WHICH SIDE OF THE TREE SHOULD YOU TAP? *Reprinted from Farming, Journal of Northeast Agriculture October, 2009*

One of the questions we are sometimes asked is "which side of the tree is best for tapping?" Beginning sugarmakers often put all their tapholes on one side of the tree—usually the south side, with the result that the trees soon look like they received shotgun blasts on that side. Eventually there is no more space for a new taphole. There are also people with their own theories, such as that the taphole should be under a large branch, or over a large root. While there may be advantages to the south side or one particular side in some years, overall it is healthiest for the tree and most productive for sap collection to spread the tapholes on all sides of the trunk.

Researchers setting up a sugarbush experiment will often place all the tapholes in the test trees on the same aspect. This is not because there is an ideal side, but because this eliminates one source of variation which might otherwise confuse the results of an experiment comparing, for example, the sap yield from large or small spouts. In fact, in many years there is a difference in the sap yield from different sides of the tree, both in terms of the timing of sap flow, and the overall yield. I annually measure sap pressure and flow on an hourly basis from both the north and south sides of large trees at the Proctor Maple Research Center, and often the two sides respond to weather conditions quite differently. The south side of the tree, receiving direct sun, is sometimes the only side of the tree to thaw, and this can occur when the air temperature is well below freezing. Although most of the tree may be frozen solid, the heat of the sun on the bark of the trunk and branches is enough to set the sap flow mechanism in motion on that side. On days when the temperature rises from well below to above freezing, and then plummets again at night, the south facing tapholes may run for many more hours than the north side. In the latter part of the season, the situation is often reversed—the south side shuts down, sometimes weeks before the north side. This is caused by the differential heating of the wood on sunny days, which can result in high bacteria populations that will plug the sap conducting vessels in south facing tapholes.

In my own experiments, the sum of all the sap collected from the north facing tapholes and the south facing tapholes has been about even, but the individual years have varied tremendously. In years with many short runs and a quick end to the season, the south side has been more productive, while in years with long sap seasons and intermittent spells of very warm weather the north side has often been much more productive. In 2003, 2007 and 2009, late March was actually warmer than the first half of April at the Proctor Center, and March temperatures in the 60's caused south facing tapholes to plug up. Just one example—on March 27, 2007, when the wood on the south side of the tree at a depth of about 1 inch reached 71 degrees, the wood on the north side at an equivalent depth was 42 degrees, and the center of the tree was 32 degrees. After the warm spells, seasonable weather in April resulted in continued flow for two to three weeks longer on the north side, resulting in total sap yields from the north tapholes that were 89% (2003) 70% (2007) and 24% (2009) greater than sap yields from south facing tapholes. In contrast, the years 1999-2001 and 2005-06 were all relatively short seasons in Underhill and the south facing tapholes yielded more sap than those on the north side. Although I have not collected experimental data from east and west facing tapholes, these sides should be just as productive as north and south, perhaps with different timing of sap flow depending on the weather.

While the data described above come mostly from gravity sap collection, I have recorded similar differences in recent years with high vacuum sap collection. When using more than one tap on a tree,

particularly with vacuum, it is beneficial to keep the tapholes as far apart as is reasonable, using long droplines, because this increases the area of wood that the sap is drawn from. Spreading the tapholes out around the bole ensures the best spacing of the holes in the cambium and the areas of internal blockage resulting from wound. This is one more way that maple producers can ensure the long-term sustainability of their maple stand for continued sap collection.