Cooperative Extension Service
University of Illinois at Urbana-Champaign

ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

IN THIS ISSUE

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Volume 1, 1998 No. 34

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and the Cooperative Extension Service. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave. Urbana, IL 61801.

The following article is reprinted from a University of Illinois Cooperative Extension Service publication entitled "Farm Your Forest" by Theodore W. Curtin. Information presented in the article has been revised to reflect changes since its original printing. Terms in **bold** face appear in the Glossary.

FARM YOUR FOREST

The basic unit of agriculture is the farm, but all too often, farmers do not include their woodland or marginal land areas as part of their total farm operation. Managing the forested areas of a farm should be equally important and integral to its operation as is the management of other crops.

Unfortunately, wooded areas are often not managed, and landowners overlook important sources of income and much enjoyment. Besides providing basic information about the harvesting and marketing of timber products, this circular helps landowners begin developing a plan for managing or farming their forest. Like farmers of other crops, those who farm a forest need a management plan to develop their forest to its greatest potential. An outline of a forest management plan suggested by the Illinois Department of Natural Resources is provided in Appendix A.

Left unattended, a forest may revert to a jungle of weeds, brush, and trees of little value. It could become overgrown

or understocked with trees that mature more slowly; the wildlife habitat of such a forest could degenerate; and its recreational values could decrease. It could also become more susceptible to disease, insects, fire, and other hazards.

To be profitable, tree fanning, like the farming of other crops, may require special crop varieties, fertilizers, or improved harvesting techniques. The condition of a **stand** or continuous group of trees should dictate the allocation of time and resources. Tree planting may enhance an existing stand. Thinning and tree removal may be necessary to provide additional room for the remaining trees to grow and develop. Most important for the vigor, productivity, and profitability of a forest is cutting or harvesting at the appropriate time to prevent the waste of this valuable resource. These cultural practices are all part of good forest management.

A degree of stewardship accompanies all land ownership. Nearly three-quarters of all commercial forestland in the United States is privately owned. These forests provide the fiber for our morning paper and cereal boxes as well as the wood for our furniture and homes. Because of this constant demand for forest products, a managed tract can afford an annual income or a growing bank account for emergencies. In addition to supplying traditional forest products, well managed forests make woodlands more attractive and healthy, increasing their recreational potential and their wildlife. Nature lovers, hikers, skiers, hunters, and others receive enjoyment from such forests. Because a well managed forest enhances this enjoyment, it increases the value of property and makes an estate more valuable for family and heirs. Pre-occupied with annual crops, some owners of forestland in Illinois have ignored the benefits of a good forest management plan. This lack of concern has greatly affected the productivity of their forestland and degraded scenery, recreation, and wildlife.

Often the result of decades of past abuse, most forests today have developed without such a plan. In Illinois, tree **growth** has been only one-half to one third of its potential. This wasted potential growth is a significant economic loss for owners of forestland.

Understanding the many opportunities for profit and pleasure in Illinois forestry, however, should encourage those who own a forest in this state to develop a good forest management plan. District foresters in the Division of Forest Resources of the Illinois Department of Natural Resources and private consulting foresters can help develop one. Offices located through out the state are listed in Appendix B.

Objective of Forest Management

Why does one own a forest? One frequent answer to this question is that the forest came with the farm. Whether bought or inherited, however, this resource need not be wasted if the owner of a forest first establishes goals to guide its comprehensive management. One basic consideration is the owner's need for immediate versus long-term income. Others include the time and resources that the owner has for management activities; the owner's interests in complementary benefits, such as hunting, wildlife, recreation, and soil conservation; and opportunities for diversified farm income with alternative forest related crops, such as Christmas trees, shiitake mushrooms, fuelwood, or **biomass,** a short-rotation, energy-producing crop. These considerations will limit and structure the management plan.

Determining the Property Boundaries

The first step in developing a management plan is to know its location and size. Obtaining this information is generally not a significant problem for Illinois landowners because most of the state is laid out in a grid system known as a rectangular survey. Its divisions are townships and sections. Townships are 6 miles square and have 36 sections, with each section containing about 640 acres. (However, incomplete townships also exist.)

Aerial photographs and county plat books with accurately scaled diagrams showing boundaries and subdivisions are available at some libraries and many county agricultural offices and provide quick references for locating land areas and boundaries. Land forms, old fences, and comers can often be identified with these references. In the absence of these identifiable features, it is sometimes necessary to hire a registered land surveyor to reconstruct them, particularly for determining boundary lines. Determining specific features of interior areas may not require the services of a surveyor.

Getting a Visual Impression

In addition to helping determine property boundaries, aerial photographs are useful for understanding the topography and other characteristics of a forest. Both ridge tops and wet

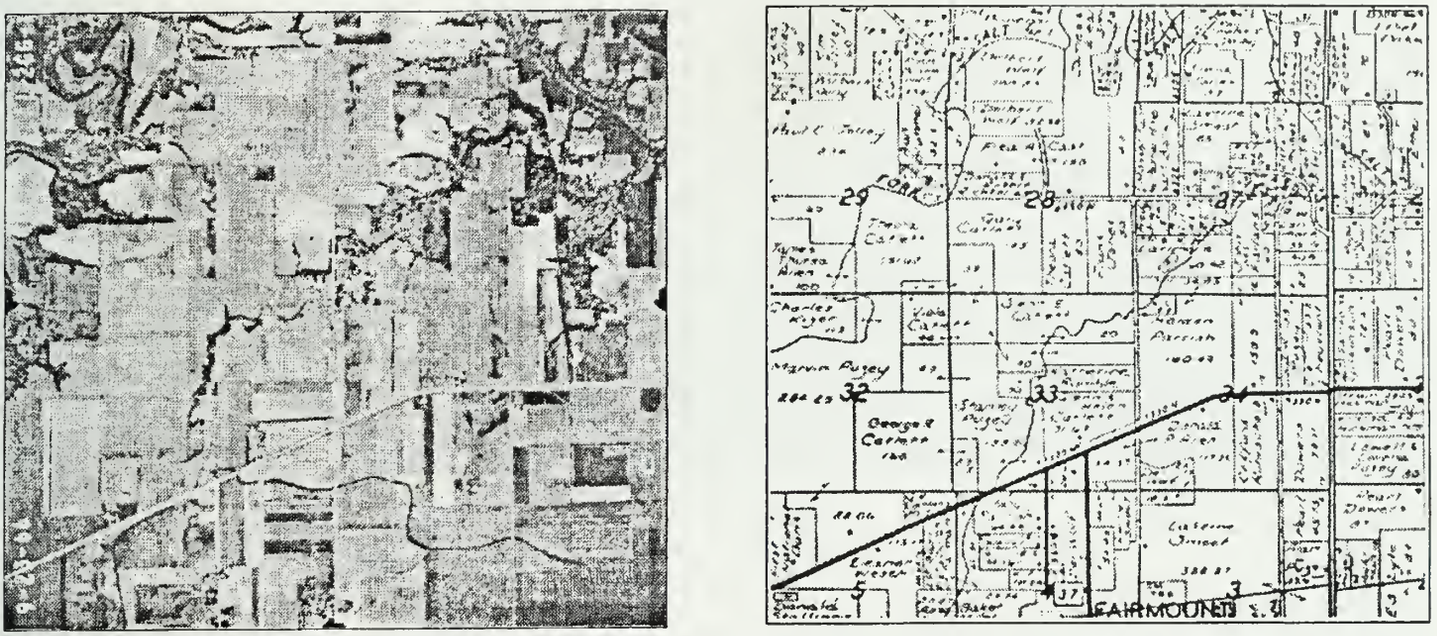


Figure 1. An aerial photograph (left) and a plat map (right) of an area complement each other. They should be compared for a maximum understanding of a site. (This map is reproduced with the permission of Rockford Map Publichers, inc.)

areas should be easy to determine on aerial photographs as well as drainage patterns and the resulting erosion. The locations of new or existing roads are also more apparent on them. Past and current aerial photographs help appraise existing conditions because they also reveal a forest's harvest and fire history. A good set of aerial photographs, therefore, is indispensable.

A ground reconnaissance, however, is also necessary. The presence of charred tree trunks discovered in a preliminary survey of a forest may substantiate its fire history. Decay and root rot could indicate heavy grazing. The absence of a particular size of tree in a forest may also indicate a period of grazing.

Knowing the history of a forest should help determine how past years have influenced the number of wildlife and consequently how to plan in order to maintain or increase it. For example, oak, a mast-producing tree, needs large openings with full sunlight to reproduce. A selective harvest that was not followed up by a **Timber Stand Improvement (TSI) Program** to hasten and improve tree growth could explain the condition of an undesirable wildlife habitat containing only a few oak seedlings and few large trees. A ground reconnaissance of this forest would reveal that TSI practices are needed.

These inventory data are critical for developing a forest management plan. The volume of wood in a forest may indicate whether or not a harvest should be conducted. The **condition class and species list,** which indicates the quality of the growing stock as good, medium, or poor, may be used to evaluate the need for thinning, pruning, brush removal, or other TSI practice.

Little diversity of species and age class in a woodlands also undesirable from the standpoint of wildlife-could be the result of an even-aged or a clear-cut system of forest **management.** This type of management can produce a pole stand by age 25. However, oak, a species that is difficult to regenerate in the understory, would have greater chance of reestablishing itself with this type of management. From a prior ground reconnaissance, it might be known that at an earlier age, this forest was dominated by briars, young trees, and other herbaceous plants, which provided an abundant food source and cover for wildlife. The edge effect created by even-aged management, nevertheless, would be very beneficial to wildlife because habitat diversity increases in the area between a forest and an open area.

Tree Scale: Doyle

Diameter Breast Height	Number of 16-foot logs							
	1/2	1	11/2	2	21/2	3	31/2	4
inches	contents in board feet							
12	20	30	40	50	60			
14	30	50	70	80	90	100		
16	40	70	100	120	140	160	180	19
18	60	100	130	160	200	220	240	26
20	80	130	180	220	260	300	320	36
22	100	170	230	280	340	380	420	46
24	130	220	290	360	430	490	540	60
26	160	260	360	440	520	590	660	74
28	190	320	430	520	620	710	800	88
30	230	380	510	630	740	840	940	104
32	270	440	590	730	860	990	1120	122
34	300	510	680	850	1000	1140	1300	144
36	350	580	780	970	1140	1310	1480	164
38	390	660	880	1100	1290	1480	1680	186
40	430	740	990	1230	1450	1660	1880	208
42	470	830	1100	1370	1620	1860	2100	232

Figure 2. Doyle Tree Scale

Taking an Inventory

The next important step in developing a management plan is taking a forest inventory, commonly referred to by foresters as "cruising." A cruise determines the species present, the number of trees by diameter and height classes, their vigor and condition, and the volume of wood present.

Primary forest products are most often measured in terms of cords, tons, or board feet. Understanding these concepts will be helpful in taking the inventory.

Cords. A cord is a volume measure of stacked wood. Rough forest products are cut and stacked to create a standard cord, which is 4 by 4 by 8 feet or 128 cubic feet of space. Because of the space between the pieces of stacked wood, a cord contains about 90 cubic feet of wood. Variations of this unit are "face cords," which contain individual pieces less than 4 feet long, usually 16 or 24 inches. Another variation is the "long cord," which contains pieces as long as 5 feet or longer. A long cord is 4 by 5 by 8 feet and represents 160 cubic feet. Firewood and pulpwood are usually sold in standard cords.

Tons. Unstacked wood and chips are sometimes sold by weight. On the domestic market, the 2,000-pound ton is the common unit.

Board feet. The board foot is the normal quantity designation for sawlogs and veneer logs-logs suitable for lumber and veneer. The specific **log rule** used will affect the estimate of the volume of wood present. The log rule is refined for application to tree or log measurements. When used to measure trees, the rule is called a tree scale, and the diameter measurement is at breast height (diameter breast height, DBH). The log rule is used to measure logs, the diameter in this case being from the small end and inside the bark (diameter inside bark, DIB). A handy slide rule with both tree scales and log rules is available from the Illinois Division of Forest Resources, 600 North Grand Avenue, West, Northwest Office Plaza, Suite 2, Springfield, Illinois 62706. Illinois Department of Natural Resources foresters and Illinois timber buyers use the Doyle Rule (Figure 2). Although the merchantable height is usually measured to a 10-inch top, forks, large branches, or other tree forms often limit this height (Figure 3).

Figure 3. One basic consideration for determining the value of a tree is the volume of wood present. Upper merchantability of this tree is limited by its size (shaded area A) and by its form (the fork at point B).

The procedures for taking and evaluating a forest inventory may seem complicated and confusing to those unfamiliar with them. Identifying the species present in a forest may also be a problem. As with many other professional chores, help is available. Consulting foresters work for a fee. State foresters, whose fees are paid by your taxes, are also available, but their resources are often overcommitted. These foresters may work for you, with you, or just guide you through any complicated sampling, measurement, tree identification, or interpretation of data. When you are determining the sampling procedure needed for your forest, they should be consulted to indicate the species to group, height classes, and diameter-breast-height classes. These data are important for determining the total volume and annual growth of a stand. In addition, foresters can make recommendations for suitable stocking levels and for properly scheduling TSI activities and harvesting.

They can provide information about the possible beneficial effects of a harvest on soil conservation, wildlife, and the recreational use of woodlands. For instance, both erosion and the siltation of streams can be reduced with proper harvesting techniques; and wildlife benefit, as noted earlier, when edge effects are formed by the creation of large openings near woodlands and when a number of den and mast-producing trees are left. Foresters can also tell owners of forests how the skid trails and roads created by harvesting can have recreational value when converted to hiking and ski trails and how harvesting permits more access to a forest for hunting and picnicking.

EDITOR'S NOTE: This article will be continued in the next issue of our newsletter.

GLOSSARY

advanced reproduction: young woody plants present before the harvest of a timber crop.

age: the number of growing seasons elapsed in the lifespan of a tree.

biomass: the total of all components of trees and shrubs roots, stems, branches, and leaves-measured in terms of weight.

bunching: skidding logs together to form a load for hauling by other equipment.

condition class and species list: a list of trees by species along with their stage of development, for example, "red oak, mature" or "red oak, medium growing stock."

cooperage: containers consisting of two round heads and a body, composed of staves, held together with hoops. The requirements for the materials and manufacture of slack cooperage, used for holding nonliquid products, are less stringent than the requirements for those of tight cooperage, used for storing liquids.

crook: a curve in a log.

cull: poor material that cannot be sold.

edge effect: zone of transition between a forest and an open area

even-aged management: system of forest management in which all trees are treated as if they were of the same age, usually within 10 to 20 years.

fuelwood: wood-usually of low quality and value that is to be burned for the production of heat and other forms of energy.

forestation: the natural or artificial establishment of a forest in an area where there is no forest,

ground reconnaissance: a review of conditions or developments in a given area made while walking through the area.

head bolt: material prepared for remanufacture into the top or endpieces of a barrel.

heel-in: to place young trees in a trench and cover their roots with soil for storage before planting.

intermediate cut: a harvest later than a pre-commercial thinning

but before the final harvest of a crop of trees.

lodging: the permanent displacement of a tree from the perpendicular usually caused by a combination of soggy soils and strong winds.

log rules: tables showing estimates of the amount of lumber that can be sawn from logs of specific dimensions. In Illinois the Doyle Log Rule and the International 1 /4-Inch Log Rule are the most common.

mast: collectively the flowers, fruits, and seeds produced by trees and consumed for food by wildlife and domestic livestock.

pulpwood: wood cut or prepared primarily for manufacture into pulp for subsequent manufacture into paper and allied products.

reforestation: the natural or artificial restocking of an area with forest trees.

release: to free trees from competing vegetation by chemical or mechanical methods.

sawlogs: logs that are to be manufactured into lumber, as opposed to veneer logs, cabin logs, and other types of logs.

sawtimber: trees that are managed for the production of lumber logs.

scale: to measure trees or logs in order to estimate their yield of forest products.

scalping: to remove competing vegetation, usually in preparation for tree planting.

seed tree system: a system of harvesting that in one operation removes all the mature trees except a few seed-producing trees to furnish seed for reestablishing a cut-over area.

selective harvest: method of harvesting in which individual trees or small groups of trees are cut at periodic intervals. Selection for this type of harvest is based on the physical condition or degree of maturity of the trees and results in an uneven-aged stand.

shelterwood system: a system of harvesting in which all the trees in an area are removed in two or more cuttings. This procedure allows for the establishment of new seedlings under the protection of the older trees.

short-boled: trees whose merchantable length is shorter than normal for a particular species or woodland.

stand: a group of trees that is distinguishable from other groups in a given area. A stand is usually of uniform size and condition and is called pure if 80 percent are of the same species. **stave bolt:** a piece of wood from which the sides of a barrel are manufactured.

stumpage: standing trees.

