

Maple Syrup Makers Tap Wireless Monitoring Technology

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MILTON, Vt. (AP) — [Maple syrup production](#) [1] has come a long way from metal buckets hung on trees, but even high-tech operations have had to rely on old-fashioned foot patrols to fix a common problem — leaks.

The tubes that draw sap from trees straight to sugar houses often get pulled down or bent by falling limbs or chewed by critters, meaning sugar-makers spend hours and sometimes days stomping through snowy woods to find and fix problems — a big time-waster in a sugaring season that lasts just a few weeks.

But now sugar-makers are harnessing new technology to keep the precious sap flowing.

Meadowbrook Maple Syrup in January installed a monitoring system that is already paying off. Designed to help mid-to-large scale syrup producers keep an electronic eye their sap vacuum lines, the Tap Track system consists of solar battery-powered radio units strapped to trees, with each unit monitoring the pressure on a half-dozen lines. The data is transmitted to a computer or smartphone, where it shows up as a map with green dots indicating lines with good sap flow and red dots indicating leaks. Users can even get text messages alerting them to problems.

"I think it's the thing of the future. I really do," owner Donnie Richards said.

In the past, Richards and his crew would have to walk the woods of Milton listening and looking for leaks, which was time-consuming.

"And if you didn't find the leak that day, you didn't get sap off that part of the woods all day long," he said.

Now he uses his iPhone to check the system and can immediately see a leak and when it is repaired.

Richards' operation includes about 5,000 taps, with about 18 miles of tubing spread out over more than 100 acres. The new system costs \$1 to \$2 per tap, but inventor Jason Gagne said the return on investment can be seen in one season. He said the test site of 20,000 taps in Ontario resulted in a more than 5 percent increase in sap collection, or an extra \$15,000.

Gagne, who used to spend days on end patrolling his own sugar bush in Swanton, came up with the idea several years ago, teaming up with Canadian sugar-maker Doug Thompson to develop the product.

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The University of Vermont's Proctor Maple Research Center is using a similar remote monitoring system for the first time this season, as the technology becomes more commercially available. Smartrek, produced by a Quebec-based company, also monitors sap lines for leaks and provides the information immediately on a smartphone or tablet.

Nationally, maple syrup production totaled 3.25 million gallons last year. Vermont led with 1.3 million gallons, followed by New York, Maine, Wisconsin, Ohio, Michigan, Pennsylvania, New Hampshire, Massachusetts and Connecticut. Each of those gallons of syrup required sugar-makers to collect 40 gallons of sap.

It takes warm days and cold nights for sap to flow, so the conditions are just right for syrup-making for only about 4 to 6 weeks. And cold weather has already pushed back Vermont's season this year. But Proctor researchers expect the new system to make their operation more efficient and productive. It will also give sugar-makers, who are prone to staying up late to boil sap down to syrup, a few extra hours of sleep, said Brian Stowe, Proctor's sugaring operations manager.

"We find that a lot of sugar-makers get sleep deprived during the season, this again they can take a quick look from their house and then they can go to bed and get some good sleep and not have to worry," Stowe said.

The ideal system would have a sensor at the end of each of the main lines. But that can be expensive for some sugar-makers — about \$200 per Smartrek vacuum sensor and \$400 for a tank level sensor — so some sugar-makers may start with a smaller number depending on what they want to monitor.

"Whether it's mine or Tap Track or any of the other systems, the technology is fantastic," said Eric Sorkin, of Thunder Basin Maple Works in Cambridge, who was so impressed with Smartrek that he became a distributor.

In the past, Sorkin said, the only way to increase production was to make sure sap is flowing in the system, and that meant lots of man-hours checking each line.

"With these remote monitoring systems, we can effectively lower our labor costs and increase our production," he said.

Gagne described an incident last year when his system showed a leak where a porcupine had cut the line. Just as workers had repaired the break, Tap Track showed another leak.

"You could follow the porcupine prints right to the next line where he'd cut it," he said. "Otherwise, it would have been a few more days before we found those two lines."

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