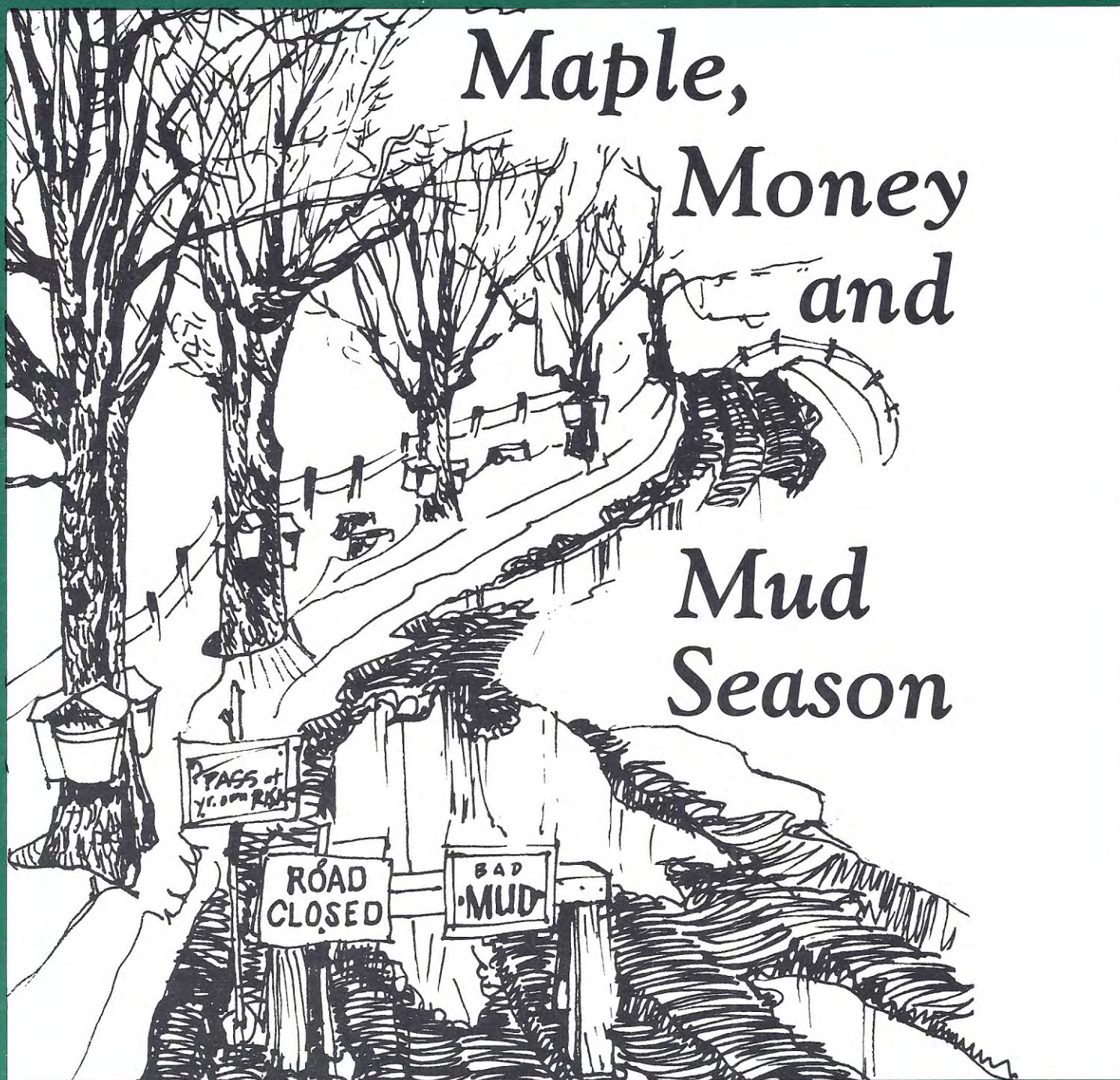


# the Forest Owner



## Maple, Money and Mud Season

# The Forest Owner

A PUBLICATION OF THE NEW YORK FOREST OWNERS ASSOCIATION

## Forestry Day

On April 27, 1985, the Westchester County Department of Parks, Recreation and Conservation will conduct a Forestry and Conservation Day at Ward Pound Ridge Reservation in Cross River, New York. The event will be a series of forestry programs all combined in a one day celebration. For information call 914-285-2651.

— Ted Kozlowski  
Forester

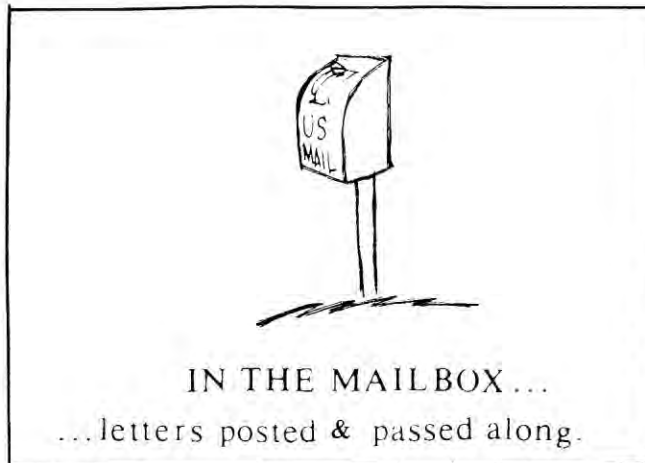
## New Look

Just received the January/February issue of The Forest Owner. Nice job! It looks great. The new products section should be quite useful to the readers. Keep up the good work. It can only help the association grow.

— George Mitchell  
Northeastern Loggers' Association

## Suggestions

Here are some topics for your consideration: The Empire Forest System and its insurance program; soil erosion on logging roads and



skid trails; fast-grown hardwood plantations in New York; and the pros and cons of establishing wood-using plants that depend on low grade wood chips.

— David W. Taber  
Renewable Resources  
Extension Associate

## Thanks for the tour

About the NYFOA tour this past August ... our impression of the United Kingdom? The most

delightful rural countryside we've ever seen. Our travelling companions were congenial, a few we knew from previous trips. Much of the time we hiked or drove through forests and Christmas tree farms. We were invited into historic private castles owned by the same family for two and three hundred years, cold and grand, more like museums than homes.

— Philip and Elisabeth Jones  
Shelton, Connecticut

## The Cover

It's been said that New York has five seasons: spring, summer, fall, winter, and mud. This month's illustration comes to us from a tongue-in-cheek calendar produced by Vermont Castings wood stove company, Randolph, Vermont, and is reproduced with their permission.

It may be mud season, but it's also maple time. This month we feature several items about opportunities for forest owners in the maple business. Look inside the back cover for "Ask a forester" to read maple specialist Lew Staats' advice.

## Woodlot Datebook

**April 13:** Spring meeting of NYFOA. Marshall Hall, SUNY College of Environmental Science and Forestry, Syracuse. Awards, elections, seminars for land owners.