Timber Stand Improvement Program (TSI): a program of removing less desirable trees, vines, and shrubs to improve the stock and quality of a residual forest stand.

trim allowance: the additional 2 inches beyond the required length of a log that permits manufactured boards to be cut square and to exact even lengths.

tubelings: young trees grown individually in a controlled environment within small tubes to accelerate their growth before the trees are planted in a field.

veneer logs: high-quality, defect-free logs from which veneer is made.

Appendix A

Outline of a Suggested Forest Plan

Landowner's Name:

Acreage:

Permanent Index Number (if used in county):*

Location (Quarter, Section, Township, and County):

I am the owner of the property for which this plan has been prepared. The plan meets my requirements and has been prepared in accordance with Public Act 83 446. 1 will follow the recommendations to the best of my ability. If any changes in ownership or conditions of the forest are made, I will notify the Division of Forest Resources in the Department of Natural Resources within 30 days.

Please / /do / /do not forward this information to the Illinois Department of Revenue for land assessment purposes.

_____
Landowner

_____
Address

_____
Date

This plan approved by:

_____
District Forester

_____
Date

*Required only when the approved management plan certification is to be forwarded to the Illinois Department of Revenue.

(Source: Amended at 9 Ill. Reg. 14278, effective September 5,1985)

(Continued Next Page)

1a. Owner

1b. Manager (if applicable)

2a. Address

2b. Address

3. Property

a. Location (legal description)
b. Area (acres)
c. Tax Code # (if used in county)

4. Description of Land

Include topography, soils, species growing or planted, history and map of the property for:

a. Open Land (cropland, pasture, land without forest trees growing on it)
b. Forestland (at least 10 percent stocked)

5. Specific Information, Recommendations

a. Open Land (afforestation, reforestation) if applicable

(1) preplanting recommendations (planting stock, site preparation)
(2) spacing
(3) species and numbers required
(4) postplanting recommendations (care of the planted stock)

b. Forestland (established forest) if applicable

(1) volume/acre
(2) basal area/acre
(3) stocking/acre
(4) growth/acre
(5) harvest schedule
(6) cultural practices to meet forest need: planting, regeneration, species selection, and stocking

6. Soil and Water Conservation Goals-A statement of landowner's goals and practices to maintain or reduce soil erosion for meeting or exceeding the tolerable level established by the Department of Agriculture.

7. Wildlife Habitat Enhancement-Install compatible practices that will enhance potential wildlife habitat and meet the owner's objectives.

8. Protection Measures-Procedures to deal with insect, disease, and environmental problems. Where fire is a danger, firebreaks must be installed and maintained.

9. Financial Considerations-Discussion of specific costs involved in implementing open land and forest recommendations.

10. Other Considerations

Appendix B

Sources of Assistance for Illinois Forest Owners

Extension Forester
W-503 Turner Hall
1102 S. Goodwin Ave.
University of Illinois
Urbana, IL 61801
(217) 333-2777

State Forester Division of Forest Resources 600 N. Grand Ave.
West Springfield, IL 62706 (217) 782-2361

Illinois Consulting Foresters, Inc.
Current address and phone can be obtained from the offices listed above.

Forest Resources Districts in Illinois. The counties within each district are listed below. IL DNR District foresters can be contacted at the following addresses and telephone numbers:

District 1
Jo Daviess, Stephenson, Carroll, Whiteside

P.O. Box 6
Mt. Carroll, IL 61053
(815) 244-3655

District 2
Winnebago, Boone, Ogle, Lee, Dekalb

Castle Rock S. P.
R.R. 2
Oregon, IL 61061
(815) 732-6184

District 3
Rock Island, Henry, Mercer, Knox

P.O. Box 126
Cambridge, IL 61238
(309) 937-2122

District 4
Bureau, LaSalle, Stark, Marshall, Putnam

IVCC East Campus
Building 11
2578 East 350th Road
Oglesby, IL 61348
(815) 224-4048

District 5
Henderson, Warren, McDonough, Fulton

P.O. Box 335
Macomb, IL 61455
(309) 837-1124

District 6
Peoria, Tazewell, Woodford

P.O. Box 795
Pekin, IL 61554
(309) 347-5119

District 7
McHenry, Lake, Kane DuPage, N. Cook

Moraine Hills S. P.
914 S. River Rd.
McHenry, IL 60050
(815) 385-1644

District 8
Kendall, Grundy, S. Cook, Will, Kankakee

30071 S. State Route 53
P. 0. Box 69
Wilmington, IL 60481
(815) 423-6370

District 9
Livingston, McLean, Ford DeWitt, Piatt, Macon, Moultrie, Shelby

P.O. Box 320
Shelbyville, IL 62565
(217) 644-2411

District 10
Iroquois, Champaign, Vermilion, Douglas, Coles, Edgar, Clark, Cumberland

P.O. Box 139
Charleston,IL 61920
(217) 348-0174

District 11
Hancock, Adams, Pike, Brown

P.O. Box 477
Pittsfield,IL 62363
(217) 285-2221

District 12
Schuyler, Cass, Mason, Menard, Logan

P.O. Box 406
Havana,IL
(309) 543-3401

Appendix B

Sources of Assistance for Illinois Forest Owners

(continued)

District 13
Morgan, Scott, Greene,
Calhoun, Jersey

P.O. Box 170
Carrollton,IL 62016
(217) 942-3816

District 14
Sangamon, Macoupin,
Christian, Montgomery

PO. Box 603
Hillsboro,IL 62049
(217) 532-3562

District 15
Madison, Bond, Clinton,
Washington

P.O. Box 149
Carlyle,IL 62231
(618) 594-4475

District 16
St. Clair, Monroe,
Randolph

P.O. Box 21
Sparta,IL 62286
(618) 443-2925

District 17
Fayette, Effingham,
Marion, Clay

Stephen A. Forbes S.P.
R.R. 1,
Kinmundy,IL 62854
(618) 547-3477

District 18 Jasper,
Crawford, Richland,
Lawrence, Edwards,
Lawrence

P.O. Box 313
Olney, IL 62450
(618) 393-6732

District 19
Wayne, Jefferson,
Hamilton, White

P.O. Box 206
Fairfield, IL 62837
(618) 847-3781

District 20
Perry, Jackson,
Franklin, Williamson

P.O. Box 144
Murphysboro, IL 62966
(618) 687-2622

District 21
Saline, Gallatin, Pope
Hardin, Massac

Dixon Springs S. P.
R.R. 2
Golconda, IL 62938
(618) 949-3729

District 22
Union, Johnson,
Alexander, Pulaski

P.O. Box 67
Goreville, IL 62939
(618) 995-2568

ACQUIRING OR MAKING YOUR OWN TREE MEASUREMENT TOOLS

We've received numerous inquiries about where landowners can obtain tree scale sticks for determining tree diameters and height measurements. There are companies who sell tree scale sticks and a host of other forestry equipment that landowners may find useful in managing their woodlands. Two companies that come to mind are:

Ben Meadows Company
P.O. Box 80549
Atlanta, GA 30366
1-800-241-6401
W.W.Web address
www.benmeadows.com

Forestry Suppliers, Inc.
P.O. Box 8397
Jackson, MS 39284-8397
1-800-360-7788
W.W.Web address
www.Forestry-Suppliers.com

They would be happy to send you a catalog. Give them a call or visit their websites.

Virginia Tech University also has tree scale sticks for sale through their Forestry Extension office. Contact Jim Johnson, Extension Forester, 228 Cheatham Hall, Blacksburg, VA 24061-0324; phone 540/231-3330 or e-mail at *jej@vt.edu* for more information on price and availability.

If you're industrious, you can make a couple simple tools for measuring diameter and height with minimal effort.

If you think back to your geometry class in school, you'll remember that the volume of a cylinder is equal to the area of circle that makes up one of its ends times the cylinder's length. If the cylinder holds liquid (beer), its volume is measured in fluid ounces. If the cylinder is a log, its volume is measured in cubic feet of wood fiber. Cubic feet is a measurement that would be used if the log was going to be chipped up and made into paper. Very little waste results because the whole log is is converted to chips. But for logs that will be cut into dimension lumber, there is considerable wood fiber that is lost due to the kerf or sawdust that is created when the saw blade cuts through the log. Most of this .,waste" is not lost however. Sawdust is used in particle board or it is burned at the mill to generate electricity or heat. But, back to the lumber cut from the logs.

Volume tables have been developed for different regions of the country, which quickly estimate how many board feet of lumber can be cut from a tree of a given diameter and merchantable height (in 16- or 32-foot logs). An example of the Doyle Tree Scale (Volume Table) is given in Figure 2 on page 4 of the previous article in this newsletter.

One measurement you will have to take is the tree's diameter at 4.5 feet above the ground; referred to as diameter breast height or DBH. If you don't have a tree scale stick or a metal tree diameter tape, you can use a simple tape measure. At the 4.5 foot mark, wrap the tape around the tree's trunk and measure the circumference. Now, here comes the math. The formula for circumference is:

$$\pi \times \text{Diameter} = \text{Circumference}$$

$\Pi = 3.14$, so if you divide your circumference measurement by 3.14, this will give you the diameter of the tree in inches. If you don't want to continually divide on all your circumference measurements, you could make up a table that shows circumference in one column and in a corresponding column the appropriate diameter equivalent. Or if you're really industrious, you can purchase a blank cloth tape (that won't stretch) and you can mark increments equal to 3.14 inches on the tape, starting at a zero mark, with a permanent marker. Number each 3.14 increment consecutively, 1,2,3,4, etc. from the zero end of the tape. Each 3.14 inch increment would be equal to 1 inch of diameter when you use the tape to measure the tree's circumference. By doing this, you can read the diameter directly. If you really are a number cruncher, you can further divide the 3.14 increments into tenths (0.10) of an inch. If you want to keep track of .how your trees are growing in diameter, it's likely they will not be growing a full inch per year, so calibrating your tape to tenths of an inch is useful.

The other measurement you will have to take is a height measurement in 16- or 32-foot log lengths. In Illinois, we use 16 feet as the standard log length. To make your height measurement tool, you will need a yardstick, a 50- or 100foot tape, and a board or straight pole that measures 16 feet in length. Lean the 16-foot pole up against the trunk of a tree facing you. Now stretch the 100-foot tape out to the 66foot mark in a direction that allows you to still see the 16foot pole. Make sure this direction allows you to stand at the 66-foot mark on the same level as the base of the tree's trunk. You don't want to be standing higher or lower than the tree's base. If you are familiar with contour lines, you

want to be on the same contour (elevation) as the tree's base. Turn and face the tree. Hold the yardstick vertical at full arms length. Line the zero end of the yardstick up with the base of the tree at groundline. Without moving your head up and down, look to see where the top of the 16-foot pole cuts across your yardstick. Remember the corresponding measurement on your yardstick or have someone mark the spot on the yardstick for you. The increment distance between the zero end and mark on your yardstick represents one, 16-foot log when you are standing 66 feet away from the tree and you have the yardstick at full arms reach from you. Reproduce this increment three more times up the yardstick except for the increment between the third and fourth mark. Add an additional 1/4 inch to this increment. The fourth increment mark would represent four, 16-foot logs, the increment mark below this one three, 16-foot logs, and so forth. Mark these increments up from the zero end of the stick 1, 2, 3, and 4 with your permanent marker. You now have made a hypsometer or tree height measuring tool. To be accurate with it, you must be 66 feet away from the tree and the stick held vertical at full arm's reach. You can "calibrate" your stick for any distance from the tree and various reaches (or distance) from your eye. 66 feet or one chain is the standard distance used in forestry for taking height measurement. Tree scale sticks you buy will have the log height increments on them and are designed to be held 25 inches from your eye. If you have short arms, you're out of luck with a manufactured stick.

You can further refine the log height distance on your stick by dividing each increment in half. This would represent a half-log or an 8-foot log. A volume table lists diameters down one side and logs and half-logs across the top. Looking at the table on Page 4, find your diameter and move across the row until you find how many logs you've determined to be in your tree. Where these two intersect is the board foot volume for the tree. Mills in Illinois will take logs down to a top diameter of 10 inches inside the bark, so your challenge will be to determine where the 10-inch mark is up in the top log. Frequently in hardwoods, you will encounter a major fork in the trunk or some other defect which determines the tree's merchantable height long before you hit the 10-inch mark.

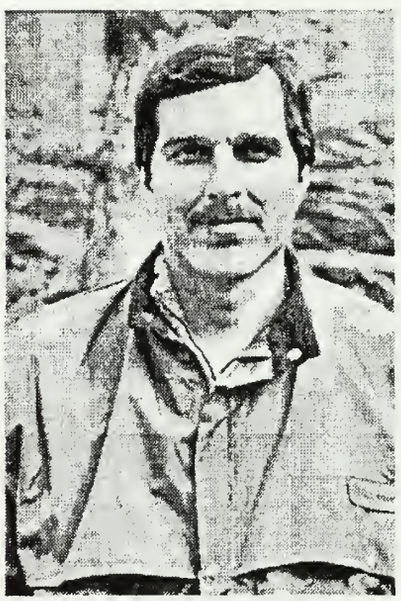
Now you're ready to go out and start taking measurements. Not industrious? ... maybe the $5.00 to $12.00 you'll spend for a tree scale stick is a good investment. If you buy one, make sure it is a Doyle Scale stick ... but that's another story.

The following article is reprinted from a manual entitled *Tim's* Tips. This manual is used in the Illinois Pro Logger Training Program as a teaching tool for professional loggers, however, it has equal application for landowners who use chain saws. The manual was developed by Tim Ard, president of Forest Applications Training, Inc. and Mike Bolin, University of Illinois Extension Forester. Mr. Ard is a nationally-known logging safety instructor and the instructor for Illinois' logger training program. Mr. Bolin coordinates Illinois' training program. If you have questions for Mr. Ard, he can be reached at his company's website:

wwwforestapps.com

Mr. Bolin can be reached by e-mail at:
m-bolin@uiuc.edu

If you would be interested in participating in a 2-day, hands-on training program for landowners on chain saw use and directional felling of timber, please contact Mr. Bolin at his e-mail address above. If there is enough interest, we will try to schedule a training program for interested landowners.



Tim Ard, logging instructor.

TIM'S TIPS

REDUCING DOWN TIME

Keeping your chain saw in perfect operating condition is key to reducing down time in your logging operation. During the workshops and visits to logging operations, I often find that saws are either unsafe to operate or are improperly maintained and tuned causing

saws to be unsafe, run inefficiently and even wear out prematurely.

There are many things you can do to maintain your saw(s). If you are unsure how to make a repair or tune a saw, it is best to take it to a dealer. However, if you understand what to look for you will better know when your saw needs the attention of a trained professional.

The following is a summary of basic maintenance steps. Some of these need to be done weekly and others need to be done daily. Please refer to your owner's manual for a list of daily and weekly maintenance schedules.

Procedures for Reducing Down Time (RDT):

1. **Air Filter** - Think of this as the chain saw's nose. If the filter is not clean, the chain saw cannot run efficiently. Air filters should be cleaned with soap and water and should be dry before putting them back on the saw. Consider having more than one filter so they can be rotated. Do not use cleaning agents on the filter, such as ether, which will destroy the seals. Do not use mixed mixed saw gas which will leave an oil residue that will collect dirt and fine sawdust particles.

2. **Screws and Bolts** - Always check screws, nuts and bolts; especially after running a few tanks of gas through a new saw.

3. **Starter Cord** - Inspect starter cord daily. There should be some free play in the spring when the cord is pulled out completely. The cord should not be frayed and the handle should not be broken.

4. **Flywheel and Pawls** - The flywheel often collects debris which can cause it to become unbalanced. The flywheel and pawls can be cleaned with a toothbrush and an ordinary bathroom cleaner such as 409. While the cover is off, it is a good idea to clean the wires of the ignition. When these get dirty, the vibration of the engine can cause the wire to break.

5. **Saw Chain** - Inspect chain for cracks and wear.

6. **Bar** - Clean the groove. Heat generated along the bar will cook oil and chips into the rail. This should be **removed** daily or it will tend to clog the bar making it difficult for the chain to pass over it and reduce effectiveness of the oiler. One way to help extend the bar life is to rotate the chains.

