in use.

Tubing cleaning methods have also changed since I began this survey. In 2005, the majority of producers with vacuum tubing cleaned with air and water. While this method is still popular, an ever increasing group reports not washing at all, only pulling the spout while the vacuum pump is on. In 2005 and 2006, many producers cleaned tubing by injecting a water and phosphoric acid solution into the spout. By 2009, a much smaller proportion of producers reported using this method. A chlorine and water solution is used by many producers to clean gravity tubing, but very few vacuum producers use chlorine.

Sap sweetness has certainly varied over the past 5 years, but no real trend is apparent. In 2007, 75% of producers reported lower than average sap sugar; in 2008, 72% said it was higher than normal, and in 2009 the most consistent answer was that sweetness was about normal. “Normal” turns out to be a relative term, as some people who reported sap at 2.5% to 2.8% brix said this was below normal, and others with concentrations as low as 1.8% said this was normal.

Energy efficiency has become an important topic for sugarmakers in the past few years. In 2008, I asked producers with reverse osmosis (RO) about their level of sap concentration; the average was 9.5% brix, which was about 1 point higher the same people concentrated to in the previous year, when fuel was cheaper. RO is used by an increasing amount of smaller producers in Vermont; in the latest survey, 20 out of 45 producers with between 635 and 1900 taps used RO. During the year of high energy prices (2008) I asked questions about fuel consumption, and found that producers using RO averaged .84 gallons of oil per gallon of syrup made, vs. 3.4 gallons of oil/gallon of syrup without RO. Wood use averaged 96 gallons of syrup/cord with RO and 23 gallons/cord without RO.

Finally, I always ask producers what, if anything, they wish they had done differently during the current season. By far the most common answers have been “get a vacuum system,” “improve the vacuum system” and “spend more time in the woods.” Another common response is they wish they had “tapped earlier” which is written much more often than “tapped later.” Some of the other common responses include “add more taps,” “get better tubing,” and “use different spouts.”

Results from 2009 can be found on the Proctor Maple Research Center website at http://www.uvm.edu/~pmrc/tapping%20survey%202008.pdf. If you would like to participate in the 2010 tapping survey, please be sure that I have a valid email address next spring. You can find my contact information on the Proctor Maple Research Website at http://www.uvm.edu/~pmrc/.