**April 27:** Westchester County Forestry and Conservation Day. Pound Ridge Reservation, Cross River, New York. 914-285-2651 for details.

**May 4:** Woods walk at R. Bamber Marshall's "Deerhaven," near Yorktown, New York.

**June 22:** Woods walk at woodlands and Christmas tree plantation of Norman Richards, Delaware County, New York.

**July 20:** Woods walk at Evan James' place, Franklinville, New York.

**August 17:** Woods walk at property owned by Willard Ives, Troy, New York.

**September 13-14:** Fall meeting of NYFOA, to be held in cooperation with Catskill Forest Association at Frost Valley YMCA.

**October 5:** Woods walk at Jefferson County woodlands owned by William Lynch, Jr.

**October 13-16:** 110th annual meeting of American Forestry Association, Traverse City, Michigan. Theme: Private Forests — Centerpiece of America's Forest Resource. Contact AFA, 1319 Eighteenth St., N.W., Washington, D.C. 20036.

**March, 1986:** NYFOA tour to New Zealand. 607-659-5275 for details.

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*Materials submitted for publication should be addressed to: Alan R. Knight, Editor, N.Y. Forest Owner, 257 Owego Street, Candor, N.Y. 13743.*

*Written materials, photos, and art work are invited. Although the return of unsolicited materials cannot be guaranteed, they are normally returned after use.*

*The first day of the month prior to publication is the deadline for submission. Published January, March, May, July, September, and November.*

## A Message From the President

No matter where we go, trees seem to follow us. Perhaps we're following the trees!

The first week in January we were in Bermuda with an interesting Elderhostel group. We took a course entitled *Bermuda and Its Delicate Balance*. The site was the Bermuda Biological Station. Some facts we gleaned were: population density-3,000 persons per square mile; housing shortage, a waiting list of 900-1,000; each household responsible for its own water supply (from the roof); one small car per household; one boat per household; only 5% of the food consumed grows on the island; tourism is their only industry.

Therefore, **all** the fuel for electric power, autos, and desalination plants has to be imported – total dependence on the outside. An interesting analogy of this is the Casurina Tree, also known as the whistling pine or Australian Pine. Introduced to the island after the cedar blight killed native cedars in the early 40s, this fast growing tree has been

useful as a windbreak and fuel for the many fireplaces that do not have, or need central heating.

The scene shifts. Stuart and I are now in the Florida Keys where we have a cottage 150 miles south of Miami. The very same Casurina that provides fuel and windbreaks in Bermuda is considered a pest here, a weed tree. A recent article in the *Miami Herald* about the forest fires in southwestern Florida commented that some good comes from the fires.

"Limited fires help maintain the region's ecological balance. Fires help control the exotics that are making a steady march on the native wilderness: the Brazilian Pepper, *Australian Pine*, and melaleuca."

So, I wonder about species and their popularity. Many were favored by the forestry people and the state for reforestation in past years, and then there was little market for the species. Perhaps one man's jewel is another's junk. We all know that the black walnut is a money tree, but maybe the lowly casurina can be useful in both Bermuda and the Keys. We are having a hard time parting with our junk trees as we have been advised to do.

A parting word: in the photo with this article there is the NYFOA Membership sign, with the slogan "Growing Tomorrow's Trees Today." Not all of us have the foresight to plant a crop that might take thirty years or more to mature. There was a young investment counselor who had a new 90-year-old client. He said to her, "Madam, if you will let me invest \$10,000 of your money, I can double it in two years." She looked at the young man, and said, "Young man, at my age, I don't even buy green bananas."

We of the Forest Owners will keep on buying green bananas. We're in the business of leaving the forests better than we found them. ❖



Mary Soons McCarty

## It Is Not Enough To Own a Forest.



The challenge is to nurture it, to fulfill a destiny of beauty, productivity, and family pride...while turning enough dollars over to hang on to it. But how?

There are no easy answers, only ideas to ponder by the woodstove. That's what NYFOA is all about: ideas, family pride in forest management, and sharing of dreams.

Through regular issues of **The Forest Owner** magazine, frequent seminars and woods walks in one another's woodlots, and extended tours to extend the fellowship and learning in foreign lands, members of the New York Forest Owners Association are growing as surely as the trees in their woodlots.

**New York Forest Owners Association**  
Post Office Box 69,  
Old Forge, New York  
13420-0069

Yes, I'd like to learn more about The New York Forest Owners Association and how to get more out of my woodlands.

Name \_\_\_\_\_

Phone \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State/Zip \_\_\_\_\_

## March: Mud, Maple and Money



Mud season. New York's fifth season. The season of goose music, Phoebe calls from Chickadees, iced mud ruts and sugaring.

Paul Reed, who lives near me in Candor and who retired...sort of...from the sawmilling business half a decade ago still makes maple syrup. He is a lanky grizzled fellow. When you look at him, the first thing you notice is his sharp, clear blues eyes. He looked vaguely off into the distance when I asked him about making money at sugaring.

"Oh, there's a romance to it," he said, acting almost as though he were embarrassed to say it.

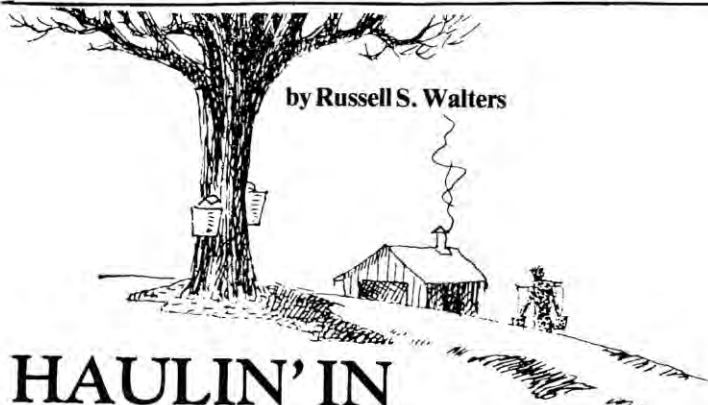
He'd do it if he had to pay for it.

But Lew Staats, a Cornell University extension service maple syrup specialist headquartered at Lake Placid, says things may be better than that, especially now. Demand outruns supply, and there aren't many agricultural commodities

you can say that about nowadays. Staats says a concerted effort by the New York Maple Producers Association and the New York State Department of Agriculture and Markets has opened new markets for New York maple syrup in supermarket chains and in the Sunbelt. Moreover, the age-old problem of irregular, undependable supplies has been moderated to a high degree by new technology. Suction pumps will take the sap out of a tree even when nature doesn't cooperate, and reverse osmosis equipment enables serious producers to obtain greater sap and fuel efficiency than before.

Addressing a meeting of maple producers in Cortland in January, Staats said, "This is the year to put out more taps." If so, it is also the year for the newcomer to the sugarbush to light his own romantic fire.