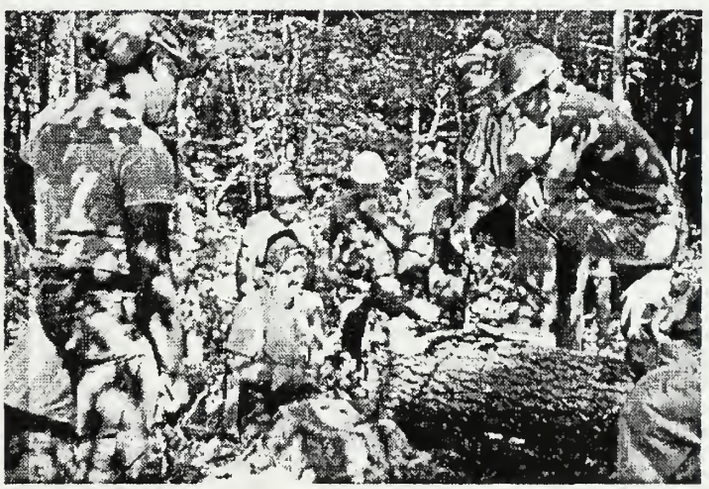
Your might consider owning three chains, which can be rotated on a daily basis. This will help the chain and bar wear at an even rate.

7. **Sprocket** - When the sprocket teeth at the end of the bar become sharp to the touch, they are worn out and should be replaced.

8. **Clutch, Drum, and Drive Sprocket** - The chain drive sprocket is made of case-hardened metal. If the fingernail can catch in the drive straps, the sprocket is probably worn out. The clutch is a spring clutch, which engages at approximately 3,000 RPM. The drum should be clean.

9. **Chain Catcher** - The chain catcher on the bottom of the saw must be in place to protect the operator from injury and the saw gas tank from rupture if a chain should be thrown off the bar.

10. **Chain Brake** - The chain brake stops the chain in the event of kickback. Most new brakes have an inertia function so the brake will engage even if the handle is not hit. The chain brake must be cleaned daily and can be checked by running the saw at full speed and activating the brake. The chain should stop almost instantly.



Tim Ard working with professional loggers in Illinois training program.

ILLINOIS TIMBER PRICES

ILLINOIS
U.S. DEPARTMENT OF AGRICULTURE
ILLINOIS DEPARTMENT OF AGRICULTURE
P.O. Box 19283, Springfield, IL 62794-9283
Phone: (217) 492-4295
AGRICULTURAL STATISTICS SERVICE

DIVISION OF FOREST RESOURCES
600 North Grand Avenue West
Springfield, Illinois 62706
Phone: (217) 782-2361

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

June 2, 1998

PRICES PAID ILLINOIS TIMBER PRODUCERS
NOVEMBER 1997 THROUGH FEBRUARY 1998

Winter sawtimber prices paid to Illinois timber growers generally showed slight upward trends for FOB Mill and stumpage compared to both the previous summer and winter. Of the timber buyers reporting volume of their 1997 operations, 35% indicated their volume was 500 thousand board feet or more.

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS

SPECIES	November 1996 - February 1997 Stumpage	F.O.B. Mill	May 1997 - August 1997 Stumpage	F.O.B. Mill	November 1997 - February 1998 Stumpage	F.O.B. Mill
SAWTIMBER - $ PER M BD. FT.						
Ash	170	300	150	320	150	330
Basswood	95	190	100	220	100	230
Beech	70	180	75	180	75	180
Cottonwood	40	140	60	150	55	160
Sweet Gum	85	170	75	180	60	170
Elm & Hackberry	60	140	75	170	70	170
Hickory	65	170	85	190	80	200
Soft Maple	95	170	95	220	100	240
Sugar Maple	140	300	140	300	150	320
Black Oak	150	250	160	300	160	320
Pin Oak	60	160	80	180	90	180
Red Oak	220	385	240	410	240	420
White Oak	200	340	220	380	230	400
Yellow Poplar	120	280	120	290	140	270
Sycamore	60	160	65	170	70	170
Black Walnut	330	510	340	510	310	490
Woods Run Bottomland	80	180	90	200	110	210
Woods Run Upland	140	270	130	270	180	330
FACE VENEER - $ PER M BD. FT.						
Red Oak	510	730	620	990	600	1,220
White Oak	1,100	1,900	1,000	1,800	1,120	1,840
Walnut	1,490	2,100	1,500	2,300	1,470	2,330
COOPERAGE - $ PER M BD. FT.						
White Oak	250	430	250	420	300	550
UNPEELED PULPWOOD - $ PER TON						
Ton	2.10	17.25	2.00	17.00	2.70	19.00

Timber Prices
November 1997 - February 1998
June 2, 1998

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
November 1997 - February 1998

PRODUCT	UNIT	Zone 1 Stumpage	Zone 1 F.O.B. Mill	Zone 2 Stumpage	Zone 2 F.O.B. Mill	Zone 3 Stumpage	Zone 3 F.O.B. Mill
1. Sawtimber				Dollars			
Ash	M bd. ft	70 -250	250-400	70 -250	300 -450	100-200	NA
Basswood	M bd. ft.	50-130	NA	40-150	160-300	80-150	200-350
Beech	M bd. ft.	50-100	150-200	40-100	190	65	180
Cottonwood	M bd. ft	30 - 90	100- 180	20-100	120-180	40- 50	120-200
Sweet Gum	M bd. ft.	50- 80	150-200	40- 75	175	50	NA
Elm & Hackberry	M bd. ft	30- 80	100-200	40-120	150-200	50-100	100-200
Hickory	M bd. ft.	40-100	150-230	50-120	150-330	50-100	100-250
Soft Maple	M bd. ft.	70-150	160-250	60 -180	150 -360	100-150	200-430
Sugar Maple	M bd. ft	80-250	160 -580	100-250	250-500	100-250	200-400
Black Oak	M bd. ft.	70-300	250-500	75 -260	190-500	80-300	100-300
Pin Oak	M bd. ft.	30-100	150-200	60-200	160-250	50-100	150-200
Red Oak	M bd. ft	100-350	310 -550	70-350	190-600	80-400	200-500
White Oak	M bd. ft	100-500	300-650	70-400	190-600	80-400	200-550
Yellow Poplar	M bd. ft.	80-250	150 -350	40-210	160-300	150	400
Sycamore	M bd. ft	30 - 80	100-200	40-120	130 -220	50-100	150-200
Black Walnut	M bd. ft	50-500	200 -650	70-400	300-500	200-600	450-700
Woods Run Bottomland	M bd. ft.	70-200	160-300	50-200	140-400	50-200	230
Woods Run Upland	M bd. ft	100-300	250 -450	80-270	140-500	140-300	330 - 350

STATEWIDE

		Stumpage	F.O.B. Mill
2. Face Veneer			
Red Oak	M bd. ft.	120-2,000	750-2,500
White Oak	M bd. ft.	500-2,000	650-3,000
Walnut	M bd. ft	250-3,500	600-3,500
3. Cooperage			
White Oak	M bd. ft.	200- 450	450- 630
4. Pulpwood			
Unpeeled	Ton	2.00- 3.00	18.00 - 20.00

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	96
Scribner	2
International	2

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rates Reported
		$/M bd. ft.
Zone 1	18	110
Zone 2	20	100 -200
Zone 3	28	100 -300
ILLINOIS	23	70 -300

VOLUME OF 1997 OPERATIONS

Size in (000) bd. ft.	Zone 1 %	Zone 2 %	Zone 3 %	All %
1 -100	22	28	56	38
100 -500	34	22	28	27
500 -1,000	22	11	-	9
1,000 - 3,000	22	22	5	15
3,000 +	-	17	11	11

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer' used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

MARKED TIMBER SALES - NOVEMBER 1997 - FEBRUARY 1998

	STATEWIDE STUMPAGE*
Woods Run Upland	$150-$256/M bd. ft.
Woods Run Bottomland	Insufficient Data

*Prices supplied to District Foresters by seller, may include some veneer.

Garry D. Kepley, State Statistician
Tom Pordugal, Rick Kestle, Agricultural Statisticians

"Printed by authority of the State of Illinois," 5/1/98, 1,700, 1524

Cooperative Extension Service
University of Illinois at Urbana-Champaign

ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

Volume 2, 1998 No. 35

IN THIS ISSUE

Indian Pipe & Quail Illustrations by Ned Smith

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave. Urbana, IL 61801.

The following article is reprinted from companion Ohio State University Extension Service publications entitled "*Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland*" and "*Herbicides Commonly Used for Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland*" by Dr. Randall B. Heiligmann. The article contains revisions to reflect herbicides licensed for use in Illinois.

HERBICIDES USED IN TIMBER STAND IMPROVEMENT

Timber stand improvement (TSI) is the removal or deadening of undesirable vines, shrubs, and trees in a forest stand. It is a major forest management tool to help woodland owners achieve their management objectives. Once ownership objectives are identified, the less desirable trees can be removed to favor the growth of those that better satisfy the owner's objectives (e.g., quality timber, wildlife habitat, etc.). At the same time, woody plants that pose a threat to human health or safety, such as poison ivy, can be eliminated. Several timber stand improvement techniques can also be used to create standing dead trees to provide various types of wildlife habitat such as perches, dens, and foraging trees for animals and birds.

Timber stand improvement can be accomplished by cutting the less desirable woody vegetation or by killing it in place. Undesirable trees with commercial value can be sold, making the timber stand improvement operation an income-generating forest man-

agement activity. Some undesirable trees may be used for lumber, firewood or other products. Grapevines might be used for wreaths. In most timber stand improvement operations, however, the undesirable vegetation is of little economic value or use. Although it can be cut and left in the woods, the safest and most efficient way to remove undesirable vegetation is often to kill the trees, shrubs, or vines and leave them standing.

The most effective method for killing standing trees, shrubs, and vines will usually involve the use of an herbicide. For those who prefer not to use pesticides, cutting, frilling, or girdling can be used without herbicides. However, physical methods of deadening standing trees that do not use herbicides are generally less dependable (particularly with hard-to-kill species such as red maple, hickories, and dogwoods) and require longer to be effective than those that incorporate herbicides into the treatment.

Selected Timber Stand Improvement Techniques

The remainder of this article discusses when and how to use four commonly applied timber stand improvement techniques: frilling or girdling, spaced cuts or injection, basal bark spraying, and cut stump application. Tables 1-6 present herbicides commonly used with each method, along with brief recommendations for their use. These recommendations are not complete instructions; they are provided to help you select among the herbicides. It is essential that you read the entire label before using any herbicide. The label contains complete instructions for use, along with other valuable information such as personal and environmental safety considerations and procedures. Many of the labels also list information about the effectiveness of the herbicide in controlling different species of trees, shrubs, and vines. All herbicides are not equally effective in controlling different species.

Herbicides, like all pesticides, are approved (labeled) for specific uses by the Environmental Protection Agency. These approved uses are listed and described on the pesticide's label. The herbicides listed in Tables 1-6 were appropriately labeled at the time of this publication (Winter 1998-99) in Illinois. Because pesticide labeling may change at any time, you should verify that a particular herbicide is still labeled for your intended use.

FRILLING OR GIRDLING • Girdling and frilling are methods of killing standing trees that may be done with or without an herbicide.

Girdling involves cutting a groove or notch into the trunk of a tree to interrupt the flow of sap between the roots and crown of the tree (Figure 1). The groove must completely encircle the trunk and should

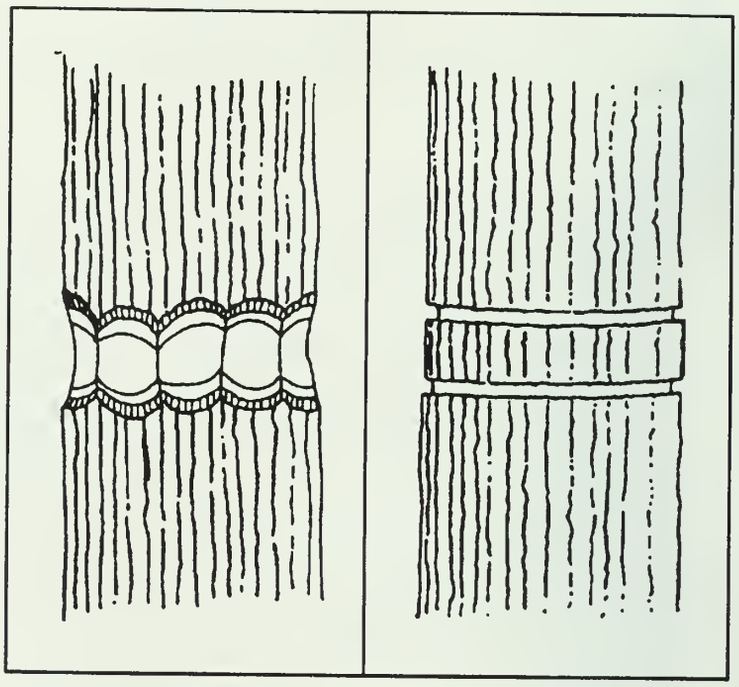


Figure 1. Girdling

Figure 2. Two horizontal cuts, no herbicide.

penetrate into the wood. The depth and the width of the girdle will depend upon the size of the tree. Small trees (under 5 inch trunk diameter) can be controlled by girdles 0.5 to 1.5 inches deep and 1 or 2 inches wide, while larger trees may require the girdle to be 1-2 inches deep and 6-8 inches wide. Girdling can be done with an ax, hatchet, or chain saw. When done with an ax or hatchet, the girdle is made by striking from above and below along a line around the trunk so that a notch of wood and bark is removed. When a chain saw is used to girdle, two horizontal cuts between 2 and 4 vertical inches apart are usually made completely around the tree when no herbicide is used (Figure 2) and one horizontal cut is made completely around the tree when herbicide is used (Figure 4).

Frilling is a variation of girdling in which a series of downward angled cuts are made completely around the tree, leaving the partially severed bark and wood anchored at the bottom (Figure 3). Frilling is done with an ax or hatchet.

By themselves, girdling and frilling are physical methods to deaden trees that require very little equipment and may be done without herbicides. Both techniques require considerable time to carry out, particularly with an ax or hatchet. Girdling with a chain saw is much faster. The effectiveness of girdling and frilling depends on the tree species and on the size and completeness of the girdle or frill. To be

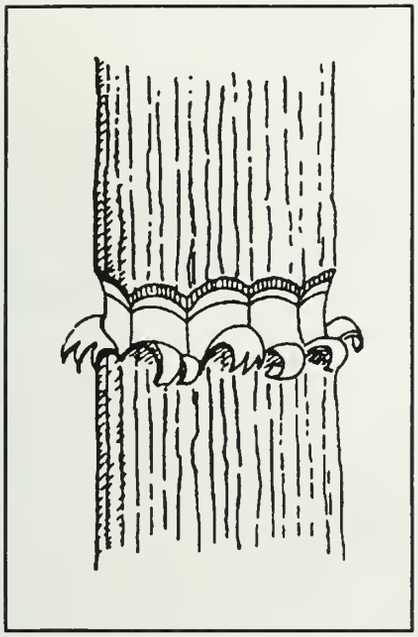


Figure 3. Frilling

effective, girdles and frills must completely encircle the tree. Because frills can heal-over more easily, girdling is usually more effective.

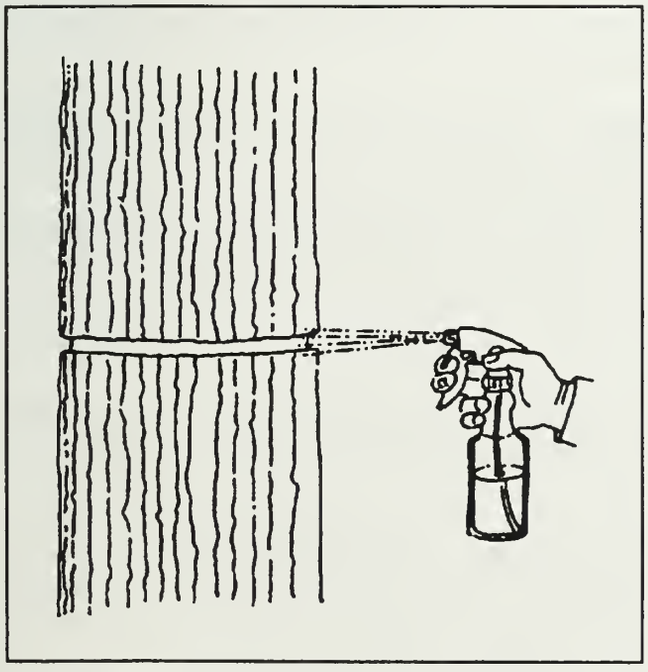


Figure 4. A single horizontal cut with herbicide applied.

The effectiveness of both girdling and frilling, however, can be increased by also using herbicides (Table 1). With frilling and girdling, water soluble forms of herbicides are most commonly used to get maximum movement of herbicide within the plant. When using water-soluble herbicides, the herbicide/water mixture is commonly applied by squirting it on the girdle or frill until the cut surface is wet. Hand-held, pint or quart spray bottles, such as those available at local garden stores, are ideal for applying herbicide to the girdle (Figure 4). Again, note that a single, rather than double chain saw girdle is used when a water soluble herbicide is to be applied.

