



TAPPING GUIDELINES

...An Update

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The use of permanent tubing systems can result in problems directly affecting tree health. When trees are overtapped or improperly tapped, the result is serious stress on trees which contributes to tree dieback.

One problem is caused by the use of droplines that are too short on permanently-installed systems. This results in a clustering of tapholes because taphole location is improperly determined by “bringing the taps to the spouts.”

Power tappers allow faster tapping and can lead to less time spent looking at each tree and taphole before moving along to the next tree. Many sugarmakers hire untrained help to tap. This often results in poor taphole location.

Maintaining tree health and productivity depends on careful tree management, the proper number of taps per tree, and distributing these taps over as large an area of healthy wood as possible. Distributing these tapping injuries properly will keep them separated from each other by larger areas of healthy white wood. Thus, the tree will be better able to continue (normal sap flow) functioning. Dropline location and length should be adequate to reach these properly-located tapholes.

For tubing systems, recommended minimum dropline length for permanent system is 30 inches. Generous dropline length will allow vertical staggering as well as horizontal offsetting of new tapholes. These long droplines can be kept from sagging below the lateral lines by tying them back when tapping closer to the trees. Be prepared to move laterals or change droplines, or a combination of both to make the best use of healthy sapwood.

Place new taps at least six inches to one side and one foot above or below any old taps which are still open. This is important!

The tapping guideline below is based on:

- Tree growth rate as determined by measuring the thickness of growth rings in fractions of an inch. Use an increment borer on a few trees of each size class in each soil type. Only bore one inch deep to minimize tree injury. Checking stumps or stems of trees cut during thinnings can also indicate general growth patterns.
- Size of the tapping band is determined by measuring its net usable circumference. **Tapping Band** refers to the live area of a maple trunk which contains the compartmentalized tapholes or sections that have not been tapped. Both are available for tapping. It is vitally important that taps be properly distributed over as large an area (both vertical and horizontal) as possible.
- The measured usable circumference can then be used to figure adjusted tree diameter.

Each tree should be closely inspected, and adjusted tree diameter determined by measurement. For example, a cluster of open tapholes, wound, or canker should not be considered part of the tapping band. The unusable circumference should include this cluster or injuries and an additional six inches on each side of the cluster (minimum horizontal offset from old open taps).

This tapping guideline is unique because it requires a minimum rate of tree growth which is necessary to seal over tapholes and produce new wood for future taps. It also separates the usable circumference of the tree from the unusable circumference and relates this circumference to adjusted diameter.

Recommended numbers of taps by usable circumference:

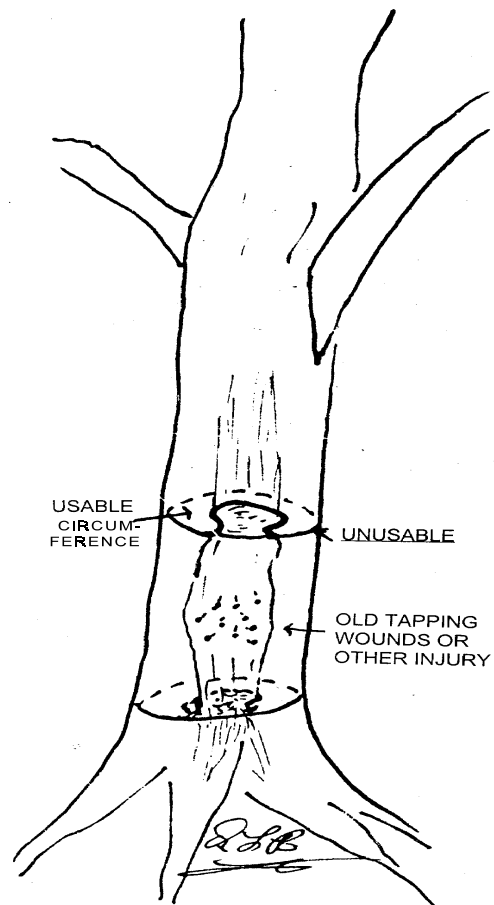
- 1 tap = 12" to 18" diameter for a healthy tree or...usable circumference of 36" to 54".
 - Outside growth rings are at least 1/8 inch thick.
 - If growth rings are less than 1/8 inch thick for more than 2 years, see your forester and give the tree a rest from tapping until growth rates improve.
- 2 taps = 18"+ diameter for a healthy tree or...usable circumference of 54" and over. Not over 2 taps for any size tree.
 - If growth rings are less than 1/8 inch thick for more than 2 years reduce number of taps or see your forester and give the tree a rest from tapping until growth rates improve.
 - Always spread taps over as large an area as possible.
 - Place new taps at least six inches to one side and one foot above or below any old taps which are still open.

Why the “adjusted” diameter is so important

Example:

A 20 inch diameter tree has had two taps per year for five years, clustered on one face. A number of these tapholes are still open. Sap flow has been seriously reduced in this face which exceeds 10 inches in width. These taphole injuries may combine, compounding injuries and speeding up decay.

This 20 inch diameter tree has a total circumference of 60 inches. Reduce this total circumference by subtracting the section of the overtapped face plus the necessary horizontal offset of 6 inches on each side of this face. This results in a usable circumference of 38 inches ($60 - (10 + 6 + 6) = 38$). Since diameter is roughly 1/3 of the circumference, the adjusted usable diameter of this tree is now about 13 inches ($38/3$). At best, a 13 inch diameter tree can handle one tap per year. Continued use of two taps on this tree may speed up injury, dieback, and lead to premature death.