— Alan Knight



by Russell S. Walters

## HAULIN' IN THE SAP

Buckets have been used for collecting sap since the very beginning of sugaring in this country, the only real changes being from wooden to metal and plastic buckets and the increased use of bucket covers. These changes added immeasurably to sap quality and to the quality of the final product.

The most common used metal buckets are zinc coated and hold 15 quarts. Minute amounts of zinc dissolve in the sap and help reduce microbial growth. Lead coated metal or lead soldered buckets and buckets painted with lead paint should not be used for sap collection because lead may dissolve in the sap and exceed safe levels in syrup.

Aluminum buckets are popular in Canada and are considered very satisfactory.

Plastic bags have been used to some extent. They keep the sap cleaner and the sterilizing affect from the sun's ultraviolet light improves sap quality. When stored, they take up very little space, but the seams may split when the bag freezes full.

### *Sap gathering*

Gathering sap, whether from buckets or plastic bags, is very laborious. Most often a gathering tank on a sled or wagon is drawn through the sugarbush. Each bucket is emptied into a gathering

pail and that pail is emptied into the tank. Sap loss from spilling and missed buckets may be considerable. A system is needed to prevent missing a bucket or losing time checking an already emptied bucket. Some producers color-code their trees to identify the roadway from which the tree is to be serviced. Another idea is to bore two holes on opposite sides of each bucket and painting a stripe on one side. Each time a bucket is emptied, it is turned and hung from the other hole. Whether the stripe is exposed or hidden indicates readily whether or not a bucket has been emptied.

Pumps can be used to reduce hand labor, and dumping stations can eliminate the movable sap-gathering tank. Dumping stations are simply large buckets, milk cans or tanks strategically located in the sugarbush. Sap flows by gravity through a plastic tubing network connecting the several dumping stations in the sugarbush to the sugarhouse or main storage tank. Although this system is an improvement over older systems, sap can be collected more efficiently by a complete tubing system.

### *Plastic pipelines*

An early version of the plastic tubing system was installed in the 1930s, using galvanized steel tubing supported by

wires and stakes. But it leaked and was difficult to install and never attained wide usage. Plastic pipelines solved the problems, developed in the 1950s. Its advantages are considered to be: better distribution of labor; great reduction in amount of labor needed for sap collection; more sanitary collection and transportation of sap; elimination of costly building and upkeep of roads in the sugarbush; and higher yields by reducing infection in the taphole by airborne microorganisms.

Plastic pipelines were not immediately accepted. Some producers obtained excellent results while others could not make it work. When first introduced, the tubing went directly from spout to spout, from tree to tree, then to a larger main line and then to a storage tank. But during periods of weeping flows and when only a few trees are flowing, considerable quantities of sap may be absorbed by trees that are not flowing. Also, one taphole may be dripping sap while another taphole on the same tree may be reabsorbing it. Research in Vermont found that using a dropline down from the spout to the tubing system solved the problem.

The value of the dropline was established, but other questions persisted. Should tubing be suspended or laid on the ground? Should the system be vented or not? An aerial system is more difficult to install than a groundline, but it thaws earlier and freezes later, allowing a longer flow period, and it can traverse irregularities in topography smoothly. Groundlines may be more labor-efficient during installation where the topography is favorable, but they must be pulled from snow covering in order to thaw, and they require much more care to avoid hollows and hummocks. Gas exuding from the tree along with sap forms so-called gas or vapor locks, often cited as a cause of sap flow restriction. Venting was recommended as a solution to this problem. Each of these ideas had its advocates, and the design of plastic pipelines became very confused.

#### *Aerial or Groundline*

It is difficult to compare aerial and groundline systems without also considering the question of venting. In general, sap yields from groundline systems were not significantly different from those of aerial systems. However, unvented aerial systems seem to function better than similar unvented

groundline systems.

The more important differences between the aerial and ground systems are in installation and maintenance. The suspended system is above the snow, and less likely to be blocked by ice. The groundline will absorb enough heat to bury itself in the snow and will need to be pulled up to surface again almost daily. Installing a groundline is more than just laying tubing on the snow or ground. Depressions and hummocks must be avoided, as they create low points that can impeded sap flow. Further, droplines must be long enough to reach the ground after the snow has melted, otherwise they can also create bumps in the line that will hinder sap flow. A uniform grade can be achieved in a properly installed taut aerial system if the trees are not too far apart. Excessive sag is difficult to avoid on very long expanses (over 30 feet) without intermediate supports, especially in warm weather. Groundlines require much more tubing than aerial systems.

#### *Venting versus non-venting*

Results of important tubing experiments can be summarized as follows: natural vacuum, which will increase sap yield, can be developed in

carefully graded unvented lines on sloping land; natural vacuum develops to a lesser degree in unvented groundlines than in unvented aerial systems; with vented spouts, the method of tubing installation (aerial or groundline) makes little difference in total sap yield.

#### *The Best Idea?*

The closed dropline aerial system appears to be the most productive of the various installations tested. In this system, the lateral 5/16th inch tubing is usually hung 2 to 4 feet above the ground or snow level. Droplines 18 to 24 inches long are used to connect the spouts to the lateral lines. The longer droplines are especially helpful on trees that have more than one taphole because they provide greater flexibility in locating new tapholes in subsequent years. Lateral lines, in turn, are connected by manifolds or four-way Y joints into larger (1/2 inch or more) conduits or main lines to form an overall network for an entire sugarbush. Advantages of the closed dropline aerial system are: minimizing of freezing problems; slope of tubing lines is easy to control; amount of tubing is minimized; problem areas are easier to locate and correct; and tubing can be used on nearly flat areas.



*Tubing and vacuum pumps have practically revolutionized the maple syrup business.*

On the other hand, it is harder to install than groundlines. It can develop sags, but it must not be stretched too tight or it will pull loose of its fittings.

#### *Vacuum pumping*

One of the early objectives of vacuum pumping was to help move sap through the lines. Cornell's Dr. Robert Morrow stated that vacuum pumping aided in removing sap from the lines during slow runs, broke air locks, and helped clear lines before night freezing.

Vacuum pumps, when used in air-tight, leak-free tubing systems, can more than double sap yields over buckets. Vacuum pumping accomplishes two things that account for this increase in production: it produces sap on days when sap would ordinarily not be running and it increase the rate of sap flow during the normal flow periods.

It is well understood by sugar-makers that sap flow coincides with a rise in tree pressure which is triggered by a change in temperature from below freezing to slightly above freezing. And, when tree pressure is greater than atmospheric pressure, sap will flow. Vacuum pumping, by pulling air from the tubing system, has the effect of lowering the atmospheric pressure within the tubing — thus creating a pressure differential. Applied vacuum will work only when the differential between internal tree pressure and outside atmospheric pressure is within about 3/4 of an atmosphere.

