



PROCTOR PAGE

News from the University of Vermont Proctor Maple Research Center



Spout colors can affect sap temp at the taphole

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UNDERHILL CTR., — We reported in a previous article (Does Color Matter?, The Maple News June/July 2018) that color influences the degree of solar warming of spouts during sunny, windless days and can impact sap yields.

Black spouts in particular are highly subject to warming under these conditions, which can be good in cold years or in cold sugarbushes, but can have strong negative impacts on sap yield during hot, sunny years due to hastening of microbial growth.

In general, a small amount of warming might be desirable, but too much is decidedly not a good thing.

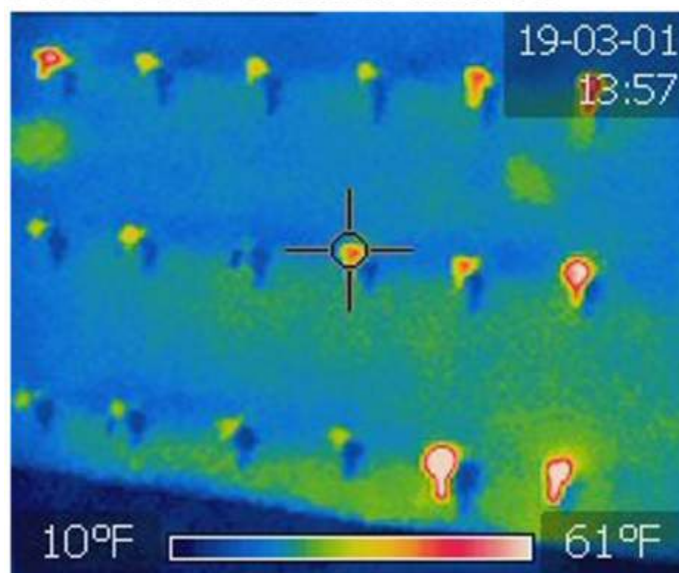
Given the increased availability of a wide variety of spout types and tints, we wanted to reinforce and expand on this earlier work.

Side-by-side images of a selection of maple spouts shown in false color infrared (IR) and actual color are displayed in the photo accompanying this article.

Spouts were mounted on a foam core board and exposed to sunlight on a cold, windless day at the UVM Proctor Maple Research Center in Underhill, Vermont, and allowed to come to thermal equilibrium.

Ambient air temperature was around

False Color Thermal Infrared



Actual Color

Smoke Grey (Clear)	Light Red (Clear)	Med Pink (Clear)	Light Pink (Clear)	Med Orange (Solid)	Med Green (Solid)
Light Blue (Clear)	Light Blue (Clear)	Clear (Clear)	Light Blue (Solid)	Med Blue (Clear)	Dark Blue (Solid)
Clear (Clear)	Clear (Clear)	White (Solid)	White (Solid)	Black (Clear)	Black (Solid)

Photos: Georgia Bosley, Research Technician, UVM Proctor Maple Res Ctr, Underhill, Vermont

FALSE COLOR THERMAL IMAGE (left) and actual color photo (right) of the same selection of spouts. Captions overlain on the actual color image state the color of spout and whether it is a solid color (typically nylon) or polycarbonate (clear) spout with or without tint.

25-28°F.

Apparent temperature of spouts is shown on the scale at the bottom of the IR image, indicating the amount of solar heating of spouts.

In general, darker-color spouts heat up under these conditions significantly more than lighter-color spouts.

Black spouts warmed to 61°F under these conditions, approximately 33-35°F above that of air temperature.

While this might enhance thawing in the vicinity of the taphole, such a high

degree of heating can have serious implications for taphole “drying” and for sap quality in the tubing system if prolonged or frequent.

Solid white spouts warm up only a few degrees above ambient.

Solid color spouts (other than white) typically warm up more than clear (polycarbonate) or tinted (polycarbonate) translucent spouts.

The amount of warming of tinted spouts is strongly related to the color density of the tint (observe the Smoke Grey

tinted spout in the upper left of the IR image), with lighter tints warming less than darker tints.

Unfortunately, it is not possible to predict temperatures across a full season, thus making the choice of spout color problematic.

If a sugarbush tends to be quite cold, darker colored spouts might help.

However, in most situations clear or lightly colored or lightly tinted spouts probably make more sense.