Measuring sap flow

Issue is not only important to producers but researchers as well

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Running a successful sugar operation is complex to manage the site. Proper installation and maintenance of tubing, vacuum pumps and releases are all important to ensuring maximum sap production. Keeping track of the amount of sap being collected is also important for maintaining high yields and minimizing losses. Problems that cause vacuum pump failures are very good at not showing different differences in how sap flows into the releases. Air passing through männistors, souring flow and partially frozen sap can all help identify trouble in the tubing system; however accurately measuring the amount of daily sap flow can be somewhat problematic. The current methods of standard sap tank readers monthly determining sap volume estimates difficult. In addition, the highly dynamic nature of individual sap runs (short period of high flow followed by long periods of low flow) in a partially filled pipe poses problems for standard flow meters. This issue of measurement is not only important to producers but to researchers who must measure sap volumes with precision to detect any differences between experimental treatments.

Over the past several decades we have used several different methods to measure sap volume. With a bucket it is fairly simple...when the system is under vacuum it becomes more challenging. At the University of Vermont, Poulin Maple Research Centre, we employ a combination of simple measuring canisters mounted on mechanical vacuum releases to measure sap production. We are frequently asked by maple producers for details on how we accomplish this and how they might set up something similar in their operations.

The counter shown in Figure 1 is one method that we have employed for many years. It uses a magnetic window/door switch (like that used in security systems) connected to a small LCD display. The display and the wired magnetic

Figure 1: Magnetic tally counter attached to small mechanical reaser.

Figure 2: Line graph depicting cumulative maple sap production over two separate seasons.