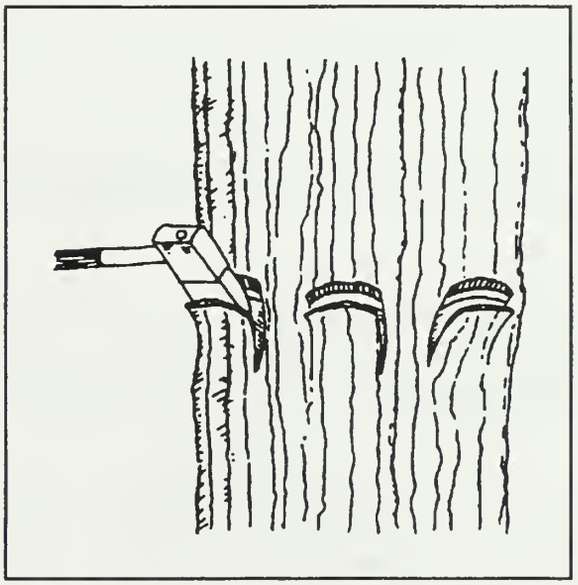


Figure 5. Spaced cuts made with hypo-hatchet, which injects a pre-measured amount of herbicide into each cut.

Exceptions to the above recommendation of using a water soluble herbicide for girdling and frilling are the commonly-used forestry herbicides that contain the ester formulation of 2,4-D + 2,4-DP, such as Patron 170 and Super Brush Killer2. They are labeled for use with frilling in an oil carrier, and the recommendation is to fill the frill with the mixture. They are commonly applied with a backpack or hand-held, hand-pumped sprayer.

SPACED CUTS-TREE INJECTION • Tree injection introduces a herbicide into the undesirable tree through cuts made around the trunk of the tree with an ax, hatchet, or tree injector (Figure 5). The procedure can be visualized as a discontinuous frill with a small amount of herbicide placed in each cut. With an ax or hatchet, non-overlapping horizontal cuts penetrating into the sapwood (the outer area of lighter-colored wood in the stem cross section) are made

completely around the tree. Cuts are approximately 2 inches long and are spaced with their edges 1 to 3 inches apart, depending on tree species and specific herbicide being used. A small amount of herbicide is then placed in each cut (Table 2). This can be done conveniently with a pint or quart spray bottle (such as those available at garden stores). The amount of herbicide to be placed in the cut is specified on the herbicide label, but is generally 1 to 2 milliliters. There are also various tree injectors available including the "hypo-hatchet," (Figure 5) which is a hatchet with a reservoir constructed to inject herbicide when it is struck into the tree.

Tree injection is generally more effective than mechanical girdling or frilling without herbicide because of the use of a herbicide. However, on difficult-to-control species, such as red maple, hickories and dogwoods, a continuous frill or girdle with herbicide may be necessary to obtain acceptable control. For this reason, many commercial TSI (timber stand improvement) contractors routinely use a single chain saw girdle with herbicide on all species to maximize effectiveness.

As with most of the herbicides suggested for use with girdling and frilling, the herbicides for tree injection are mostly water-soluble materials that move vertically and horizontally within the tree to complete a chemical girdle.

BASAL-BARK TREATMENTS • Basal spraying, or basal-bark as it is sometimes referred to, is a technique to deaden small trees, shrubs, and occasionally vines by spraying the lower 12 to 18 inches of the trunk with an herbicide (Figure 6). The intent is for the herbicide to penetrate the bark and kill the tree and any basal buds that might sprout. Herbicides used for basal spraying are generally applied in oil carriers (Table 3). The technique is effective on trees less than 4 to 6 inches in diameter. As bark becomes rougher and thicker, the techniques becomes less effective.

Care must be taken when the herbicide is applied to minimize the amount that runs into the soil. This is important not only from an environmental quality standpoint, but also to avoid damaging non-target trees. The roots of trees often extend well out beyond their crowns. It would not be at all unusual for the roots of an adjacent desirable tree to extend below the trunk of a tree being basal sprayed. If excess amounts of herbicide were applied to the treated tree, the adjacent desirable tree could absorb the herbicide and be killed or seriously damaged.

Basal-bark treatments can be made throughout the year except when the bark is very wet or covered with ice or when the depth of snow prevents application. However, dormant season application may be desirable to reduce drift complaints.

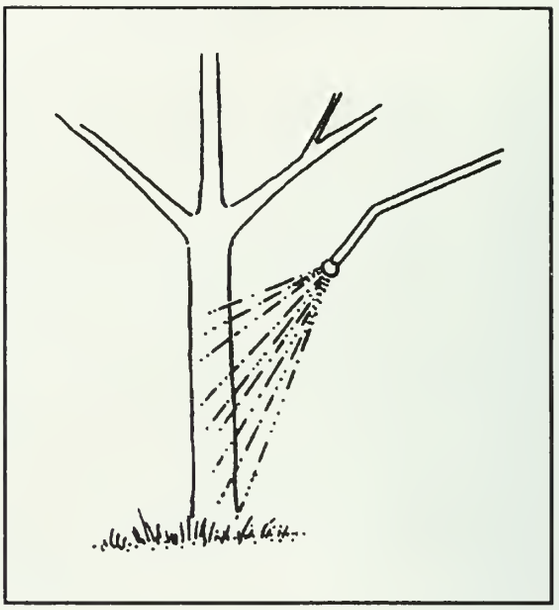


Figure 6. Basal Bark Spraying

Because of their persistence, the amount of time between basal-bark application and the planting of new trees in the vicinity of the treated tree must be considered. The products fall into two time restriction categories:

Wait 30 days: Monterey Brush Buster; Riverdale Patron 170; Tur,f Weed, and Brush Control.

Wait 3-6 months: Banvel; Chopper; Chopper RTU; Clarity; Garlon 4; Pathfinder II; Stalker; Velpar DF; and Velpar L .

Refer to Table 3 for rate recommendations for these herbicides.

Oil-soluble, usually ester, formulations of herbicides are applied in diesel oil or kerosene to penetrate the bark. Penetrating oils with less offensive odors are available, but they are more expensive. Standard basal-bark treatments are applied around the lower 12 to 15 inches of the stem and basal buds that might sprout, including the root collar and exposed roots. Conventional basal-bark technique uses 1 to 3 percent herbicide in oil, while low-volume basal-bark technique uses 20 to 30 percent herbicide in oil. Smaller bands (broad band or thin line) with a higher concentration of herbicide in oil can be effective on many species. Follow instructions on the

herbicide label.

CUT SURFACE • A number of different cut-surface treatments are used to control trees having thick bark or trunks greater than 5 inches in diameter. When a tree or vine is cut, there is a high probability that the stump will sprout. When this is undesirable, the sprouting can be eliminated by treating the cut stump with an herbicide. Herbicide can be applied to the stump in many ways, the most common being to spray with a backpack or hand-held sprayer.

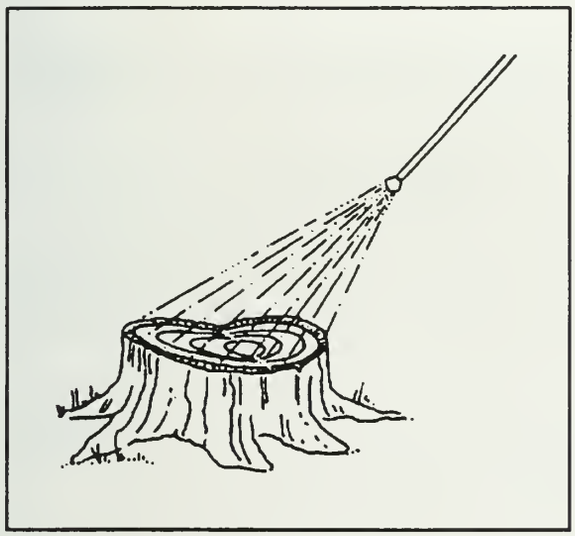


Figure 7. Cut stump surface treatment.

How much of the stump needs to be treated depends on the formulation of herbicide used. Many of the herbicides labeled for cut stump application are water soluble (Table 4). With these materials it is not necessary to treat the entire stump. The critical area of the stump that must be treated to prevent sprouting is the sapwood and bark of the stump's cut surface (Figure 7). Stump treatment with water soluble herbicides must be done immediately after cutting the tree or vine in order to be effective. If treatment is delayed, adequate downward movement of the herbicide will not occur and sprouting will not be eliminated.

Some herbicides labeled for cut stump application are formulated to be mixed with oil (Table 5). These materials do not move readily within the plant, but penetrate the bark. To be effective in suppressing stump sprouting, the entire stump, particularly the bark and exposed roots, must be thoroughly sprayed (Figure 8). Timing is less critical with these materials because they are not so dependent on movement downward from the cut surface to distribute the herbicide. In situations where immediate treatment of stumps is not possible, an herbicide in an oil carrier should be used rather than one in a water carrier.

Treatment with an oil-carried herbicide is also recommended in the spring when treating species that exhibit a spring "sap flow," such as the maples (*Acer*), grapes (*Vitis*) and ironwoods (*Ostrya*). Water-carried herbicides will usually not be adequately absorbed to be effective during the spring "sap-flow."

Again, persistence of the chemical places these herbicides into three time-restrictive categories for the planting of new trees in the vicinity of the treated tree(s). For treating cut stumps the categories are:

No residual/plant immediately: Accord; Glyfos; Honcho; Rascal; Rodeo; Roundup Pro; Roundup Original; Roundup Custom; and Roundup Ultra.
Wait 30 days: BrushKil Poison Oak & Ivy; Dragon Super Brush Killer2; Monterey Brush Buster; Pathway; Riverdale Patron 170; Turf, Weed, and Brush Control.
Wait 3-6 months: Arsenal A.C.; Banvel; Chopper; Chopper RTU; Clarity; Garlon 3; Garlon 4A; Redeem; Riverdale Veteran CST; Stalker; Tordon 101; and Tordon RTU.

Refer to Tables 4-6 for rate recommendations for these herbicides.

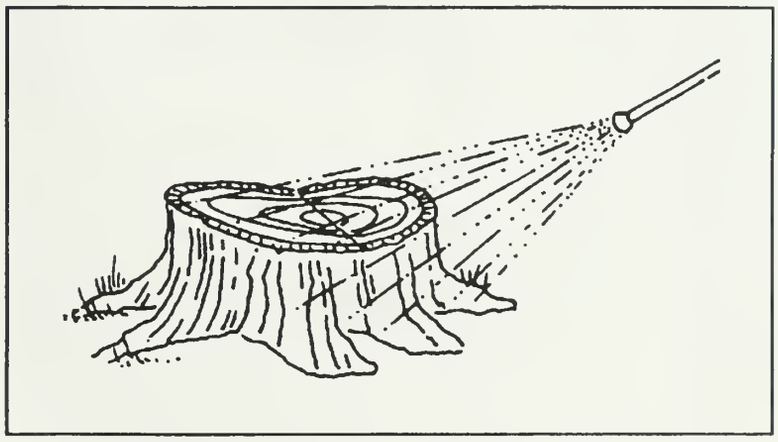


Figure 8. Spraying the cut stump and root collar area.

Table 1 Herbicides commonly used when girdling or frilling undesirable trees in a timber stand improvement operation. Column one contains the common names of frequently used herbicides, column two contains one or more examples of commonly used brands along with their manufacturers or distributors, and column three contains a brief summary of use recommendations.

Common Names	Brand Names (Manufacturer or Distributor)	Recommendations
Dicamba	Veteran CST (Riverdale Chem. Co.)	Make continuous cut or series of overlapping cuts and spray or paint cut surface of girdle or frill with undiluted Veteran CST.
	Banvel or Clarity (BASF)	Make continuous cut or series of overlapping cuts and spray or paint cut surface of girdle or frill with 1 part Banvel or Clarity mixed with 1 to 3 parts water.
Glyphosate	Accord or Rodeo (Monsanto)	Spray or paint Accord or Rodeo on the cut surface of girdle or frill at a rate of 1 ml for each 2 inches of trunk diameter, either undiluted or mixed with water at a concentration of no less than 25 percent. For best results, application should be made during periods of active growth and full leaf expansion.
	Glyfos (Cheminova) or Honcho, Roundup Pro, or Rascal (Monsanto)	Spray or paint Glyfos, Honcho, Roundup Pro, or Rascal on the cut surface of girdle or frill at a rate of 1 ml for each 2 to 3 inches of trunk diameter, either undiluted or mixed with water at a concentration of no less than 50 percent. For best results, application should be made during periods of active growth and full leaf expansion.
Imazapyr	Arsenal Applicators Concentrate (American Cyanamid)	Mix 6 ounces of Arsenal Applicators Concentrate with one gallon of water and spray or brush the solution on frill or girdle (thoroughly wet). If a discontinuous frill is used, there should be no more than 2 inches between cut edges. Or, mix 2 quarts of Arsenal Applicators Concentrate with no more than 2 quarts of water and spray or brush the solution on frill or girdle (thoroughly wet). If a discontinuous frill is used, there should be at least 1 cut for every 4 inches diameter breast heigh (DBH).
	Chopper (American Cyanamid)	Mix 8 to 12 ounces of Chopper in one gallon of water, diesel oil, or penetrating oil. Make cuts through bark completely around tree with no more than 2 inch intervals between cut edges and spray or brush solution into each cut until thoroughly wet.

Tables 1-6 were adapted with permission from "Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland," F-45-97, Ohio State University, and reflect herbicides that are registered for use in timber stand improvement operations in Illinois.

Table 1, Continued

Picloram + 2,4-D	Tordon RTU or Pathway (DowElanco)	Spray or paint a complete girdle or frill with undiluted Tordon RTU or Pathway. Apply enough herbicide to wet the cut surface completely.
	Tordon 101 Mixture* (DowElanco)	Spray or paint a complete girdle or frill with Tordon 101 Mixture diluted 1:1 with water. Apply enough of the spray mixture to completely wet the cut surface.
Triclopyr	Garlon 3A (DowElanco)	Wet the cut surface of a complete girdle or frill with Garlon 3A, undiluted or diluted 1:1 with water.
	Redeem (DowElanco)	Make a single girdle through the bark completely around the tree. Wet the cut surface with diluted or undiluted solution of Redeem in any season except during heavy sap flow.
2,4-D + 2,4-DP Ester	Patron 170 (Riverdale Chem. Co.)	Fill frill with mixture equivalent to 3.8 to 5.1 ounces of Patron 170 in 1 gallon of oil.
2,4-D + 2,2,4-D	Turf, Weed and Brush Control (Riverdale Chem. Co.)	Mix 3 to 4 gallons of Turf, Weed and Brush Control with 100 gallons of oil. Make a frill of overlapping "V" shaped notches in a continuous ring around the trunk near the base of trees 5 inches DBH or larger, but do not remove the chips. Pour as much product mixture into the frill as it will hold. Treatment may be made in any season.

* Restricted use—must be a certified pesticide applicator to purchase or use.

Table 2 Herbicides commonly used when injecting undesirable trees in a timber improvement operation. Column one contains the common names of frequently used herbicides, column two contains one or more examples of commonly used brands along with their manufacturers or distributors, and column three contains a brief summary of use recommendations.

Common Names	Brand Names (Manufacturer or Distributor)	Recommendations
Glyphosate	Accord or Rodeo (Monsanto)	Inject the equivalent of 1 ml of Accord or Rodeo for each 2 inches of trunk diameter, full strength or diluted with water to a concentration of not less than 25 percent. Injections should be evenly spaced around the tree. With larger trees, a continuous frill or girdle is more effective than spaced injections. Best results will be obtained if treatment is made during periods of active growth and after full leaf expansion.
	Roundup Pro, Honcho, or Rascal (Monsanto), or Glyfos (Cheminova)	Inject the equivalent of 1 ml of Roundup Pro, Glyfos, Honcho, or Rascal for each 2 or 3 inches of trunk diameter, full strength or diluted with water to a concentration of not less than 50 percent. Injections should be evenly spaced around the tree. With larger trees, a continuous frill or girdle is more effective than spaced injections. Best results will be obtained if treatment is made during periods of active growth and after full leaf expansion.
	EZ-Ject (Monsanto)	Inject one capsule every 4 inches evenly around the tree trunk below all major branches. For stems less then 2.5 inches DBH, inject one capsule per stem.
Hexazinone	Velpar L (DuPont)	Inject 1 ml of undiluted Velpar at 4 inch intervals around trunk circumference. Most effective if used during summer.
Imazapyr	Arsenal Applicators Concentrate (American Cyanamid)	Mix 6 ounces of Arsenal Applicators Concentrate with 1 gallon of water and inject 1 ml of solution at each injection site around the tree with no more than 1 inch between cut edges. Or, mix 2 quarts of Arsenal Applicators Concentrate with no more than 2 quarts of water and inject 1 ml of solution at each injection site with at least one injection cut for every 4 inches of tree diameter at DBH (41/2 feet above ground).
	Chopper (American Cyanamid)	Mix 8 to 12 ounces of Chopper in 1 gallon of water, diesel oil, or penetrating oil. Inject 1 ml of solution in each cut with no more than 1 inch between cut edges.