It seems unlikely that vacuum sap collection has any great effect on the structure or vigor of maple trees. Trees from which sap has been collected under vacuum for 10 years or more do not show signs of reduced vigor. \*

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*Editor's Note: Tubing represents one of the most important technical advances ever to hit the maple syrup business. Together with the newer advances in reverse osmosis, tubing has brought the sugarbush into the modern age of agriculture. Capital has replaced labor. And now, at least for now, economic opportunity has joined romance in the maple orchard.*



*Deerhaven, site of the May 4th woods-walk, near Yorktown.*

## Spring Woodswalk In Westchester

A Westchester County woods-walk will be held in Yorktown at 10 a.m., May 4, 1985. All NYFOA members are invited to enjoy an outdoor-indoor picnic at Deerhaven, home of forester R. Bamber Marshall.

Marshall's forest is chiefly oak-hickory (forest type 52) in sawlog-size trees, formerly over 100% normal stocking. Now with understory thinning of less worthy trees for firewood, the forest has narrow openings extending through it like spokes of a wheel from the picture windows of the house. Selective thinning of sawlog-size trees will be discussed.

Visitors to Deerhaven will also see a climax forest of hemlock-hardwood above a beautiful trout stream, a pole-sized stand of black birch historically old

field, and variable terrain, land use, and forest types.

As the tour progresses through the forest, members will be able to see wildflowers, birds, animals and particular trees as they relate to forest types and age classes, land use history, topography and soils.

We will consider this forest and its management in the context of the Lower Hudson Valley and its suburban values.

Remember that Deerhaven is on Baptist Church Road, north of Croton Reservoir, west of the Taconic Parkway, exit at Baldwin and Underhill Roads, and dead-ending at Baldwin Road. Go over the hill from a yellow and green mail box (number 329) on Baptist Church Road. \*

# New in the Woodlot

## ATV SPRAYER KIT

Ag-Chem Equipment Co., Inc., is offering a spray tank to mount on the back of your three-wheeler. Called the ATV-10, it can be used for spot spraying around buildings, near fence rows and in hard-to-reach areas. It has a ten-gallon poly tank that mounts on the utility rack. It also features a 12 volt demand pump, on-off switch, handgun, pressure gauge, manifold stand, and 20 feet of 3/8 inch chemical resistant hose. An optional 5 foot boom kit is height-adjustable and has 3 outlets spaced at 20 inches. A 40 inch extension has spring-loaded breakaways to increase the boom to 100 inches. Contact Ag-Chem Equipment Company, Inc., Industrial Park, Jackson, Minnesota 56143. Telephone 507-847-2690.



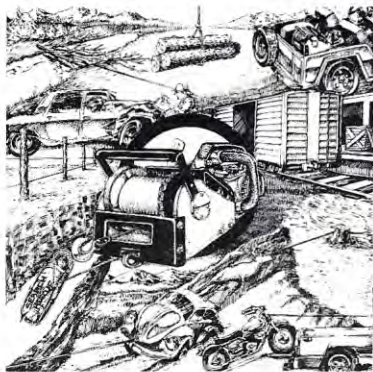
## ATTEX 750

This is definitely new and different. It's a truck. No...it's an all-terrain vehicle. No...it's a firewood hauler. No, it's probably anything you want it to be. The standard version includes a dumping cargo bed, stake bed or six passenger personnel carrier. All have wide-angle sealed beam headlights, tail lights and reflectors, heavy duty 12-volt battery, trailer hitch, padded seats, forward/neutral/reverse transmission and 26 inch diameter tires. The ATTEX 750 is fully amphibious with its high-density polyethylene body and has a maximum water speed of four miles per hour, with a land speed of 40 miles per hour. Options include a 16, 20, or 40 horsepower engine, all with electric start; heavy duty tires; windshield kit; grader blade; dump trailer; and an all weather cab with removable curtains. Contact Mr. William Richards, Attex International, Inc., 6168 Woodbine Avenue, Ravenna, Ohio 44266. Telephone 216-297-077.



## CHAIN-SAW WINCH

This gizmo allows you to convert your chain saw into a power winch. It has a drum capacity of 300 feet of 532 aircraft cable, uses roller and needle bearings, and can lift 1300 pounds vertically. It also has a drum brake with positive lock. It weighs 38 pounds when loaded with 200 feet of cable and hooks. The gear ratio is 220 to 1. Contact True Dimensions, Inc., 10776 S.E. Highway 212, Clackamas, Oregon 97015. Telephone 503-650-0699.



## STIHL CHAINSAW SAFETY BOOK

The 24-page manual identifies and diagrams all the parts of a saw, describes proper clothing and working conditions, preparation and operation of the saw, reactive forces and felling methods. If you are like most weekend warriors in the woods, you probably expect too much of yourself and your saw. This manual may help you be more realistic in your expectations. Contact Marketing Services Department, Stihl Incorporated, 520 Viking Drive, Virginia Beach, Virginia 23452. Send 50 cents for handling and postage.



A 45-year-old maple plantation. Spacing was exceptionally wide at 40 by 40 feet, and crowns are just closing. The trunks average over 15 inches in diameter.

# Sugar Bush Management

by Robert Morrow



Maple syrup and sugar are important products in several northeastern states and much of southeastern Canada. New York is a leading producer with an annual crop valued at approximately \$5 million. Though maple sap may be obtained from roadside or ornamental trees or trees on the edges of fields, it more commonly comes from a wooded area — a sugar bush or sugar grove. Continued and improved production depends on the proper development and management of the sugar bush.

Although maple sap can be obtained from all the native maples, sugar maple *Acer saccharum*, also known as hard or rock maple, is best. It may yield 50 percent more sap, with a higher sugar content, than red or silver maples. Since the latter also bud early, the sap, when mixed with the sap of sugar maples, can degrade or ruin late-season syrup. On the other hand, black maple produces a sap similar to that of sugar maple. Where it occurs, it can be retained in the sugar bush along with sugar maple, but other maples should be removed.

Sugar maple is the most common tree in New York. It is tolerant of shade and, given enough light, it grows vigorously

on a wide variety of soils. Thus it is well suited to succeed in many places following harvest or windthrow of conifers and other trees. Pure stands of sugar maple are not uncommon.

Because of its high tolerance of shade, sugar maple can persist for long periods of time with little growth. Seedlings may remain in heavy shade for decades with little apparent growth. Crowded young trees remain as poles too small to tap. Close-spaced tapped trees have small crowns with too little leaf area to produce sweet sap. Younger sugar maples, however, have remarkable recuperative powers. Trees released from overhead shade and side competition can double or quadruple their growth if the crown of leaves is still vigorous. Thus *thinning of young maple trees* to allow more space and growth is the *most rewarding activity* in managing the sugar bush.

Though sugar maple grows in many places, it grows best and produces more sap where there is ample moisture. Deep, moist, well-drained soils with medium or fine texture are best since they normally have plenty of nutrients as well as moisture. Glacial tills and ben-

ches are good sites. Sandy soils that hold moisture and fine, shallow soils with sufficient drainage can have moderate to good maple growth. Swamps, dry sands, and thin rocky soils should ordinarily be excluded from sugar bushes.

