

## 8.3 MAPLE SUGARING

### BACKGROUND

**Sap production in a sugarbush relies on developing and maintaining large, spreading crowns in maple trees.**

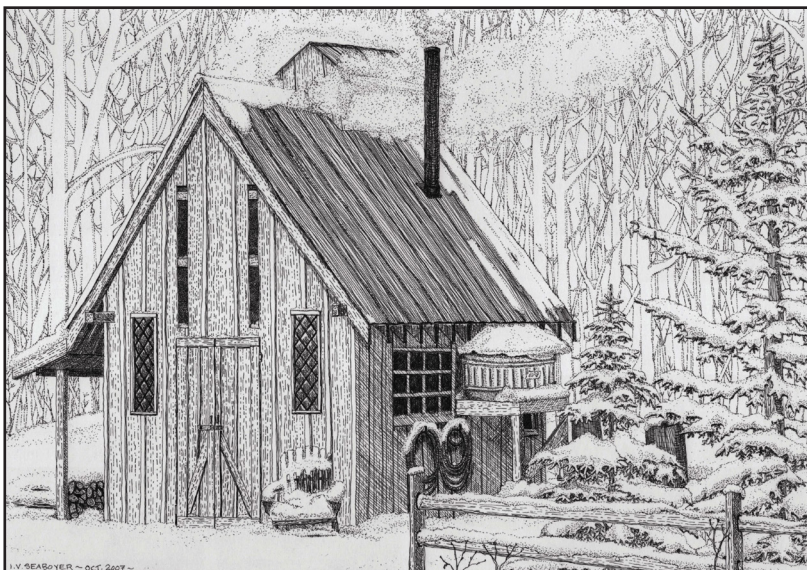
A sugarbush, or sugar orchard, is a stand of maple trees tapped for maple syrup. Sugarbushes can become overcrowded and tree vigor and sap production can decline. Maple trees rarely develop large, spreading crowns naturally in the competitive forest setting. To achieve such crowns, the tops of maples must be released through thinnings and improvement cuts—preferably throughout all stages of development. Often sap-producing maples growing in a mixed forest compete with other maples and with other kinds of trees. Overcrowding and competition for light and other resources negatively affect sugar content and sap volume and reduce stand vigor.

### OBJECTIVE

**Manage existing maples in sugarbushes to have large, spreading crowns. Regenerate maples to replace declining or overmature maples. Tap maple trees so tree health and vigor won't be adversely affected, and so the market value of the upper logs won't be compromised.**

### CONSIDERATIONS

- Sugar maples produce the sweetest and the most sap, but red maples can be tapped.
- Red maple “buds out” earlier than sugar maple. Sap from “budded out” trees produces an off-flavor. Bucket-collection systems are better adapted to mixed red and sugar maple bushes than tubing-collection systems. When red maple buds swell, operators can stop collecting from those buckets.
- Maples often occur in mixed stands with other trees suitable for timber production, wildlife habitat, or aesthetics (but not maple sap production).
- Silvicultural actions taken to develop large, full crowns in maples will most likely result in an open park-like appearance to the stand.
- Tree vigor and production will decline in older maples. Establishing a new crop of trees through regeneration harvests and release of advanced regeneration sustains sap production.



**Old Pound Road Sugarhouse, Antrim, New Hampshire**

### 8.3: Maple Sugaring

- Sugarbushes can either be even-aged or uneven-aged. Each stand structure requires its own silvicultural prescription to maintain vigor and health and to regenerate a new cohort of maple trees.
- Some sugarbushes are declining because they (1) have been tapped for many years, (2) aren't on soils ideal for optimal maple development, and (3) have root and stem damage from logging, or yearly sap collecting and sugarbush maintenance. Stand age and the effects of tapping, combined with off-site development, all can lead to stand decline.
- While coniferous cover around the sugarbush edge may help minimize wind damage, conifers may create habitat for unwanted wildlife such as porcupines and squirrels that are apt to gnaw on tubing.
- Sugarbush health can be affected by several factors out of landowner control. Ice storms, insect outbreaks, drought, acid deposition, and other stressors affect sap production and sugar content. Sugarbushes in good health and on better sites will better tolerate these uncontrollable forces.
- Tapping injures the tree. The tree's ability to recover from this injury, and the overall health and productivity of the sugarbush, are closely related to tree health and environmental stresses.
- When tapped correctly, healthy, vigorous trees will respond to tapping by compartmentalizing the wound and closing the tap hole within one to three years. Trees in poor health and those under stress during the growing season won't respond as quickly as healthier individuals. This slow response to injuries may result in a greater area of decay and potentially a decline in health, production and quality.
- Traditional tapping guidelines allowed for tapping smaller trees and using more taps. Newer, more conservative tapping guidelines minimize the impact of tapping while maintaining or in some cases even increasing sap production.
- Trees harvested for firewood for maple syrup production are exempt from the yield (timber) tax (RSA 79).

