

ARE USED MAPLE SPOUTS AND NEW SPOUTS EQUAL? *Reprinted from Farming, the Journal of Northeast Agriculture. January, 2011*

Many sugarmakers hate to throw anything away, reasoning, why get rid of a perfectly good piece of plastic when it still looks almost new? Over the past decade, researchers have been telling sugarmakers that “perfectly good” parts of their sap collecting system may not perform as well as they once did. During the 2008 and 2009 sugaring seasons I conducted some experiments with maple spouts at the University of Vermont Proctor Maple Research Center to see if I could measure differences in sap yield under vacuum from new vs. used spouts. The results were interesting.

All sap in this study was collected in “vacuum chambers,” transparent tubes, 6” in diameter and 30” long, which were attached to trees in the study, with one chamber for each taphole. These chambers capture sap from individual tapholes under vacuum, allowing the volume to be measured. In these experiments the sap from 30 tapholes was collected in separate chambers and measured each day throughout the season.

Rather than run through a whole range of materials, I tested only two spouts: IPL 19/64” plastic spouts, and IPL 19/64” stainless spouts (this is not meant to be an endorsement of these or any other products). I compared new plastic spouts with spouts that had been used for 6 years, and annually washed in place with air and water. I also compared new stainless spouts with spouts that were used for 3 years and washed in the woods with “pan cleaner”, and other used stainless spouts that had been soaked in old sap for a month prior to my placing them in tapholes. The droplines in all cases were new, and everything else about the tests of these spouts, including the size of trees and the aspect of the tapholes, was the same.

Here are the results, but consider the trends only—don’t take these numbers as absolute. For the majority of the season, there was virtually no difference in sap yield between the new and any of the used spouts. During the last 10 days of the 2008 season at the Proctor Center, the air temperature exceeded 60 degrees F on several occasions—conditions highly favorable to the growth of microorganisms. Only during this period was there a marked difference between the yields from new vs. used materials. Over these 10 days, an average of 22% of the total sap for the season was collected using the new spouts; 18% of the total for the season was collected from the pan cleaner washed stainless spouts, 14% of the total for the season was collected from the used plastic spouts, and 4% of the total for the season was collected from the spouts previously soaked in old sap. In other words, the tapholes with new spouts yielded somewhere around 5-15% more sap for the season than the tapholes with used spouts.

As an addition to these findings, I tested new vs. used stub spouts in 2009. While many producers replace the adaptor that fits onto the stub spout every year, the stub is replaced much less often. Lapierre stubs that were 5 years old and had never been washed were fitted with new Lapierre adaptors and compared to new Lapierre stubs and adaptors. The 2009 sap season in Vermont also featured late season temperatures that were quite high. Similar to 2008, differences in sap yields from these stub/adaptor combinations were not evident until temperatures warmed. Although there was considerable variation among trees with the same treatment, less sap was collected using the older stub spouts.

I also tested the effect of raising a loop of dropline in an arc above the spout so that the sap pooled against the spout before it flowed away; this exaggerated the decline in sap yield during the period of warm weather. Producers considering tapping below the lateral line, an idea with some proponents who wish to

exploit more of the tapping band of their trees, should be aware that this will increase contact between the sap and a contaminated spout, and will likely increase the effect of residual microorganisms on the spout.

These experiments were each confined to a single season, and each comparison was repeated in only 5-6 trees, so the yields reported here are going to vary at other sites and in other years. Used spouts had been cleaned in the woods only; some producers take their spouts or adaptors home and soak them in bleach or clean them by other methods. It is possible that these methods are more effective than cleaning materials in place. Tossing out a spout or adaptor rather than making it work for several years seems wasteful to many people; however, producers should always weigh the cost of a new spout or adaptor with the value of even a very small amount of additional sap that might be gained by using new materials.