Sap production is often more influenced by topography than soil. North facing slopes have maximum moisture but receive little sunlight and may be too cold. Southwest facing slopes may be too dry. Southeast facing slopes are usually best. Also, low-elevation bushes are usually moister and more protected from cold winds, and can be expected to flow earlier and sometimes more. High, exposed bushes may be drier and usually flow later, and seasonal production may be lowered.

Seed production is so commonplace and prolific that new sugar bushes are easy to establish. New maple forests develop in old fields. To renew an old sugar bush, it is necessary only to exclude livestock from the area and reduce overhead shade by harvesting merchantable trees or culling trees with chemicals. Although selection thinning may result in a scattering or small groups of young maples, it is usually preferable to make larger openings by removing a quarter to a half acre of overhead shade





at one time. Such openings favor maple over beech and provide larger groups of maple seedlings which are more easily managed. However, excessive light may encourage too many intolerant species such as cherry and birch. Large deer populations may delay or reduce maple reproduction as well as deform young stems. Where too many deer are present, early and sizable crown openings are needed to encourage seeding and rapid growth of saplings above deer browse level.

Sugar maple is a valuable tree. It often commands the highest of prices for logs to be made into furniture or flooring. Its density and weight account for good pulp yields and a high fuel value. It is a prized ornamental and shade tree and, of course, the best sugar producer. Direct conflict exists between growing trees for quality timber and growing them for syrup. The former is enhanced by tall, straight stems with no branching below the growing crown, whereas efficient sugar production is promoted by wide crowns with leaves near the ground. Sugar bush management may involve a compromise between the two types of growth or, perhaps better, concentration on development of the younger trees near the sugar house that

are best suited for crown growth, sugar production, and ease of sap collection. On the other hand, wood for pulp or fuel can be obtained without conflict from the thinning needed to promote growth in the sugar bush.

Syrup production per acre varies little with tree or crown size, probably because the amount of solar energy falling on the leaves is the same. In dense forest stands, however, most of the annual sugar production is required for stem development and other aspects of tree growth. In open-grown trees there is relatively more sugar left for the spring maple-sap crop. The superiority of the vigorous, more open trees is found in more efficient collection and evaporation of sweeter sap as well as possible higher yields per acre. Also trees reach tappable size much sooner, tapholes heal more quickly, and new tappable wood is grown at a faster rate.

Most sugar bushes fully stocked with sugar maple have about 100 tapholes per acre, each yielding a yearly average of a quart of syrup. This amounts to 25 gallons of syrup per acre per year. More open bushes with large trees usually have fewer taps (60-80) but more and sweeter sap per taphole. They may yield 1½-2 quarts of syrup per tap, or 25-40 gallons of syrup per acre. Sugar bushes that contain numerous other species produce much less. Minimum levels for profit are estimated at 30 taps per acre and 200 gallons of syrup overall.

The technical aspects of sap collection and transport can be as important to the ideal sugar bush as high-producing trees. For tubing, land with suitable slope (10 percent optimal) and facing toward a few central collection points is best for maximum vacuum and sap flow as well as ease of collection. Collection points should be accessible to roads and near the sugar house.

## Thinning the Sugar Bush

The amount of sunlight reaching any particular acre of forest changes little from year to year. Except when there are extreme droughts or fertilizer is applied, the same holds true for moisture and nutrients. Thus the land supports a certain amount of woody growth. Consequently, thinning or removal of unwanted trees does not ordinarily increase or decrease growth or sugar production per acre. The purpose of thinning is to select and keep the better trees to benefit from the available light, water, and nutrients. However, thinning does

greatly influence the distribution of growth. Thinning to create an open stand allows sunlight to reach the sides as well as the tops of tree crowns; deeper crowns, sugar production nearer the base of the tree, larger stem diameters, and more available sugar near the taphole result.

Tree response to thinning depends on a healthy, vigorous crown and the amount of release. Heavy thinning of young maples with good crowns causes rapid branch extension and can readily double stem diameter growth. Typical middle-aged, forest-grown trees have small crowns that show little response. Crowns of old trees have too little vigor. Therefore, thinning is best started when the trees are young and should be repeated at 5-10 year intervals to keep the crowns vigorous. Failure to continue thinning after the first time results in shading and eventual death of lower branches and loss of crowns.

### *Thinning objectives*

Thinning prescriptions vary with the age, vigor, and condition of the sugar bush. Young sapling stands are treated differently than old, grazed bushes. However, thinning objectives may include the following:

- Convert area entirely to sugar trees — eliminate red or silver maples and non-sap-producing species from the sugar bush. More tapholes per acre reduce the fixed costs of tubing and roads as well as increase production.

- Develop the best sugar producers — select and grow healthy sugar maples with the best crowns and stem diameters or those trees already known to be good sugar producers.

- Hasten diameter growth so that trees reach tappable size (10" in diameter at 4.5' above ground) sooner; more sap is obtained from larger trees; tapholes heal more quickly; and more fresh wood is grown over old tapholes.

- Remove conifers that shade tube lines or tapholes and thus delay thawing and diminish sap runs.

- Hasten seedling growth to renew old stands. Heavy thinning may be needed before the harvest of old trees to encourage seedlings to grow into young saplings with terminal buds above deer browse level.

- Obtain usable wood products especially fuel wood for evaporation.

### *Selection of crop trees*

The crop trees are those trees selected to be favored for future growth and

sugar production. More crop trees are selected in young stands to insure against losses and assure food trees for the future. By middle age the crop trees may simply be the tapped trees unless stand is greatly overstocked. Young crop trees can be identified with a paint mark for future reference.

Thinned trees are those selected to be removed so that crop trees will grow better. They are usually those trees that most crowd the crop trees. Filler trees are those that remain and fill the spaces between the crop trees. Filler trees, predominant at very young ages, are often too small to be valuable but help to preserve a forest atmosphere. They reduce the danger of overexposure, especially to sunscald, maple borer, or wind damage, of crop trees. In succeeding thinnings, filler trees, as well as excessive crop trees, becoming thinned trees. Eventually, under ideal conditions, only some 25-40 large crop trees per acre, spaced 35-40 feet apart, may remain.

The first and most important step in thinning is the selection of the crop trees; only after that can you properly pick the trees to be thinned. Remember that selection of crop trees will influence current and future thinnings and is the key to sugar bush quality for the remainder of its lifetime.



*Drilling tap holes is made easier with drill modifications on chain saw power-plants.*

### **Thinning guidelines**

Thinning recommendations are best made in the individual sugar bush. However, guidelines suggest the amount or degree of thinning. These guidelines are based on average stem diameters at 4.5 feet above the ground and are ap-

plicable to groups of trees or to stands that are nearly the same age and height.

The table shows the minimum stocking (number of trees per acre and average spacing between trees) for a sugar bush, based on the assumptions that sugar maple is the only species present and that tree crowns almost touch each other. It is equivalent to having open-grown trees placed next to one another in a forest grove. To have fewer trees is to fail to make full use of the site and to prematurely encourage maple reproduction as well as weed growth.