Tables 1-6 were adapted with permission from "Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland," F-45-97, Ohio State University, and reflect herbicides that are registered for use in timber stand improvement operations in Illinois.

Table.2, continued

Picloram+2,4-D	Tordon RTU or Pathway (DowElanco)	Inject 1 ml of either undiluted Tordon RTU or Pathway around the tree trunk at intervals of 2 to 3 inches between edges of the injector cuts. Treatment can be done at any time during the year except for species which have a spring sap flow. Those species, such as the maples and grapevines, should not be treated during the flow period. Difficult to control species, such as dogwood, hickory, and sugar maple, may require edge to edge injection, essentially a complete frill.
	Tordon 101 Mixture (DowElanco)*	Inject 1/2 ml of undiluted or 1 ml of diluted (1:1 with water) Tordon 101 Mixture through the bark at intervals with 3 inches between edges of the injection cut. Injections should completely surround the tree.
Triclopyr	Garlon 3A or Redeem (DowElanco)	Inject 1/2 ml of undiluted or 1 ml of diluted (1:1 with water)Garlon 3A or Redeem through the bark at intervals of 3 to 4 inches between centers of the injection cut.
2,4-D	Weedestroy AM-40 or 2,4-D Amine IVM (Riverdale Chem. Co.)	In injections spaced 2 inches apart (edge to edge) around the trunk, inject 1 ml of undiluted Weedestroy AM-40 or 2,4-D Amine IVM. Injections must penetrate the bark. For difficult to control species such as hickory, dogwood, red maple, and blue beech, the label recommends spacing injections 1 1/2 inches apart. Such species may require edge-to-edge injections, while other species may be controlled with wider than recommended injections or the use of a diluted solution. For best results, injections should be made during the growing season, May 15 through October 15. Product may be diluted with water when desirable.
	2,4-D Amine 4 (Albaugh, Wilfarm or Setre); Weed Rhap A-4D (Setre); Weedar 64 (Rhone-Poulenc); Tenkoz Amine 4 (Tenkoz); Sentry 2,4-D Amine 4 (United); Hi-Dep Broadleaf Herbicide and Hi-Dep IVM (Gordon's); Clean Crop Amine 4 2,4-D Weed Killer (Platte)	Inject 1 to 2 ml of undiluted 2,4-D Amine 4, Weed Rhap A-4D, Weedar 64, Tenkoz Amine 4, Sentry 2,4-D Amine 4, Hi-Dep Broadleaf Herbicide, Hi-Dep IVM, or Clean Crop Amine 4 2,4-D Weed Killer through the bark, using one injection per inch of trunk DBH. Injections should be evenly spaced and made as near the root collar as possible. Injections may be made in any season, but are most effective during the growing season.

* Restricted use—must be a certified pesticide applicator to purchase or use.

Table 2, continued

2,4-D	2,4-D LV4 (Albaugh or Wilfarm); Lo-Vol 4 (Tenkoz); See 2,4-D (Albaugh); See 2,4-D LV4 (Terra); Sentry 2,4-D LV4 (United);	Inject 1 ml undiluted 2,4-D LV4, Lo-Vol 4, See 2,4-D, See 2,4-D LV4, Sentry 2,4-D LV4, 1 to 2 inches apart completely around the tree and close to the base. Injections may be made in any season, but are most effective during the growing season.
	Solution Water Soluble Amine or Solution Water Soluble IVM (Riverdale Chem. Co.)	Dissolve a 2 lb 13 oz packet of Solution Water Soluble Amine or Solution Water Soluble IVM in 1 1/2 gallons of water. Inject .75 ml spaced at 1 to 2 inches apart completely around the tree. Injections may be made in any season, but are most effective during the growing season.
	2,4-D LV6 Ester (Riverdale Chem. Co.)	Inject .7 ml of undiluted 2,4-D LV6 Ester 1 1/2 to 2 inches apart completely around the tree and close to the base. Injections may be made in any season, but are most effective during the growing season.
	2,4-D LV4 Ester (Riverdale Chem. Co.)	Inject 1 ml undiluted 2,4-D LV4 Ester 1 1/2 to 2 inches apart completely around the tree and close to the base. Injections may be made in any season, but are most effective during the growing season.
	2,4-D LV4 (Setre) 2, 4-D 6 Amine (Riverdale Chem. Co.) Low-Vol 6 (Tenkoz) 2,4-D LV6 (Wilfarm) Sentry 2,4-D LV6 (United)	Inject .7 ml of undiluted 2, 4-D 6 Amine, Low-Vol 6, 2,4-D LV6, or Sentry 2,4-D LV6 1 to 2 inches apart completely around the tree and close to the base. Injections may be made in any season, but are most effective during the growing season.
	Cornbelt 4 Lb. Amine (Van Diest) Cornbelt Hi-Pen (Van Diest) Formula 40 (Rhone-Poulenc)	Inject 1 to 2 ml of Cornbelt 4 Lb. Amine, Cornbelt Hi-Pen, or Formula 40 through the bark at intervals of 1 to 3 inches near ground level. Continuous cuts around the trunk often provide improved control. Treatment can be made in any season; however, effectiveness may be less during winter months.
MSMA	MSMA Turf (Turfgo)	Inject 1 ml of undiluted MSMA Turf evenly spaced around the trunk below waist height. Make one injection per each 2 inches of diameter in trees less than 8 inches DBH, or one injection per inch for trees larger than 8 inches DBH.

Table 3 Herbicides commonly used when basal spraying undesirable trees in a timber stand improvement operation. Column one contains the common names of frequently used herbicides, column two contains one or more examples of commonly used brands along with their manufacturers or distributors, and column three contains a brief summary of use recommendations.

Common Names	Brand Names (Manufacturer or Distributor)	Recommendations
Imazapyr	Chopper or Stalker (American Cyanamid)	Mix 8 to 12 ounces of Chopper or Stalker in one gallon of diesel oil or penetrating oil. To control woody plants with stems up to 4 inches dbh spray to wet the lower 12 to 18 inches of the plant stem with the mixture. Do not over apply causing dripping or puddling.
	Chopper RTU Basal and Cut Stump (American Cyanamid)	For stems less than 4 inches dbh, apply undiluted Chopper RTU to the lower 12 to 18 inches of stem. Do not cause dripping or puddling.
Triclopyr	Pathfinder II (DowElanco)	Spray undiluted Pathfinder II on the basal (lower) stems of the brush or trees to be controlled in such a way as to thoroughly wet the entire circumference of the bottom 12 to 15 inches of the stems, including the root collar area, but not to the point of runoff. Application may be made at any time, including the winter months, except when snow or water prevent spraying to the ground line.
	Garlon 4 (DowElanco)	Conventional Basal Bark Treatment: Mix 1.3 to 6.4 ounces of Garlon 4 with enough oil to make a gallon of mixture, and spray the entire circumference of the lower 12 to 15 inches of the woody stems until runoff is noted at the ground line using a low pressure (20-40 psi) backpack or power sprayer.
	Garlon 4 (DowElanco)	Low Volume Basal Bark Treatment: Mix 26 to 38 ounces of Garlon 4 with enough oil to make a gallon and spray to wet the entire circumference of the lower 12 to 15 inches of the woody stems, including the root collar area, with a backpack or knapsack sprayer using low pressure (20 to 40 psi) and solid cone or flat fan nozzle. Do not spray to the point of runoff.
2,4-D + 2,4-DP Ester	Patron 170 (Riverdale Chem. Co.)	Thoroughly wet the entire circumference of the base of the stems and root collars until spray collects around the root collar at ground line using a mixture of 3.8 to 5.1 ounces of Patron 170 added to 1 gallon of oil.

Tables 1-6 were adapted with permission from "Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland," F-45-97, Ohio State University, and reflect herbicides that are registered for use in timber stand improvement operations in Illinois.

Table 3, Continued

Dicamba	Banvel or Clarity (BASF)	Combine 11/2 gallons of water, 1 ounce emulsifier, 1 pint Banvel or Clarity, and 21/2 pints No.2 diesel fuel. Spray from ground line, making sure to cover the root crown, to a height of 12 to 18 inches until runoff when plants are dormant.
2,4-D + 2,2,4-D	Turf, Weed and Brush Control (Riverdale Chem. Co.)	Mix 3 to 4 gallons of Turf, Weed and Brush Control with 100 gallons of oil. Thoroughly wet the base and root collar of all stems during any season.
	Monterey Brush Buster (Lawn & Garden Products)	Mix Monterey Brush Buster with water and continuously agitate. Drench the base of plants and the lower 4/5 of the stems and leaves thoroughly to runoff. Apply when brush is in full foliage.

Table 4 Water soluble herbicides commonly used when treating cut stumps to prevent sprouting. Column one contains the common names of frequently used herbicides, column two contains one or more examples of commonly used brands along with their manufacturers or distributors, and column three contains a brief summary of use recommendations.

Common Names	Brand Names (Manufacturer or Distributor)	Recommendations
Dicamba	Banvel or Clarity (BASF)	Spray or paint freshly cut surface with 1 part Banvel or Clarity mixed with 1 to 3 parts water, making sure the area adjacent to the bark is thoroughly wet.
Glyphosate	Accord, Rodeo, Roundup Pro, Roundup Ultra, Honcho, Rascal, Roundup Original, or Roundup Custom (Monsanto) or Glyfos (Cheminova)	Apply a 50 to 100 percent solution of Accord, Rodeo, Roundup Pro, Roundup Ultra, Honcho, Rascal, Roundup Original, Roundup Custom or Glyfos to the freshly cut stump immediately after cutting. Delays in application will result in reduced performance.
Imazapyr	Stalker or Chopper (American Cyanamid)	Mix 8 to 12 ounces of Stalker or Chopper in a gallon of water and spray or brush the mixture onto the cambium area of a freshly cut stump surface.
	Arsenal Applicators Concentrate (American Cyanamid)	Mix 6 ounces of Arsenal Applicators Concentrate with a gallon of water and spray or brush the mixture onto the cambium area of a freshly cut stump.
Picloram + 2,4-D	Tordon 101 Mixture* (DowElanco)	Spray or paint to wet the cut surface of freshly cut stumps or stubs with Tordon 101 Mixture undiluted or diluted 1:1 with water.
2,4-D + 2,2,4-D + dicamba	Super Brush Killer2 (Dragon)	Mix 20 ounces of Super Brush Killer2 with 1 gallon of water. Treat stumps larger than 3 inches at any time of the year except when snow or ice prevent complete coverage. Thoroughly spray, until runoff is noticed, the entire tree stump soon after the tree is cut.

* Restricted use—must be a certified pesticide applicator to purchase or use.

Tables 1-6 were adapted with permission from "Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland," F-45-97, Ohio State University, and reflect herbicides that are registered for use in timber stand improvement operations in Illinois.

Table 5 Oil soluble herbicides commonly used when treating cut stumps to prevent sprouting. Column one contains the common names of frequently used herbicides, column two contains one or more examples of commonly used brands along with their manufacturers or distributors, and column three contains a brief summary of use recommendations.

Common Name	Brand Names (Manufacturer or Distributor)	Recommendations
Imazapyr	Chopper or Stalker (American Cyanamid)	Mix 8 to 12 ounces of Stalker or Chopper in one gallon of diesel oil or penetrating oil and spray or brush mixture onto the cambium area of the freshly cut stump surface.
Triclopyr	Garlon 4 (DowElanco)	Mix 26 to 38 ounces of Garlon 4 with enough oil to make one gallon and apply the mixture to the outer portion of the cut surface, the sides of the stump, and the root collar area. Thoroughly wet, but do not apply to the point of runoff. Treatments can be made any time of the year except when snow or water prevent spraying to the ground line.
2,4-D + 2,4-DP Ester	Patron 170 (Riverdale Chem. Co.)	Thoroughly drench the entire stump, including the cut surface, the bark, and the exposed roots with a mixture of 3.8 to 5.1 ounces of Patron 170 in 1 gallon of oil. Small stumps, 3 inches or less in diameter, may be cut close to the ground and treated by applying undiluted Patron 170 to the cut surface.
2,4-D + 2,2,4-D	Turf, Weed and Brush Control (Riverdale Chem. Co.)	Mix 3 to 4 gallons of Turf or Weed and Brush Control with 100 gallons of oil. Soak the entire stump of stems 3 inches dbh or larger in any season.
2,4-D + 2,2,4-D + dicamba	Super Brush Killer2 (Dragon)	Mix 20 ounces of Super Brush Killer2 with 1 gallon of mineral oil, kerosene, or either No. 1 or No. 2 diesel oil. Treat stumps larger then 3 inches at any time of the year except when snow or ice prevent complete coverage. Thoroughly spray the entire stump until runoff is noticed soon after the tree is cut.
2,4-D + dicamba	Brushkil Poison Oak & Ivy (Bonide)	Mix 8 ounces of product with 1 quart of diesel oil or kerosene. Apply to all areas of stump.

Tables 1-6 were adapted with permission from "Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland," F-45-97, Ohio State University, and reflect herbicides that are registered for use in timber stand improvement operations in Illinois.

Table 6 Undiluted herbicides commonly used when treating cut stumps to prevent sprouting. Column one contains the common names of frequently used herbicides, column two contains one or more examples of commonly used brands along with their manufacturers or distributors, and column three contains a brief summary of use recommendations.

Common Name	Brand Names (Manufacturer or Distributor)	Recommendations
Dicamba	Veteran CST (Riverdale Chem. Co.)	Spray or paint freshly cut stump surface with undiluted Veteran CST. The area adjacent to the bark should be thoroughly wet.
Imazapyr	Chopper RTU (American Cyanamid)	Spray or brush Chopper RTU undiluted solution onto the cambium area of the freshly cut stump surface and bark of the cut stump. Thoroughly wet, but do not cause puddling. Do not spray when rainfall is expected within 4 hours of application.
Picloram + 2,4-D	Tordon RTU or Pathway (DowElanco)	Spray or paint the cut surface of freshly cut stumps and stubs with undiluted Tordon RTU or Pathway.
Triclopyr	Garlon 3A (DowElanco)	Spray or paint the cut surface of freshly cut stumps or stubs with undiluted Garlon 3A.
	Pathfinder II (DowElanco)	Apply undiluted Pathfinder II on area adjacent to the cambium and bark around the entire circumference of the cut surface and down the sides of the stump to the root collar area. Apply to the point of wet, but not to the point of runoff. Treatments can be made any time of the year except when snow or water prevent spraying to the ground line. Control may be less effective during periods of moisture stress in the late summer.
	Redeem (DowElanco)	Spray or paint freshly cut surface of stumps with undiluted Redeem. The cambium area next to the bark is the most vital area to wet.
2,4-D + 2,2,4-D	Monterey Brush Buster (Lawn & Garden Products)	For stems under 3 inches DBH apply undiluted Monterey Brush Buster to freshly cut stems which have been cut as close to the ground as possible.

Tables 1-6 were adapted with permission from "Controlling Undesirable Trees, Shrubs, and Vines in Your Woodland," F-45-97, Ohio State University, and reflect herbicides that are registered for use in timber stand improvement operations in Illinois.

Tim's Tips

by Tim Ard, President
Forest Applications Training, Inc.
and Illinois Pro Logger
Training Instructor

Chain Saw Carburetor Adjustment

A properly running saw is essential to safe and productive tree felling. Everyone who operates a chain saw should understand how to adjust the carburetor. Even if you choose not to adjust the carburetor yourself, you should understand when a carburetor is out of adjustment and needs to be tuned by someone with the proper skills.

The following are the steps for adjusting the carburetor:

1. Check and clean the air filter on a routine basis.

2. Balance the high and low speed screws - Start and warm the saw to operating temperature. The high and low speed screws are turned completely in (clockwise). Each screw should then be backed off to the left one full turn (or some other amount according to the instructions in your owner's manual.)

The high speed screw is then turned clockwise to reduce fuel (clockwise reduces fuel). As the fuel mixture is leaned out, the saw will run faster until it sounds as if it is screaming. At this point, turn the high speed screw to the left to allow more fuel until a "flutter" is heard. This is the proper RPM for your saw.