Yearly inspection of the tapping band will determine when and if an acceptable shell of new wood covers the taphole cluster, making the tree usable for more than one tap per year.

Reminders:

- Take time to determine the proper number of taps per tree.
- Place new taps at least six inches to one side and at least one foot above or below any old taps which are still open.

Tree Health and Management:

Sugarmakers are well aware of the fact that trees respond to environment, tree health, and management.

Some aspects of a tree's environment may be beyond landowner control. However, many significant factors are controllable through good management. There is no substitute for proper management. Proper management is not only within individual control, it should be considered an individual obligation. Proper management results in healthier trees and increased efficiency and income.

Important considerations of proper management include recognizing the land's capabilities and limitations, proper thinning and orderly tree replacement, proper protection from destructive agents such as insects and grazing, and proper tapping procedures.

The advent of tubing systems has had a significant impact on site selection, thinning, and tapping procedures. For example, prior to tubing, swampy areas were not tapped because the sap could not be gathered. Observation indicates these areas do not usually produce healthy trees or profitable volumes of sweet sap. The use of tubing allows easy gathering from these areas, but doesn't mean that tapping these trees is recommended if tree health will be compromised.

Destructive agents such as insects and grazing livestock injure and weaken trees, reducing their capacity to produce tappable wood and high volumes of sweet sap. We can deal with many of these agents but some we can't. Livestock should be excluded and insects should be controlled where possible. For instance, well-managed sugarbushes are less favored by sugar maple borer. Healthy trees also recover better from defoliations.

Early, careful, and regular thinning is absolutely essential to the process of establishing and maintaining a healthy, productive sugarbush. Those working in your sugarbush should be highly skilled in "directional felling" and in the careful removal of the trees once felled. Pre-planning of harvest trails and an ability to fell and remove trees, without damage to those left to grow, is critical.

Too much thinning, no thinning, or poorly-timed thinning all contribute to poor tree health. For example, stands weakened by defoliation should be allowed to recover before thinning. Thinning too soon after heavy defoliation can result in heavy tree dieback. Excessive soil disturbance and root damage also cause tree health problems. Older trees or trees growing in shallow and/or wet soils may require gentler thinning to avoid dieback or windthrow. The result of not thinning dense stands is crowded trees, which will be seriously weakened as a

result of competition. These trees will not grow sufficient sapwood for future tapping.

Because tubing systems are considered a pain to take down for thinning, many stands are not thinned at all. This is a serious mistake.

Other stands are over-thinned to reduce the “pain” of handling tubing too often. Often, frequent, light thinning is best in well-managed sugarbushes. This requires frequent handling of tubing but the results are worth it. When you replace tubing, be sure to schedule a thinning while the lines are down. Those who prefer fewer “entries” by equipment in their sugarbush might prefer a heavier thinning at longer intervals. They should consider checking with the State Forestry Protection Division to discuss defoliation predictions for the next year before engaging in heavy thinning activities.

There are a number of qualified state and private foresters who can assist you in managing your sugarbush. Contact your local county forester at your local UVM Extension or Agency of Natural Resources office to get started.

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TM, November 2002

More Thoughts on Tree Management...

Select new sites for sugaring carefully and avoid tapping non-productive areas within the bush (i.e., swampy, shallow, or excessively drained areas).

Use a refractometer before thinning to determine variation in sugar content in the stand. If you are uncomfortable using this procedure, ask your County Forester or Consulting Forester for help. Sometimes trees can be sweeter in response to stresses caused by insects, logging, grazing, or other causes. Such trees are usually a poor choice to keep as they may not live as long and they may produce sap (from wet wood, etc.) that can adversely affect product quality.

Avoid felling and skidding damage when thinning. When thinning, use crown release to make more open space for the branches of crop trees to expand. Imagine the crown of the tree as a circle having four sides. After thinning, two or three of these sides should have room to expand. Again, a forester can help by marking.

A mixture of species is much healthier, and with log values increasing, can be a very sound financial investment. Remember to leave some trees for the birds. While in the area, birds will do away with huge numbers of harmful insects which could otherwise damage healthy trees.

If possible, rest trees for one year following a thinning. This helps them adjust to the sudden change in their environment.

Livestock and sugar woods do not make a healthy combination. Protect the bush from grazing which results in soil compaction, root damage, and loss of valuable regeneration.

When tapping, use only SHARP BITS — dull bits tear wood. This results in less sap yield and problems with sap quality as the season progresses. Either sharpen bits properly or throw them away and use new ones.

Carefully search the tapping band for good locations for new taps.

Do not drill holes any deeper than necessary. One and one half (1½) inches is enough — regardless of kind of spout used. The newer small spouts can be only ¾" deep with no loss of production.

Check the color of wood shavings when tapping. Look for bright, white, healthy, shavings. This is the best assurance we have that the new taphole will be productive. After the spout is installed, it is very difficult to tell if the taphole is productive (as compared to buckets which can be easily checked). The writer has checked tubing installations in which 15% of the taps were non-productive. Tapping into decayed or diseased wood results in poor quality of sap and allows the decay to spread into new live wood.

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