Middle and maximum stocking levels are arbitrary standards. Even though many sugar bushes are more dense, maximum stocking is set at the same levels as the minimum stocking prescribed for full sawlog growth.

Middle stocking on the other hand, is considered too light for sawlogs and too heavy for optimal sugar production. Where thinning has been delayed but trees remain vigorous, it may be a desirable level for the sugar bush.

Sugar bushes with full-crowned trees, at the minimum level of stocking, are rare. Three intensive thinnings are needed by age 20, nearby trees being removed on the basis of expected crown growth. Successive thinnings free the crown area for *average* distances of 6, 8, and 10 feet in each direction from the center of the crop tree crown (thinning radii) to provide sufficient growing space.

Commonly, the problem is what to do with an untended sugar bush. A simple thinning guideline is to reduce the stocking to the maximum level or the middle level or the middle level or below. The latter is dangerous however, except in young and vigorous stands, since it would likely result in too large openings with considerable risk of sunscald, maple borer, and possibly wind damage or other "shock" factors.

There is also a D-plus rule. It calculates the needed growing space from the stem diameter. For example, a 6-inch tree needs freeing for an average distance of 8 feet ( $D + 2$  equals  $6 + 2$  which equals 8) in each direction to make room for crown development to a total width of 16 feet before the second thinning. The rule assumes that the crown is sufficiently vigorous to grow well following thinning.

Stands are often greatly overstocked with 5-10 thousand or more trees per acre. Maximum crown development is possible by starting a thinning program now, but costs are high. Select about 200 crop trees per acre. Include the biggest

and most dominant sugar maples — the tallest with widest crowns and large diameters. Selected trees should be healthy, vigorous, and free of large cankers, rot, or borer damage. Stems of seedlings origin are preferred over stump or other sprouts; avoid forked or bent stems that may be too weak. Spacing can vary from 10-20 feet apart with an average of 15 by 15 feet.

For each crop tree, thin out competing trees to release the crown for an average of 5-6 feet from its center. Include all trees that touch the crown of the crop tree. Small, over-topped stems can remain, but pay special attention to nearby trees of other species that grow exceptionally fast and could soon over-top the crop tree.

The released crop trees can be expected to grow between 5 and 8 rings per inch or about 2.5-4 inches per decade. The crowns will expand rapidly, as much as 4-6 inches in each direction each year, and the stand will need thinning again in about 5 years.

Most people delay thinning until the polewood stage. However, much of the lower stem (15-30 or more feet), is already devoid of branches. Successive thinnings can develop wider crowns, with increasing depth, provided the trees continue to grow in height.

If the sugarbush has gone this long without management, select 100-150 crop trees per acre. They should include the most dominant trees — those with largest crowns and bigger diameters. They should be healthy, vigorous, and relatively free of major defect such as a canker, rot, borer damage, or weak stems. Selected trees should be 15-25 feet apart.

In addition, you can select for sweetness among prospective crop trees. With a sharp awl, make a hole through the bark. Collect at least a drop of sap. The sugar content can then be measured with a sap refractometer. Test all the trees on an acre within a 2-hour period to minimize the effect of normal changes in sugar content during the day. Avoid windy or rainy days which could influence the size or sugar content of drops of sap.

Release each crop tree by thinning out trees on all sides, using the thinning radius guideline. All trees touching the upper crowns of crop trees should be removed in young stands. Larger trees (6"-8") in older stands may receive some "shock" from such a rigorous treatment; thinning should be somewhat lighter with an occasional competitor allowed

to remain for the time being. All narrow-crowned, adjacent "whip" trees, however, must be removed.

Trees with vigorous crowns respond quickly and will need thinning again in 5-8 years. Light thinning as well as vigorous growth may shorten the period between thinnings. Inevitably, some very good trees must be thinned out along with poor trees.

If thinning is delayed until trees reach tappable size, less can be accomplished. Trees are older, less vigorous, have lost much of the lower crown (30-40 or more feet), and are less capable of responding quickly to release. Nevertheless, thinning is of continued importance to encourage wider crowns and faster growth of stems. Even where trees are no longer sufficiently vigorous to respond well, thinning is needed to retain current crown size and growth rates.

Stem diameter growth in still vigorous stands can reach 10 rings per inch or 2 inches per decade. This is of particular importance both for increasing the number of taps per taphole. The amount of sap per taphole per year increases about 10 percent with an increase of 2-3 inches in diameter for trees of this size.



*A well planned sugarhouse provides for wood storage under cover.*

trees can be harvested for timber, and others will make excellent fuel wood.

Trees over 15 inches, mature trees, receive little benefit from thinning. Heavy thinning may even have adverse effects, including dieback in the crown. Little response can be expected from old trees, middle-aged trees with small crowns, or trees growing on poorly drained or dry soils.

Too often sugar bushes are thinned once and then neglected. Since the effects of normal thinnings are short-lived and since one or two excessive thinnings may be harmful, there should be numerous thinnings during the life time

considerable interest, but results of experiments have been inconsistent. A recent Canadian experiment, in which 250 pounds of ammonium nitrate were applied per acre for 4 successive years, yielded some 30-50 percent more sap with little change in sweetness. Earlier studies have been less convincing. Sugar content has sometimes been increased; in one case, it was decreased.

The likelihood of increased tree growth and sugar production following fertilization probably depends on a careful analysis of soil deficiencies and a suitable prescription to correct these. Otherwise, gains may be no more than can be obtained by needed thinning. The high energy costs of manufacturing fertilizer are likely to make fertilization a poor investment for many sugar bushes.

#### *Establishing a sugar bush*

Ease with which seedlings develop under natural conditions and following harvest has made planting generally unnecessary. High planting costs are unattractive.

But with the future development of superior maple plants having the potential to yield more sugar and sap, planting sugar orchards may become popular. They will be costly and so will merit excellent soils with sufficient protection from frost, wind, and sun as well as good management. A first consideration is the initial spacing. If 40 trees per acre are wanted for the final stand, they will be spaced an average of 33 feet apart. This final spacing can be obtained by planting trees at 16-17 feet apart and eventually keeping only the best 1 of 4 trees planted.

The Northeastern Forest Experiment Station is currently working on genetically superior maples as well as trying to solve the many problems encountered in large-scale nursery practice and growth of outplants. \*

**Number of trees per acre and average spacing**

Average stem diameter	*Minimum stocking		Middle stocking		Maximum stocking	
	Trees per acre	Average spacing	Trees per acre	Average spacing	Trees per acre	Average spacing
Inches	Number	Feet	Number	Feet	Number	Feet
3-4	260	13				
5-6	150	17	210	14	335	11
7-8	100	21	145	17	205	14
9-10	75	24	110	20	145	17
11-12	60	27	85	23	110	20
13-14	50	30	70	25	85	23
15-16	40	33	60	27	70	25
17-18	35	35	50	30	60	27
19-20	30	38	40	33	50	29

Select 80-100 crop trees per acre, including the known best producers — high sugar content and (or) good sap flow. Where necessary, emphasize elimination of other species to encourage more sugar production per acre. Strive for good distribution — crop trees spaced 20-25 feet apart. Some tappable sugar maples may need to be thinned out, the number of taps per acre being temporarily reduced. Larger thinned

of a sugar bush. Young, vigorous trees quickly extend their branches into openings and need thinning again in about 5 years. Thinning should continue periodically as long as the trees respond well in diameter and crown growth.

