## Sap sugar within, between seasons at UVM PMRC

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UNDERHILL CTR., Vt.—Maple producers generally recognize that sap sugar content is quite dynamic.

Changes in the amount of sugar in maple sap vary within a sap run, from day to day, throughout the season, and from year to year.

The probable causes for this are many, and many of the factors influencing why sap sugar changes are only partially understood, however some patterns are consistent.

At the UVM Proctor Maple Research Center (PMRC), sap sugar has been measured consistently for each sap season over many decades.

The bush is a mixture of about 2/3 sugar maple and 1/3 red maple.

For each sap run resulting in enough sap to process into syrup, the sugar content is measured using a hand-held digital refractometer for each of the two separate collection sites daily.

Oftentimes several measurements are taken within a day. The 2019 and 2020 sap flow seasons illustrate several interesting patterns that producers may recognize (Figure 1).

The 2019 season started somewhat later than normal at the UVM PMRC location in Underhill, Vermont.

The first appreciable sap run was in mid-March. Discreet and distinct sap runs occurred about every week until early-April, at which point sap runs happened almost daily until the season ended later than is normal, a bit after mid-April.

Sap sugar content followed the typical pattern, starting a bit low, then rising somewhat from the beginning until about one-third to one-half into the season, at which point it reached a peak of 2.6°Brix, followed by a slow and steady drop to a low of 1.7°Brix at season end.

Small transitory upticks in sugar can be observed following freezes.

Overall sap sugar averaged across the 2019 season was 2.1°Brix.

This is just slightly above the normal season average of  $2.05^{\circ}$ Brix for this site.

The 2020 season started in late-February with a solid two-day sap flow, interrupted afterwards by about a week of cold weather with no sap.

Sap flows began again in early-March, with intermittent cold weather and flow stoppages of 2-5 days throughout the month before ending in early-April, almost two weeks earlier than in 2019.

Sap sugar again peaked early before showing a fairly steady decline throughout the remainder of the season. Sap sugar was noticeably low for the entire 2020 season, averaging only 1.8°Brix.

Peak sap sugar barely exceeded the long-term average, and the season ended with sugar levels less than 1.5°Brix.

Although sap sugar was higher than normal in 2019 and lower than normal in 2020, both seasons were productive due to high sap volumes with an overall yield of 7.5 lbs of syrup per tap in 2020 compared to 7.2 lbs of syrup per tap in 2019.

The 2004-2020 average yield at UVM PMRC is 6.6 lbs/tap.



Timothy D. Perkins, Ph.D., Research Professor & Director, University of Vermont Proctor Maple Research Center at the Sumner Hill Williams sugarhouse in Underhill Center, Vt. on Nov. 5.



**FIGURE 1.** Patterns of sap sugar content at the UVM Proctor Maple Research Center in 2019 and 2020. Each bar represents the average sap sugar (°Brix) for all sap collected during each flow period. The dashed black line represents the average sap sugar at this site from 2004-2020. The dashed red or blue lines show the moving 3-day average trend in sap sugar concentration.