This can be confirmed with a tachometer, but a tachometer alone cannot ensure that you have the right fuel mixture. It is possible that air leaks may prevent you from obtaining the proper fuel and air mixture and you may need to reduce the RPM to hear the "flutter". Therefore, the "flutter" is more important than the tachometer reading. Chain saw operators must understand that the fuel mixture accomplishes two additional functions—cooling of the motor and lubricating the engine. If the saw runs too lean, neither of these functions are accomplished effectively and the saw will be ruined.

3. Throttle - Ensure that the saw chain is not moving when the saw is on idle. If the chain is moving, turn the throttle screw counter-clockwise to slow the chain to a stop.

4. Roll-over Test - With the chain brake engaged, let the saw idle for 10-20 seconds and then turn the saw to different positions. If the saw stalls, it is getting too much fuel, which is puddling below the cylinder. Turn the low speed screw clockwise (reducing the fuel) a little bit and repeat the test.

5. Accelerate - Disengage the chain brake. If there is hesitation in acceleration, the saw motor is not getting enough fuel. Turn the low speed screw clockwise for more fuel and repeat the roll-over test

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Two Tri-State Forest Landowner Conferences Scheduled

Two tri-state forest stewardship conferences are being offered for landdowners who live in Illinois, Iowa, Missouri, and Wisconsin. On Saturday, March 13, 1999, forest landowners who live in the IL-IA-WI tri-state area are invited to attend the 5th annual Tri-State Forest Stewardship Conference held at Sinsinawa Mound Conference Center in Sinsinawa, WI. The conference program agenda is presented on the adjoining page of this newsletter. Landowners interested in attending may use the registration form at the bottom of the page. Last year, 650 people attended this conference making it one of the largest forest landowner conferences in the nation. This year's program agenda makes the 1999 conference equally exciting and informative. A Husqvarna chain saw will be given away as the grand door prize.

On Saturday, November 13, 1999, forest landowners living in the IL-IA-MO tri-state area will be able to attend the inaugrual Tri-State Forest Stewardship Conference, which will be held at the Holiday Inn in Quincy, IL. The conference agenda has not been established yet, but the format will be similar to the Sinsinawa, WI conference. Landowners interested in being put on a mailing list for this conference can contact Mike Bolin, Conference Chairman at the following address:

Mike Bolin, Conference Chairman
W-503 Turner Hall
1102 S. Goodwin Ave.
Urbana, IL 61801
217-333-2778
m-bolin@uiuc.edu

Tri-State Forest Stewardship Conference
Saturday, March 13, 1999
Sinsinawa Conference Center, Sinsinawa, WI

Conference Program Agenda

(Preregistration Required - No Walk-in Registration)

7:30-8:30 a.m. Conference Check-in and Continental Breakfast

8:30-9:00 a.m. Welcome and Conference Orientation and Announcements

9:15-10:15 a.m. Concurrent Session 1

1. "How to Grow Trees From Seed"
2. "Chain Saw Maintenance & Chain Sharpening
3. "How to Recognize Signs of Culturally-Significant Sites on Your Property"
4. "Interpreting Your Forest's Health" (2 hours, continued next session)
5. "Forest Landowners and the Federal Income Tax" (2 hours, continued next session)
6. "Inviting (Forest) Birds to Your Property"

10:30-11:30 a.m. Concurrent Session 2

7. "Tree Identification Basics"
8. "Timber Sales, Contracts, and Logging Aesthetics"
9. "Green Certification—What Does It Mean for Private Forest Landowners?"
10. "Interpreting Your Forest's Health (continued from Session 1)
11. "Forest Landowners and the Federal Income Tax" (continued from Session 1)
12. "Forest Succession—How to Maintain the Forest You Want"

12:00 noon-1:00 p.m. Concurrent Session 3

13. "Overview of Cost-Share Programs Available to Forest Landowners"
14. "Mechanics of Directional Felling (Outdoors)
15. "Riparian Buffers and Filter Strips—Common Sense Conservation"
16. "Exotic Plants—Coming to a Woodland Near You"
17. "Prescribed Burning in Private Woodlands—Why and How"
18. "Managing Damage From Woodland Wildlife"

1:10-2:15 p.m. Buffet Luncheon

2:25-3:25 p.m. Concurrent Session 4

19. "Controlling Soil and Gully Erosion on Your Property"
20. "How to Nurture and Abused Woodland"
21. "Restoring Savanna on Your Property" (2 hours, continued next session)
22. "Winter Tree Identification" (2 hours, continued next session)
23. "Soils and Their Relationship to Tree Growth"
24. "The Forest is More Than Trees—A Natural Heritage Biologist's Perspective on Management Plan Development"

3:40-4:40 p.m. Concurrent Session 5

25. "Exotic Plants—Coming to a Woodland Near You" (repeat)
26. "Chain Saw Maintenance & Chain Sharpening (repeat)
27. "Restoring Savanna on Your Property" (continued from Session 4)
28. "Winter Tree Identification" (continued from Session 4)
29. "Basics of Conifer Plantation Management"
30. "Woodland Mushroom Indentification"

Yes, I would like to attend the 1999 Tri-State Forest Stewardship Conference (please check which one).

☐ Saturday, March 13, 1999
Sinsinawa Mound Conference Center, Sinsinawa WI

☐ Saturday, November 13, 1999
Quincy Holiday Inn, Quincy, IL

Please send me registration information

Name: _____
Address: _____
City _____ State _____ Zip _____

Return to: Judy Stoll, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801; 217-333-3650

Illinois Agricultural
Statistics Service
P.O. Box 19283
Springfield, IL 62794-9283
Ph (217) 492-4295
U.S. Department of Agriculture

ILLINOIS TIMBER PRICES

DIVISION OF FOREST RESOURCES
600 North Grand Avenue West
Springfield, Illinois, 62706
Phone: (217) 782-2361

DEPARTMENT OF
NATURAL
RESOURCES

December 1, 1998

PRICES PAID ILLINOIS TIMBER PRODUCERS
MAY 1998 THROUGH AUGUST 1998

Winter sawtimber prices paid to Illinois timber growers generally showed mixed trends for F.O.B. Mill and stumpage compared to both the previous winter and summer. Of the timber buyers reporting volume of their 1998 operation, 42% indicated their volume was 500 thousand board feet or more.

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones, based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS
SAWTIMBER - $ PER M BD. FT.

SPECIES	May 1997 - August 1997		November 1997 - February 1998		May 1998 - August 1998	
	Stumpage	F.O. B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
Ash	150	320	150	330	160	310
Basswood	100	220	100	230	90	210
Beech	75	180	75	180	70	160
Cottonwood	60	150	55	160	60	160
Sweet Gum	75	180	60	170	80	180
Elm & Hackberry	75	170	70	170	70	180
Hickory	85	190	80	200	80	220
Soft Maple	95	220	100	240	120	240
Sugar Maple	140	300	150	320	190	300
Black Oak	160	300	160	320	170	310
Pin Oak	80	180	90	180	85	180
Red Oak	240	410	240	420	260	410
White Oak	220	380	230	400	250	390
Yellow Poplar	120	290	140	270	130	230
Sycamore	65	170	70	170	70	180
Black Walnut	340	510	310	490	350	480
Woods Run Bottomland	90	200	110	210	100	210
Woods Run Upland	130	270	180	330	180	270
FACE VENEER - $ PER M BD. FT.						
Red Oak	620	990	600	1,220	530	890
White Oak	1,000	1,800	1,120	1,840	820	1,530
Walnut	1,500	2,300	1,470	2,330	1,550	2,780
COOPERAGE - $ PER M BD. FT.						
White Oak	250	420	300	550	300	580
UNPEELED PULPWOOD - $ PER TON						
Ton	2.00	17.00	2.70	19.00	3.20	19.70

Timber Prices
May 1998 - August 1998
December 1, 1998

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
May 1998 - December 1998

PRODUCT	UNIT	Zone 1		Zone 2		Zone 3	
		Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
1. Sawtimber				Dollars			
Ash	M bd. ft.	100-200	250-350	80-250	250-400	80-250	250-300
Basswood	M bd. ft.	100	200	50-150	150	50-150	140-325
Beech	M bd. ft.	50-100	225	NA	100	50-70	140-150
Cottonwood	M bd. ft.	40-100	120-170	50-100	140-200	30-60	120-200
Sweet Gum	M bd. ft.	50-110	200	70-100	180-200	60	140-150
Elm & Hackberry	M bd. ft.	50-110	200-225	50-100	180-200	30-75	140-200
Hickory	M bd. ft.	50-125	200-250	50-100	180-300	50-75	150-320
Soft Maple	M bd. ft.	75-125	200-225	70-200	180-360	70-200	160-370
Sugar Maple	M bd. ft.	150-250	250-400	120-250	180-450	150-250	200-400
Black Oak	M bd. ft.	150-250	270-500	100-300	180-450	80-200	200-375
Pin Oak	M bd. ft.	50-110	200-225	50-165	150-200	30-100	150-160
Red Oak	M bd. ft.	180-300	350-450	150-400	200-750	150-400	200-600
White Oak	M bd. ft.	160-300	300-750	150-500	200-750	150-500	200-500
Yellow Poplar	M bd. ft.	100-200	250-280	NA	200	80	160-240
Sycamore	M bd. ft.	50-110	200-225	50-100	150-200	30-60	150
Black Walnut	M bd. ft.	250-450	250-500	200-500	500	100-500	400-600
Woods Run Bottomland	M bd. ft.	60-150	180-250	65-160	150-180	50-200	150-320
Woods Run Upland	M bd. ft.	100-250	180-400	70-250	180-400	100-300	200-400

		STATEWIDE	
		Stumpage	F.O.B. Mill
2. Face Veneer			
Red Oak	M bd. ft.	350-800	600-1,500
White Oak	M bd. ft.	500-1,200	850-2,330
Walnut	M bd. ft.	450-3,000	1,200-4,000
3. Cooperage			
White Oak	M bd. ft.	220-400	550-600
4. Pulpwood			
Unpeeled	M bd. ft.	3.00-3.50	18.00-21.00

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	97
Scribner	3
International	-

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rated Reported $/M bd. ft.
Zone 1	18	100-180
Zone 2	18	150-250
Zone 3	14	150-300
Illinois	17	100-300

VOLUME OF 1997 OPERATIONS

Size in (000) bd. ft.	Zone 1	Zone 2	Zone 3	All
	%	%	%	%
1 - 100	6	27	46	28
100 - 500	29	33	25	30
500 - 1,000	12	7	8	8
1,000 - 3,000	24	23	4	17
3,000 +	29	10	17	17

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer" used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

MARKED TIMBER SALES - MAY 1998 - AUGUST 1998
STATEWIDE STUMPAGE
Woods Run Upland $152-$427/M bd. ft.
Woods Run Bottomland $181-$320/M bd. ft.
*Prices supplied to District Foresters by seller, may include some veneer.

Garry D. Kepley, State Statistician
Tom Pordugal, Rick Kestle, Agricultural Statisticians

"Printed by authority of the State of Illinois, "11/18/98, 1,650, 6991

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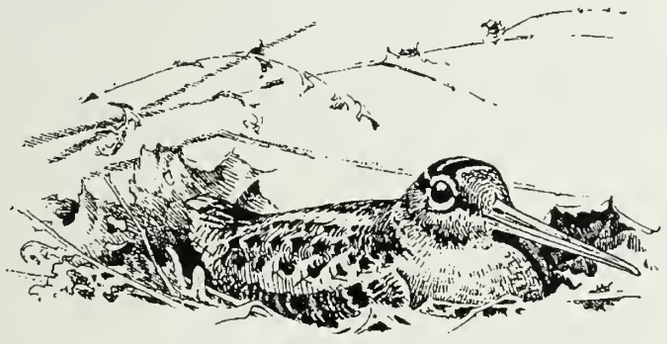
UNIVERSITY OF ILLINOIS EXTENSION

ILLINOIS FOREST MANAGEMENT

Biannual Newsletter for Illinois Landowners

Volume 1, 1999 No. 36

IN THIS ISSUE



Woodcock illustration by Ned Smith

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and University of Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801.

The following article is a continuation in the series of **Tim's Tips** articles reprinted from the logger training manual developed by Mike Bolin, Extension Forester and Tim Ard, president of Forest Applications Training, Inc. for the ***Illinois Pro Logger Training Program***. The chain saw safety and timber felling information is useful for landowners who own and use a chain saw on their property.

THE FELLING PLAN

Timber harvesting and competitive sports have many similarities. Both require skilled professionals, teamwork, communication, and a good game plan. Perhaps the most important is the plan for without it, there would be no consistancy in the way timber harvesting is accomplished.

The following elements are an integral part of any good tree felling plan:

1. Identify Potential Hazards - Look up into the crown of the tree and identify dead limbs and hanging branches that could possibly fall on you as the tree begins to fall. Also assess the area into which the tree will fall for hazards. Clearing ground debris and live saplings or shrubs within the immediate vicinity of the designated tree is very important. Make a mental note of where these hazards are and be alert for any that might dislodge as the tree falls. Once the tree's on the ground, pause to observe any residual trees that are still swaying for any limbs that might fall.

2. Determine Side or Weighted Lean - Most trees lean to one side or the other. Side lean determines the 'good and bad' side of the tree with respect to the side the chain saw operator should finish on. It is desirable, but not always possible, to cut from the good side of the tree. The bad side of the tree is the side to which it leans or is weighted. It is possible to have the tree's trunk leaning one way and to have the majority of the the tree's crown on the opposite side. While standing back from the tree along the felling line, the operator should look up into the tree and draw a circle around the outer-most limbs of the tree's canopy. From the center of this imaginary circle, drop an imaginary plumb line to the ground. The distance from this spot on the ground to the center of the tree's trunk gives a good estimate of the amount of weighted side lean.

3. Determine Your Escape Route - Always pick a "retreat route" away from a falling tree. This escape route should be clear of ground debris and should be opposite the direction of fall and at a 45 degree angle away from the butt of the tree.

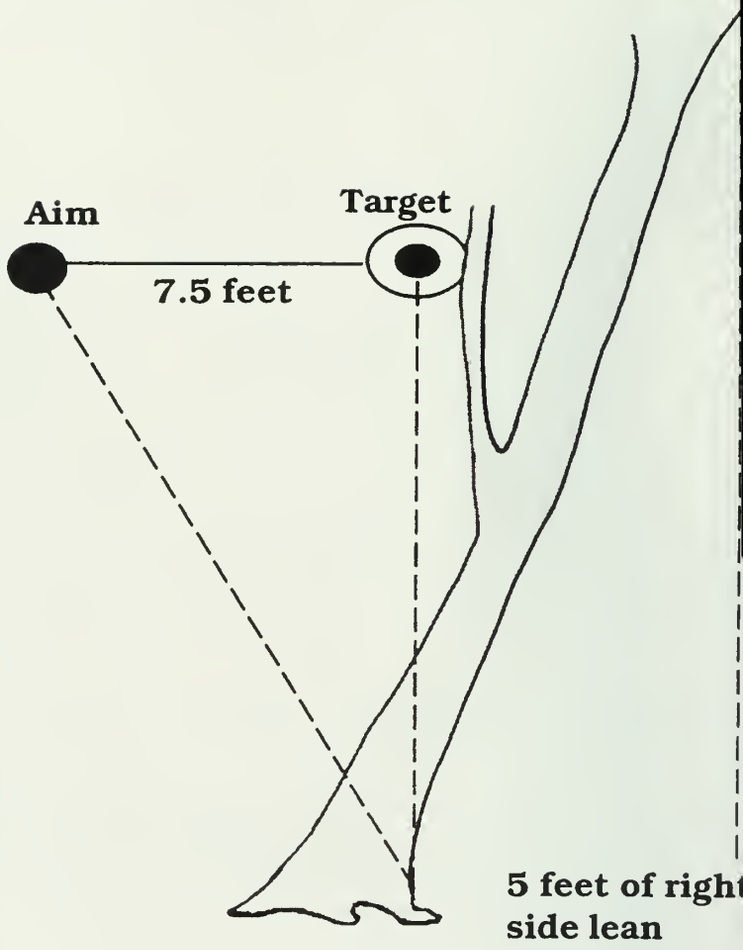
4. Determine the Hinge Size - To control the fall of a tree, a hinge is necessary. Setting up the right length and thickness of hinge are important to avoid pulling fiber from the butt log as the tree falls. As a general rule of thumb, use 10% of the diameter of the tree at D.B.H. (4.5 feet above the ground) for the width of the hinge. It should have equal width across the stump. For example, a 15-inch tree should have a hinge 1.5 inches wide (thick). After felling a few trees, look to see if you're getting fiber pull. If so, reduce the width of the hinge. Hinge width (thickness) will vary by species, also.

The length of the hinge is also important in guiding the direction of fall. The general rule of thumb here is to set up a hinge length that is 80% of tree's diameter at D.B.H. A 15-inch tree would need a 12-inch hinge. Some trees with heavy side lean will require a hinge of greater length.