#### *Fertilization*

The use of commercial fertilizers to increase sugar production has been of

# Five Woods-walks Set for Coming Year

Woods-walks committee chairman A.W. Roberts, Jr., announces a schedule of five woods-walks for the enjoyment and education of NYFOA members. Forest owners with questions can contact Mr. Roberts at 981 Route 222, Cortland, NY 13045 telephone 607-756-5956.

**May 4, 1985:** Host is R. Bamber Marshall, at Deerhaven, near Yorktown. See adjacent article for details.

**June 22, 1985:** Host is Norman Richards, a forestry professor at Syracuse. This walk will be conducted at Mr. Richards' 190 acre property in Delaware County.

**July 20, 1985:** Evans James will host this walk on his property of 221 acres of hardwood and softwood. The softwood is in plantations ranging from 25 to 45 years of age. The hardwood has not been extensively cut for 40 years.

**August 17, 1985:** Willard Ives was the New York Tree Farmer of the year. The Ives family uses the property for timber and Christmas trees. They also have developed a cross-country ski trail system that is open to the public for a fee.

**Autumn, 1985:** William Lynch, a director of NYFOA, will guide association members and guests through his north country properties.



*A woods-walk can be the very best way to see forestry at its friendliest, most practical application. Come! Learn from your hosts and fellow guests.*



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# Computers and the Forest Owner

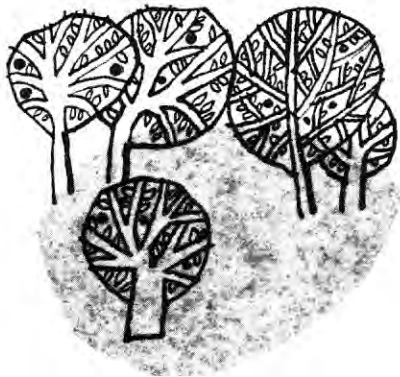
by John Gifford\*

Whether you own a small, managed woodlot of 10 acres or forested lands rivaling the area of a National Forest, it is a safe bet that somewhere along the way you could benefit from the use of a computer. The advent of the microcomputer has brought you an affordable and extremely efficient tool. Now, large amounts of field data that used to take enormous amounts of hand-calculating time are literally gobbled up and arranged into orderly, meaningful reports in a fraction of the time. Computers can now be used for almost any forestry concern, from management planning to timber inventory to financial analysis to you-name-it. The sky's the limit (or is it the forest?!). And the use of computers by professional foresters can translate into financial savings and more accurate, expedient work for the land owner.

Numbers and computers get along quite well, and quite quickly, I might add. A computer can process and report an answer to a complex system of mathematical equations in the blink of an eye. And the axiom that time is money certainly applies to forestry. The less time spent on processing data, the less the cost of the job.

Computers are also very efficient managers. They can maintain thousands of records, search for specific items, or present reports in a variety of formats most useful to the land owner. These reported might include proposed cutting and thinning schedules, projected

\* the author is employed by Forecon, a forestry consulting firm in Jamestown, NY.



growth schedules, even cash flow schedules, all providing the forest owner with valuable information almost at a moment's notice.

A forester can even project an accelerated growth of a woodlot to see the results of various management options. He can add 10, 30, 50, even a hundred years to a woodlot for a view into the future. Think about this for your forest landholding! Management actions can be wisely selected and simulated on the computer before embarking on a well-intentioned, but less-than-ideal management scheme. It can give us that 20-20 hindsight we've always been looking for.

But, let's not forget that the computer is not the "Wizard of Oz" come-to-save forestry. It is simply a tool; a very valuable tool. It is not the Omnipotent Guru of the forestry world. It is only as good as the program in it and the professional using it. "Garbage in, Garbage out," so the saying goes.

We all stand to benefit, both financially and expediently, from the aid of a computer in the hands of a competent and experienced professional. ❖

## NEW MEMBERS

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Syracuse, New York

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Keene, New York

Frances Monahan  
Staatsburg, New York

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Ted Nakoski  
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Thomas J. Cruger  
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Catherine and Michael  
Nobiletti  
Forest Hills, New York

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Big Flats, New York

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R.E. Manning  
APO San Francisco  
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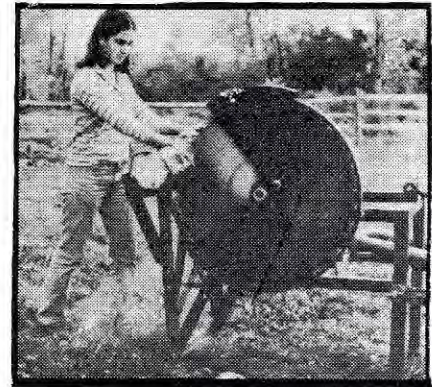
Bernard Schneider  
Fayetteville, New York

Ed Slocum  
Cuba, New York

# Yankee Woodsaw

Hook it up to your 3-point hitch. Attach the PTO—then move your Yankee Woodsaw anywhere you want. You're ready to cut cordwood, pulpwood, firewood, ties or any other type of wood.

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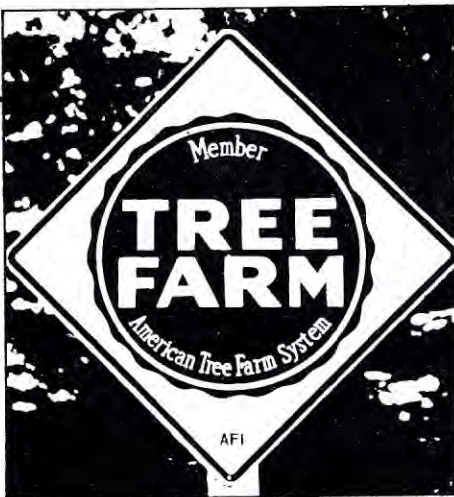
And it is the Tree Farmer who will make possible the lumber, wood fiber, and other natural resources America needs for tomorrow's growth.

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Alan Scouten, Chm.  
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I am interested in additional information on how I can manage my woodlands to meet Tree Farm Standards.

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Got a question?

## ASK A FORESTER

### Tax Incentives

Please send me any information you might have on hand on what part-time farmers can do with small sections of woods (10 acres or more) regarding tax incentives.

— C.D.C.  
Cherry Valley, NY

*While the association is not geared up to be an extension service or a library (there is no staff, just us part-time hackers), I just happened to receive a packet on this topic from the Department of Environmental Conservation forester Tom Wolfe. So, I send it to you with a modest bill to cover photocopying and postage. I hope it helps.*

— the editor

### Forest Owner Protocol

A question was once posed to Ann Landers and I'd like to know what foresters and forestland owners think: "Is it polite to ask country people how many acres they own? Isn't it the same as asking how much money they own? I am embarrassed when people ask."