### RECOMMENDED PRACTICES

- ✓ Manage for a diversity of species, but select for healthy maples. An abundance of species and age classes will meet other forest stewardship objectives and create a resilient, diverse forest.
- ✓ Select maple crop trees for large crowns, sugar content, vigor, and form. Timber quality may not be a priority, but a maple with good form will tolerate the stresses of wind, snow and ice better than one with decay, cavities and poor branching patterns. To promote large, full crowns, release the crowns of the crop trees by removing undesirable trees whose tops are touching the tops of the maple crop trees.
- ✓ Make improvement cuts and thinnings gradually to promote crown development. Excessively releasing maples too quickly may overexpose them and cause dieback or mortality. Thinnings should follow silvicultural guidelines based on stand density and tree and crown size.
- ✓ Time thinnings to coincide with tubing-system replacements.
- ✓ Especially in long-established sugarbushes, regenerate when appropriate. Encourage new trees to grow to production size through releasing and thinning.
- ✓ Follow best management practices (BMPs) to maintain water and soil quality, nutrients, wildlife habitat, and forest health.
- ✓ Follow these tapping guidelines for tree health:
  - Tap only trees 12 inches diameter at breast height (DBH) and larger.

- Place one tap hole in trees 12 to 18 inches DBH.
  - Place two tap holes in trees greater than 18 inches DBH.
  - Place no more than two tap holes per tree.
  - Drill tap holes at a slight upward angle to prevent sap pooling.
  - Use the smaller-diameter “health spouts” (5/16- or 19/64-inch spouts). Health spouts are preferred, but the 7/16 inch spouts are still acceptable and common when using buckets to collect sap.
  - Avoid tapping when the wood is frozen.
  - Drive spouts with care to avoid splitting the bark and wood.
  - For 7/16 inch spouts, place the tap hole no more than 2½ inches deep and for the smaller-diameter spouts, no more than 1½ inches deep.
  - Tap only white, clean wood. To avoid areas of discoloration and decay, don’t place new tap holes within 6 inches horizontally and at least 2 feet directly above or below old tap holes.
  - Make sure “drops” (tubing attached directly to the spout) are long enough so tap holes can be placed on all sides of the tree. This avoids clustering of tap holes.
  - Don’t retap existing holes in any given year to expose new wood, or drill new holes to prolong the sap run.
  - Don’t use a tap-hole sanitizing agent.
  - Remove spouts from tap holes immediately after the season.
- ✓ Attach tubing systems including mainlines to trees with protectors such as wooden blocks to protect the tree from stem injury or girdling. Avoid driving nails, lags, screw eyes, or other hardware into the trees.
  - ✓ Prevent damage to tree trunks and roots, as well as to roads and trails, from sap-gathering or maintenance vehicles, such as tractors, trucks, sleds or trailers. Set collection containers so they are easily accessible.
  - ✓ Avoid tapping trees that may yield high quality logs, if growing sugar maple sawlogs is an objective.
  - ✓ Allow other native tree species to grow, especially if they aren’t competing with maples and don’t attract nuisance wildlife that cause damage to tap lines. Other species can serve as good anchors for tubing mainlines.

## CROSS REFERENCES

2.2 Forest Structure; 2.3 Regeneration Methods; 2.4 Managing for High-Value Trees; 5.1 Insects and Diseases; 5.3 Ice and Wind Damage; 5.4 Logging Damage.

## ADDITIONAL INFORMATION

Heiligmann, R.B., M.R. Koelling, T.D. Perkins. 2006. *North American Maple Syrup Producers Manual: Second Edition*. Ohio State University Extension, Columbus, Ohio. 329 p.

Houston, D. R., D. Allen, and D. Lachance. 1990. *Sugarbush management: a guide to maintaining tree health*. USDA For. Serv. Gen. Tech. Rep. NE-129. 55 p.

RSA 79. *Forest Conservation and Taxation*. <http://www.gencourt.state.nh.us/rsa/html/v/79/79-mrg.htm> Accessed May 27, 2010.