5. **Establish Your Cutting Plan.** After the notch and hinge are set up, how do you intend to finish the back cut? This cut should be level with the open face notch. Always remember to finish the back cut on the good side of the tree. If this is not possible, be aware of hazards that could cause safety problems. If problems arise, re-assess the situation before falling the tree.

Considering Side Lean

Trees with side lean pose a special problem. In addition to creating a good and bad side of the tree as discussed earlier, side lean can make it difficult to place a tree exactly where the operator would like it to go. For example, a tree with 5 feet of side lean will actually land 5 feet to the right of where the base of the tree is aimed. This may be enough to cause a tree to hang up or create skidding problems. Therefore, trees with side lean should actually be aimed in the other



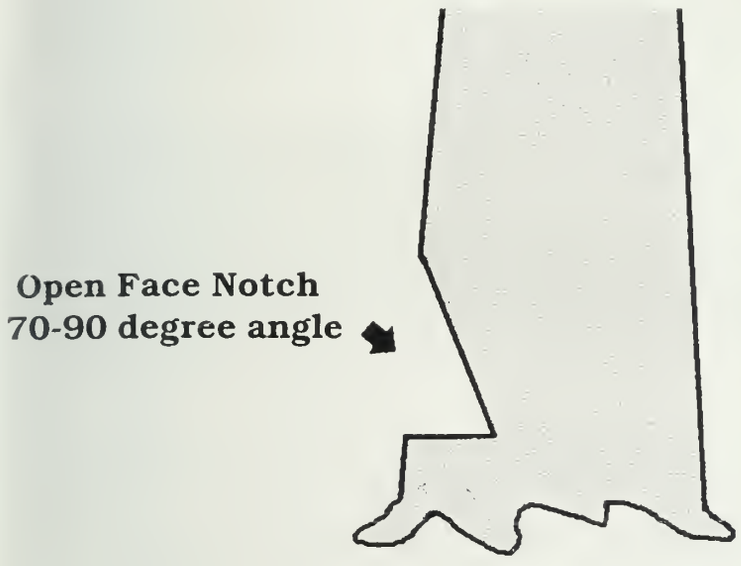
direction.

For example, a tree with 5 feet of right side lean should be aimed least 5 feet to the left of the intended target. However, it has bee observed that the hinge weakens as the tree falls and at some poi the side lean weight of the tree tends to pull it in that directio Therefore, a rule of thumb has been developed that says aim th tree an additional 50% of the side lean in the opposite directio For example, our tree with 5 feet of right side lean must be aime 7 1/2 feet to the left of the intended target.

Open Face Notch and Sight Line

The function of the notch is to allow the tree to fall without breal ing the hinge prematurely. Typically, most notches used by lo gers and landowners are less than 45 degrees. These small notch close up before the tree has fallen even half-way to the groun When this happens, stress is put on the hinge causing fiber pu and splitting of the butt log or barber-chairing.

The proper undercut should be an open face at least 70 to 90 degrees (see illustration below). The best way to form this opening is to make the top cut first. The chain saw operator cuts in a downward and slightly inward direction until the width of the notch is approximately 80% of the diameter of the tree (see' Setting Up the Hinge' later). The operator then removes the chainsaw and finishes the notch by making the second (bottom) cut in a slightly upward direction.



The advantages of making the top cut first are that the operator can easily establish hinge width and can also look into the top cut and actually see when the second cut meets. With practice, a chainsaw operator should be able to have both cuts meet exactly on the first try. A by-pass of no more than 3/8 inch is acceptable.

Positioning the Notch and Direction of Fall

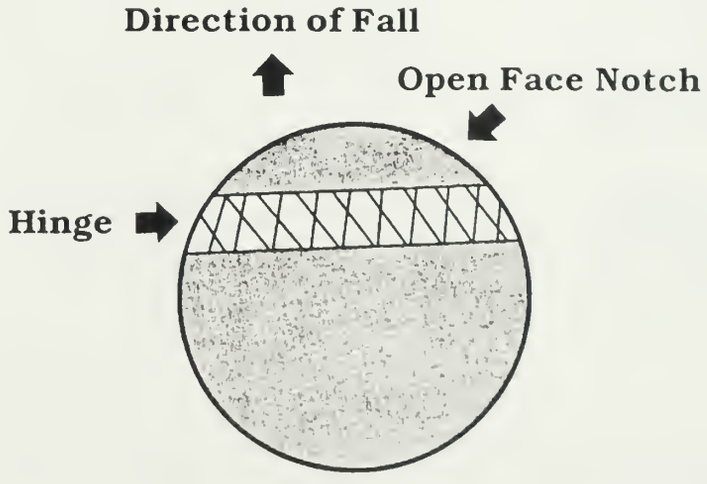
Many saws have a built-in sight line which can be used to establish falling direction of a tree. The line is usually a raised ridge of plastic or a decal. In the absence of a sight line, any seam on the casing which is perpendicular to the bar is acceptable.

The operator stands behind the saw while leaning against the tree and sights over the saw. Most saws have a felling sight on them similar to the sight on a rifle. Look for a straight line that is molded into the plastic case on the top of the saw. Pointing this sight line at your target will position the notch cut in the tree's trunk in the direction you want to fell the tree. When the target and the sight line are lined up, the operator begins the first downward cut of the notch. The bottom cut is then made and the resulting face notch will determine the direction of fall of the tree (see photo next page).

The sight line on the saw can be used like a gun sight to determine an exact falling direction for the tree.

Setting Up The Hinge

The hinge is the single most important part of the felling cut. It controls the felling direction, reduces the chance for hang-ups, and can increase productivity. If a proper notch has been formed, the hinge will control the fall of the tree all the way to the ground.



Hinges should be the same thickness all the way across the stump. If the hinge is pointed in the proper direction, using the sight line on the saw, the tree will fall correctly.

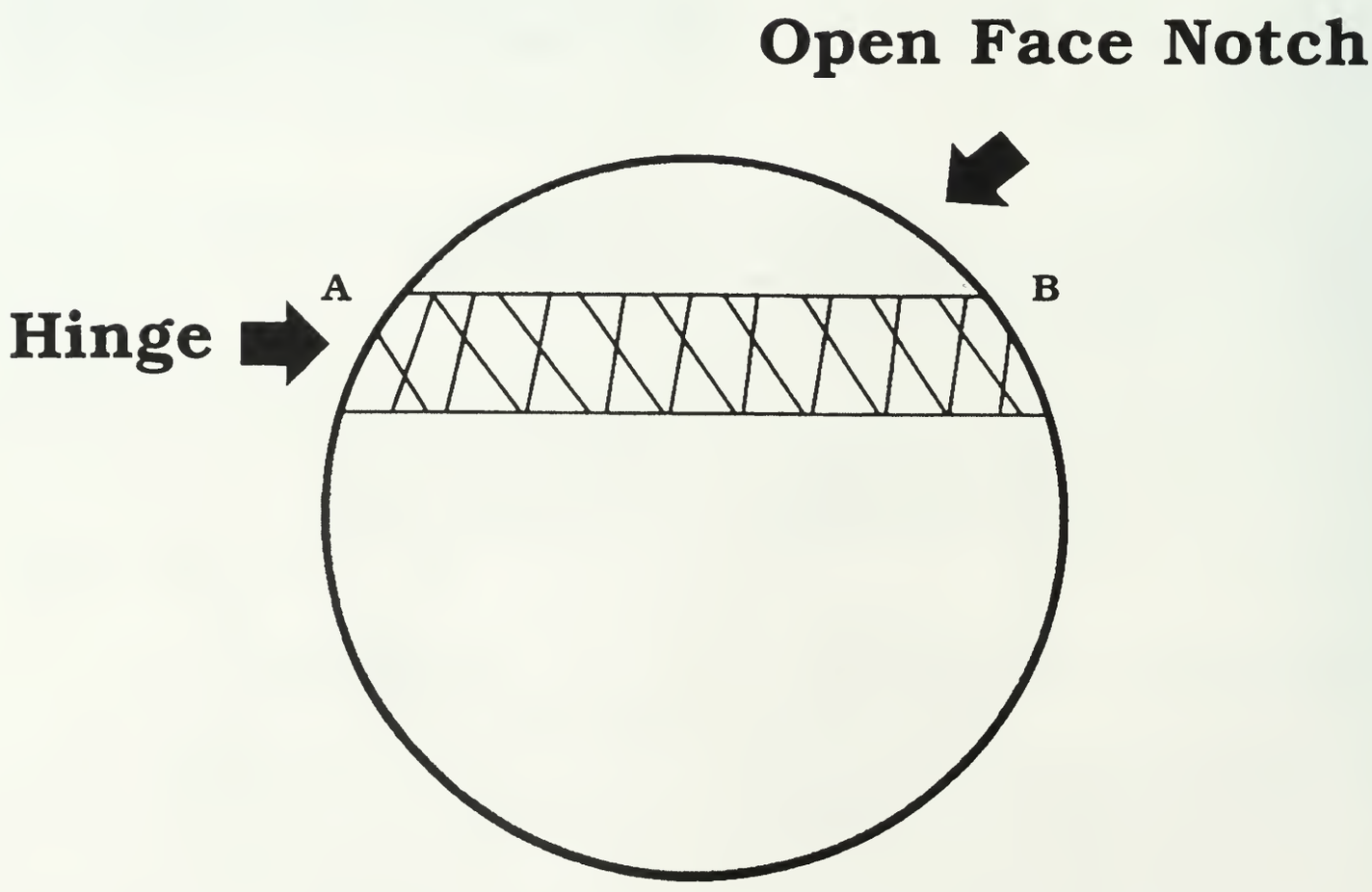
Loggers often attempt to swing trees into openings by cutting the hinge off on one side. Efforts to swing trees into openings often result in hung trees. This is because it is difficult to guess how much of the hinge should be cut off to swing a tree. It is much more accurate to aim or sight the tree and have it fall exactly in the intended direction.

It should also be noted that the fibers of the hinge tend to break from the back. As the tree falls, fibers along the back of the hinge will break first. After the tree reaches a certain point in its fall, only the fibers at the front of the hinge are left to finish steering the tree. Therefore, making a hinge thin on one side will not accomplish any steering function.

Cutting off all or any part hinge is considered a safety violation. The only time a hinge can be cut is if the tree does become hung up. It may become desirable to cut off one side or all of the hinge so the tree will roll out, but exercise extreme caution when doing this.

The length and thickness (width) of the hinge are dependant on the species of tree and its DBH (diameter at breast height, 4 1/2 feet above the ground). A good rule of thumb for the thickness (width) of the notch is 10% of the tree's DBH. This can be increased or reduced depending on the species. For example, hickory will likely pull fiber if the hinge is too thick. Something less than 10% of DBH would be appropriate for hickory.

The length of the hinge is also calculated from the tree's DBH. Again a good rule of thumb to use is 80% of the tree's DBH. This means the logger will have to visualize how far back he will have to cut the notch to achieve a hinge width of 80% of the tree's DBH. Refer to the diagram below for an example of these two hinge calculations.



The length of the hinge (A to B) is 80 percent of the tree's diameter at 4.5 feet above the ground (D.B.H.) The thickness (width) of the hinge is 10 percent of the tree's D.B.H.

The Back Cut

The back cut is important because the execution of this cut determines the proper formation of the hinge and releases the tree to allow it to fall. Before determining the proper technique for the back cut, the chain saw operator must determine if the tree has forward or backward lean. If the tree leans back, a wedge or wedges may be needed to lift the tree to an upright position until its center of gravity is moving forward and it will fall on its own. A tree that is standing straight or one that has back lean will require additional steps in the back-cut plan. The back-cut plan is actually number 5 in the information gathered before felling occurs; check for hazards, determine weighted side and forward/back lean, determine your escape route, calculate the hinge size, then develop your **back-cut plan**.

1. Small Trees and Trees with Little or Forward No Lean - The best way to cut these trees is to make the open face notch and cut straight in from the back making sure sufficient hinge is left to control the fall of these trees.

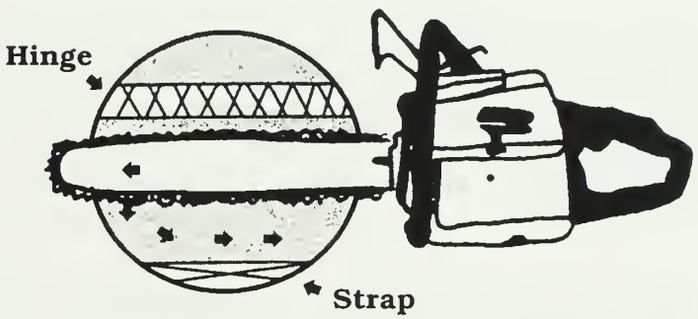
Some trees with little or no forward lean may need a push by hand to get them falling. If the tree is big enough, a wedge can be inserted behind the saw.

2. The Bore Cut - Trees with backward or forward lean pose some difficulty and generally require the formation of a proper hinge prior to completing the back cut. On these trees it is recommended that the operator use the bore or plunge cut as the first step in making a back cut. If your saw has a tip guard on the bar to help prevent kickback from occurring, you will not be able to make a plunge or bore cut.

When attempting a bore cut, it is very important to always use the attack corner of the chain saw bar. The attack corner is the bottom corner of the bar tip. Never use the kickback zone or top corner of the bar tip as kickback might result. It is also very important for the teeth to be properly filed and that the saw runs at maximum RPM when making the cut. The faster the chain spins, the smoother the cutting surface. A slow turning chain has a tendency to want to 'jump' and bounce as it cuts and kickback could easily occur.

3. Trees with Forward Lean - Trees with forward lean can easily split, pull splinters, or barber chair. Therefore, it is important on these trees to use the bore cut, set up the desired hinge thickness, and then complete the back cut leaving a strap of uncut wood at the back of the tree. This strap of wood and the hinge will hold the tree in place and prevent it from falling until you are ready to release it.

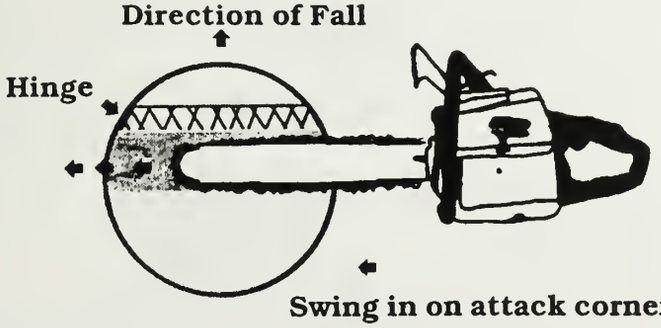
Trees with Forward Lean



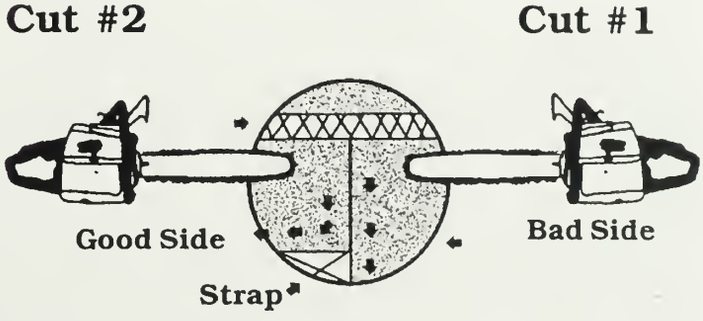
Standing along the escape route, the operator may now cut the holding strap of wood about 1/2 to 1 inch below the level of the back cut. The wood strap will split, releasing the tree and allow it to fall in the desired direction while the operator is retreating on the escape route out of danger.

Sometimes if a tree has very little forward lean, the operator may elect to just cut straight back out of the tree without leaving a strap.

If the tree diameter is too big for the chain saw bar to reach all the way through, the tree can be bore cut from both sides. Using the corner of the notch to guide the start of each bore cut will ensure the cuts are fairly level. It is important to initiate the bore cut from the bad side first reaching no more than half way through the tree.