— M.S.M.  
Sugarloaf Key, Florida

*Ann Landers answered, "Why are you embarrassed? Too few or too many? I don't think the question is in poor taste. But what do I know? Me in my Chicago apartment. How about it, you folks who own property? Am I wrong?"*

*Well, readers . . . how about it?*

— the editor

### Unloading a Forester

Although I would not think it typical, I have been completely dissatisfied with the work of our consulting forester. He rejected bids without even telling us what they were or that he had done so. We heard it weeks later from the mill operators. How do I terminate my contract and get somebody else?

— A.R.K.  
Candor, NY

*If there is no contractual arrangement between the forest owner and the forestry consultant, there should be nothing inhibiting the forest owner from dismissing the forestry consultant and seeking a new one. Contracts between owners and consultants usually contain a provision for terminating the contract. If there is no such stated procedure for ending the relationship, a frank discussion between the parties would be in order. I can't imagine a consulting forester working for a client who is dissatisfied with his services. The basis of a sound relationship between the owner and the consultant is mutual satisfaction.*

— Curtis H. Bauer  
Forestry Consultant  
Forecon, Inc.  
100 E. Second Street  
Jamestown, NY 14701  
716-664-5602

### Maple Syrup Short?

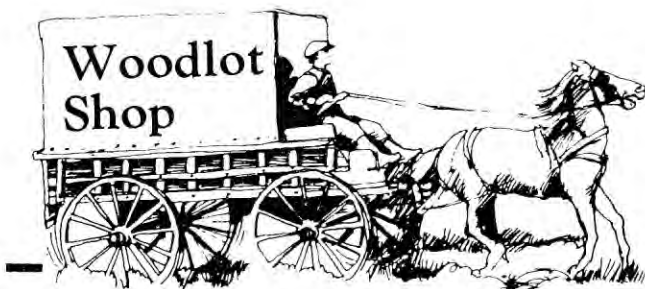
I have heard that there is a shortage of maple syrup and that this might be a good time to get into the business. Is this true?

— R.J.L.  
Erie, PA

*Many New York maple producers acknowledge having a very good retail and wholesale sales year in 1984. Recently, new markets have been developed through the joint efforts of the New York State Department of Agriculture and Markets and the New York Maple Syrup Producers Association. The word from maple producers who are involved in large scale marketing is that present syrup supplies are very low and a normal production season in the entire maple syrup producing belt may yield an inadequate supply for existing markets.*

*The benefits of market expansion to maple producers should extend beyond the 1985 season.*

— Lewis Staats  
Cornell Extension maple specialist  
Uihlein Research Farm  
Lake Placid, NY



**For sale:** Approximately 25 acres of level land, great for dry kilns or sawmill; buildings include grading shed, storage sheds, modern office. One mile off major highway. Contact Cadosia Valley Lumber Company, Inc., Box 567, Hancock, NY 13783. Telephone 607-637-5495.

**For sale:** Standing black walnut, 19" circumference at breast height. Height to first limb is 6 feet, branch spread over 100 feet and tree height 75 feet. 3000 to 4000 board feet good lumber in this tree. Contact Norman Downing, P.O. Box 50, Warnerville, NY 12187. Telephone 518-234-2480.

**For sale:** Firewood processor, truck mounted, Barko loader, Pettibone slasher saw, 5-way splitter, \$15,000. Contact Catskill Forest Association, Arkville, NY 12406. Telephone 914-586-3054.

**For sale:** Log truck, 1970 GMC 7500. Engine perfect, body fair. With John Deere 345 mounted log loader, new hydraulic pump, new clutch, excellent rubber. \$4750. Contact Back Home to Logs, Inc., Box 112A, County Road 26, Parish, NY 13131. Telephone 315-625-7191.

**For sale:** Hardi back-pack sprayer (just like a Solo). Great for spot spraying of weeds in Christmas tree plantation, pasture, woods. Used once. Too heavy for my wife! \$100 (for the sprayer, not the wife.) Contact Alan Knight 257 Owego Street, Candor, NY. Telephone: 607-659-5275.

**Forest Owners Tour:** New Zealand, early March, 1986. Visit other forest owners and Christmas tree growers in this agricultural paradise. Tour arranged especially for forest owners by forest owners. Sponsored by New York Forest Owners Association. Contact New York Forest Owners Association, 257 Owego Street, Candor, NY 13743. Telephone 607-659-5275.

**For sale:** Christmas trees are a good cash crop. We have the planting stock. We also have deciduous shrubs, trees, and ground covers, including nut trees. We do planting in nearby counties. W.C. Cottrell, 5577 South Geneva Rd., Sodus, New York 14551. Telephone 315-483-9684.

**For sale:** Christmas tree seedlings. Special 5-8" Woodsplants, \$95 per thousand. Superior Balsam Woodsplants 8-15", \$200 per thousand. Balsam Woodsplants 8-15" transplanted in trenches at least one year and fertilized, \$400 per thousand (available after 8/15/85). Contact Walker's Tree Farms, East Burke, Vermont 05832. Telephone 802-626-5276.

**Wanted:** Mixed hardwood saw logs delivered to Newfoundland, Pennsylvania. Contact Cadosia Valley Lumber Co., Inc., Rt. 191, Newfoundland, Pennsylvania 18445. Telephone Jim Vitale at 717-676-3400.

**Wanted:** 4/4, 5/4, 6/4 and 8/4 FAS/F1F hardwood lumber in all stages of drying; also all thicknesses of eastern white pine, furniture grade or better. Contact Ronald California, Mann and Parker Lumber Co., Box 18, New Freedom, Pennsylvania 17349. Telephone 717-235-4834.

**Wanted:** Low grade hardwood, preferably oak. Will buy your odd lots in all thickness and pay cash on delivery. Contact Jules Budoff, Budoff Outdoor Furniture, P.O. Box 530, Monticello, N.Y. 12701. Telephone 914-794-6212.

**Wanted:** Red cedar pulpwood, 4-foot lengths at roadside. Any amount. Contact R. Schager, Altamont, N.Y. 12009. Telephone 518-861-6954.

**Wanted:** Standing timber, hardwood or softwood, esp. white pine and hemlock. Contact Edwin Davis, R.D. 1, Box 1J, West Edmeston, NY 13485. Telephone 315-855-7822.

**Wanted:** Large, dried, fir beams, specifically 12 by 12, 10 by 10 and 3 by 10. Would appreciate leads on this, too. Contact Mark Sanders, Estimator, Wilson Development Systems, Inc., Rochester, NY 14620. Telephone 716-461-3193 7:30 am. to 5:00 pm.

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\$25. Any black and white glossy photo in the ad will cost \$10 to \$20 additional, depending upon size. Please inquire about specific cases and for circulation and demographic information. Contact Alan Knight, Editor, 257 Owego St., Candor, New York 13743. Telephone 607-659-5275 evenings.



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