Bore Cut

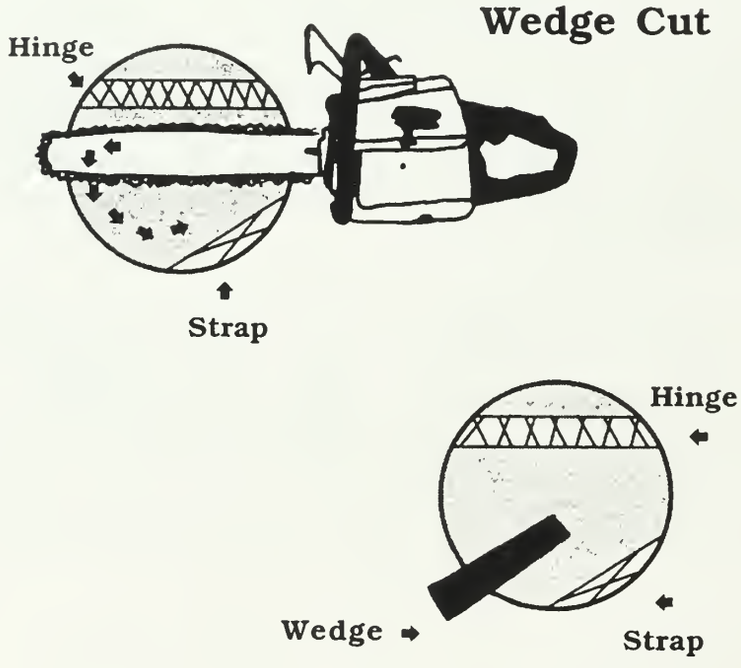


Cut #3/Final Cut

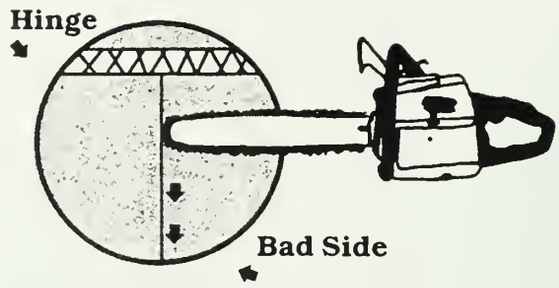
The operator may then cut back out of the tree on the bad side, move himself/herself to the good side of the tree and bore cut through to meet the first cut. He/she then cuts back out on the good side leaving a strap which can be released from the escape route. With experience, the bore cuts will meet exactly, or almost exactly, forming a level, precise stump.

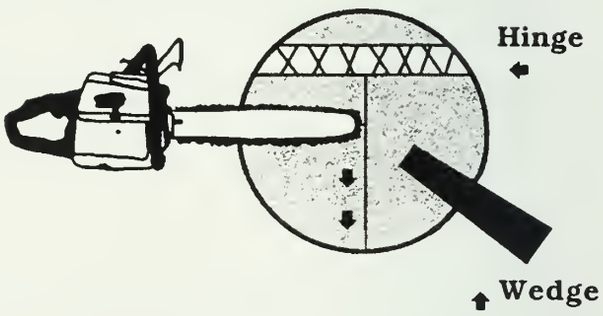
4. Trees with Back Lean - Trees with back lean present special problems in that they may set back on the saw while making the back cut. The use a wedge is recommended on all trees with back lean. The *'Tim's Tip'* feature in the next issue of *Illinois Forest Management Newsletter* wil focus on how to determine if a wedge is necessary and how to use it properly.

If the tree is small enough for the bar to reach all the way through, the simplest method is to bore cut the tree from the good side forming a precise hinge, swing the tip of the bar towards the rear of the tree leaving a strap of wood to prevent the tree from sitting back. Insert a wedge between the hinge wood and the strap. Cut the strap and drive the wedge with an ax. This is illustrated below.



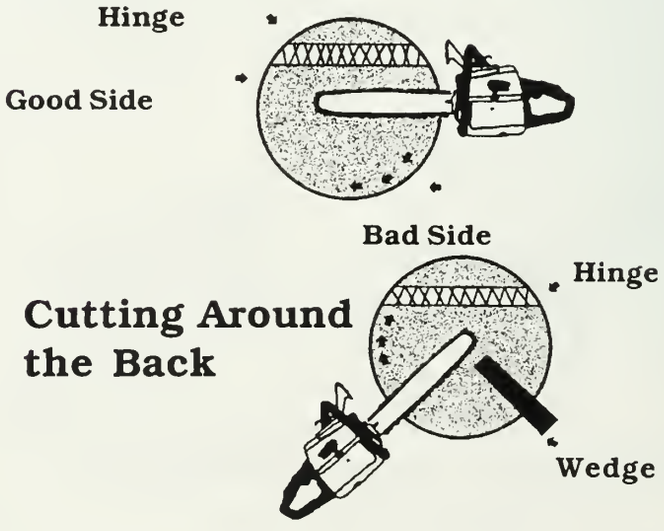
If the tree is too big for the bar to reach all the way through, bore from the bad side first, remembering not to bore more than half way through the tree. Bring the saw straight to the back of the tree on the bad side. Insert a wedge in this opening. The next step is to bore from the good side slightly below the first bore cut and cut back through the tree about 1/2 inch below the wedge. Hitting the wedge a couple of times with an ax will split the holding wood and force the tree over. Refer to the illustrations above. Care must be taken to never saw the supporting wood under the wedge.





Make the second cut 1/2" below the first cut to avoid hitting the wedge.

Another method to use on trees that are bigger than the bar is to first bore half-way through the tree on the bad side, start cutting out towards the back of the tree and then swing the saw around the tree towards the good side. When the saw is approximately half way around, insert a wedge behind it and continue cutting toward the good side until the hinge is completely formed. Take the saw out and drive the wedge until the tree begins to fall. Refer to the illustration below for this method.



Tax Saving Tips for Tree Planting Projects

If you planted trees (reforestation project) on your property this year, you may want to look into the federal income tax's Reforestation Tax Credit and Amortization option when you prepare your 1999 tax return.

The reforestation tax credit and 7-year amortization continues to be one of the best tax advantages for forest landowners. If you reforested during 1999, you can claim a 10-percent investment tax credit for the first $10,000 you spent for reforestation during the tax year. In addition, you can amortize (deduct) all of your 1999 reforestation costs (up to $10,000), minus half the tax credit taken, over the next 7 years (actually 8 tax years). The election to amortize must be made on a timely tax return for the year in which the reforestation expenses were incurred. (Passive owners may or may not be eligible for the amortization and credit).

Here's how it works. Assume you spent $4,000 to plant an tract of ground on your property in 1999. You claim a $400 tax credit (10 percent of $4,000) for 1999. You can also deduct 95 percent of these reforestation costs over the next 8 tax years. Due to a half-year convention you can only claim one-half of the annual amortizable portion for 1999. This means that on your 1999 tax return you can deduct one-half of (0.95 x $4,000 divided by 7) or $271. For the next 6 tax years you can deduct (0.95 x $5,000 divided by 7) or $542, and the remaining $271 can be deducted the 8th tax year.

The annual reforestation amortization is a deduction to adjusted gross income. It can be claimed on Form 1040 on the line for adjustments rather than being claimed on Schedule A under miscellaneous deductions. (If you use Schedule A for this purpose, you can claim only aggregated miscellaneous deductions that exceed 2 percent of adjusted gross income). Form 3468 is used to claim the investment tax credit.

Any reforestation costs exceeding the $10,000 annual limit should be capitalized (entered into your timber account). You can recover (deduct) these costs when you sell the timber.

A final word of caution: the tax credit and 7-year amortization deductions are subject to recapture if you dispose of your trees—within 5 years of planting for the credit and within 10 years of planting for the amortization.

Cost-share Payments

If you received cost-share assistance under one or more of the Federal or State cost-share programs for your reforestation project, you may have to report some or all of it as ordinary income. You have several options. You have the option to include it as income and then recover the part that you pay plus the cost-share payment through the amortization and reforestation tax credit already described. You also have the option to exclude the "excludable portion" from income if certain conditions are met. These conditions are:
(1) the cost-share program has to be approved for exclusion by the IRS; and
(2) the maximum amount excludable per acre is the greater of: (a) the present value of $2.50 per acre or (b) the present value of 10 percent of the average income per acre for the past 3 tax years.

This second requirement gets rather complicated because you have to determine an appropriate interest rate to compute the present values. Programs approved for exclusion by the IRS include the Forestry Incentives Program (FIP), the Forest Stewardship Incentive Program (SIP), the Wetlands Reserve Program (WRP), the Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP), plus several State programs (check with the Illinois DNR - Division of Forest Resources in Springfield [217-782-2361] if you planted trees under the Illinois Forestry Development Act program).

In some cases, taxpayers may be better off to exclude cost-share payments, while others may be better off not to exclude the payments. Instead, these landowners may be better off to claim the cost-share payments as part of the reforestation tax credit and 7-year amortization. The important point here is: You must report cost-share payments. If you decide to exclude, attach a statement to your return that states specifically what cost-share payments you received, that you choose to exclude some or all of them, and how you determined the excludable amount.

Trees Planted Under the Conservation Reserve Program

If you planted trees under the Conservation Reserve Program (CRP), you must report your annual payment as ordinary income. If you received CRP cost-share assistance funds for planting your trees, you must also report these as ordinary income. CRP cost-share payments used to establish trees can be claimed as part of the reforestation expenses reported for the reforestation tax credit and 7-year amortization.

Farmers may treat expenditures for soil and water conservation on farmland as expenses in the year incurred, rather than capitalizing them (CRP expenditures qualify). However, the amount deductible in any year shall not exceed 25 percent of the gross income from farming.

Adapted from a US Forest Service Southern Region website article written by Larry Bishop, Forest Management and Taxation Specialist, Atlanta, GA.

Tri-State Forest Landowner Conference Scheduled

Landowners who live in western Illinois, southeast Iowa and northeast Missouri are invited to attend the Tri-State Forest Stewardship Conference on Saturday, November 13, 1999 at the Quincy Holiday Inn in Quincy, IL. The conference program agenda is presented below. Landowners interested in attending may use the form on this page or they may call Judy Stoll @ 217-333-2778 and ask for the conference brochure/registration form to be sent to them. Registration is $25.00 per person and includes a continental breakfast and lunch. Pre-registration for the conference is required.

Tri-State Forest Stewardship Conference
Saturday, November 13, 1999
Quincy Holiday Inn, Quincy, IL

Conference Program Agenda

(Pre-registration Required - No Walk-in Registration)

7:30-8:30 a.m. Conference Check-in and Continental Breakfast
Visit with your State Service Forester and NRCS District Conservationist in the Douglas Room

8:30 a.m. Welcome and General Announcements

8:45 a.m. Opening General Session - "Identifying and Establishing Your Forest and Land Management Goals"

Concurrent Sessions

9:45-10:45 a.m. "Steps to Producing High Quality Timber"
"Agroforestry—An Overview"
"Woodland Wildflower Identification"

10:45-11:10 a.m. Morning Break

11:10 a.m. - 12:10 "Nut Production—An Alternative Income Opportunity"
"Steps to a Successful Timber Sale"
"Exotic Species—Coming to a Woodland Near You"

12:15-1:15 p.m. Luncheon

1:20-2:20 p.m. "Tree Seed Collection—An Alternative Income Opportunity"
"Mechanics of Tree Pruning"
"Introduction to Woodland Wildflower Propagation"

2:30-3:30 p.m. "Riparian Forest Buffers—Common Sense Conservation"
"Processing Your Trees Into Useful Products"
"Introduction to Tree Indentification"

3:40-4:40 p.m. "Leased Hunting—An Alternative Income Opportunity"
"Government Cost-Share Programs for Forest Landowners"
"Steps to Successful Tree Planting"

4:45 p.m. Adjourn

Yes, I would like to attend the 1999 Tri-Sate Forest Stewardship Conference in Quincy, IL

Please send me registration information

Name: _____

Address: _____

_____

City: _____ State: _____

Zip: _____

Return to: Judy Stoll, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801; 217-333-3650

Illinois Agricultural
Statistics Service
P.O. Box 19283
Springfield, IL 62794-9283
Ph (217) 492-4295
U.S. Department of Agriculture

ILLINOIS TIMBER PRICES

DIVISION OF FOREST RESOURCES
600 North Grand Avenue West
Springfield, Illinois, 62706
Phone. (217) 782-2361

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

June 2, 1999

PRICES PAID ILLINOIS TIMBER PRODUCERS NOVEMBER 1998 THROUGH FEBRUARY 1999

Winter sawtimber prices paid to Illinois timber growers generally showed mixed trends for F.O.B. Mill and stumpage compared to both the previous winter and summer. Of the timber buyers reporting volume of their 1998-99 operations, 37% indicated their volume was 500 thousand board feet or more.

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones, based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS
SAWTIMBER - $ PER M BD. FT.

SPECIES	November 1997 - February 1998		May 1998 - August 1998		November 1998 - February 1999	
	Stumpage	F.O. B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
Ash	150	330	160	310	160	300
Basswood	100	230	90	210	100	250
Beech	75	180	70	160	80	200
Cottonwood	55	160	60	160	55	160
Sweet Gum	60	170	80	180	80	180
Elm & Hackberry	70	170	70	180	75	180
Hickory	80	200	80	220	100	240
Soft Maple	100	240	120	240	100	240
Sugar Maple	150	320	190	300	160	320
Black Oak	160	320	170	310	170	300
Pin Oak	90	180	85	180	85	200
Red Oak	240	420	260	410	220	360
White Oak	230	400	250	390	220	360
Yellow Poplar	140	270	130	230	140	280
Sycamore	70	170	70	180	70	170
Black Walnut	310	490	350	480	350	510
Woods Run Bottomland	110	210	100	210	100	210
Woods Run Upland	180	330	180	270	150	250
FACE VENEER - $ PER M BD. FT.						
Red Oak	600	1,220	530	890	480	920
White Oak	1,120	1,840	820	1,530	970	1,660
Walnut	1,470	2,330	1,550	2,780	1,390	1,940
COOPERAGE - $ PER M BD. FT.						
White Oak	300	550	300	580	280	450
UNPEELED PULPWOOD - $ PER TON						
Ton	2.70	19.00	3.20	19.70	3.00	19.50

Timber Prices
November 1998-February 1999
June 2, 1999

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
November 1998-February 1999

PRODUCT	UNIT	Zone 1		Zone 2		Zone 3	
		Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
1. Sawtimber				Dollars			
Ash	M bd. ft.	100-250	200-300	80-300	300-400	60-250	180-370
Basswood	M bd. ft.	NA	150-350	40-155	150-400	60-225	160-350
Beech	M bd. ft.	50-100	190-200	80-100	200	NA	NA
Cottonwood	M bd. ft.	50-80	150-190	25-90	120-200	20-80	100-200
Sweet Gum	M bd. ft.	50-125	130-220	60-120	120-210	NA	NA
Elm & Hackberry	M bd. ft.	50-100	150-300	40-120	120-250	30-100	120-250
Hickory	M bd. ft.	75-150	150-350	40-200	125-400	50-200	150-400
Soft Maple	M bd. ft.	50-100	150-350	40-200	150-380	50-200	160-360
Sugar Maple	M bd. ft.	100-250	200-450	80-350	190-600	60-300	180-450
Black Oak	M bd. ft.	100-300	220-400	75-400	150-500	50-200	150-350
Pin Oak	M bd. ft.	50-125	150-220	40-120	120-250	50-150	150-300
Red Oak	M bd. ft.	200-370	220-500	80-400	240-500	100-350	200-500
White Oak	M bd. ft.	180-400	350-550	80-400	220-500	80-350	200-490
Yellow Poplar	M bd. ft.	100-200	200-400	60-250	200-400	NA	NA
Sycamore	M bd. ft.	50-100	130-220	30-100	100-250	30-100	120-200
Black Walnut	M bd. ft.	150-800	250-650	60-700	250-700	120-550	200-850
Woods Run Bottomland	M bd. ft.	80-150	180-300	50-200	120-250	20-150	200-300
Woods Run Upland	M bd. ft.	80-250	190-400	60-300	160-325	50-300	250-300

		STATEWIDE	
		Stumpage	F.O.B. Mill
2. Face Veneer			
Red Oak	M bd. ft.	200-1,000	800-1,000
White Oak	M bd. ft.	200-1,800	950-2,500
Walnut	M bd. ft.	600-2,000	1,500-2,500
3. Cooperage			
White Oak	M bd. ft.	150-400	300-550
4. Pulpwood			
Unpeeled	M bd. ft.	2.00-4.00	17.25-22.00

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	96
Scribner	4
International	-

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rated Reported $/M bd. ft.
Zone 1	18	100-200
Zone 2	14	140-300
Zone 3	16	110-250
Illinois	15	100-300

VOLUME OF 1997 OPERATIONS

Size in (000) bd. ft.	Zone 1 %	Zone 2 %	Zone 3 %	All %
1 - 100	19	32	42	32
100 - 500	25	25	42	31
500 - 1,000	25	4	4	9
1,000 - 3,000	31	25	4	19
3,000 +	-	14	8	9

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer" used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

MARKED TIMBER SALES - NOVEMBER 1998 - FEBRUARY 1999
STATEWIDE STUMPAGE

Woods Run Upland	$137-$401/M bd. ft.
Woods Run Bottomland	Insufficient Reports

*Prices supplied to District Foresters by seller, may include some veneer.

Garry D. Kepley, State Statistician
Tom Pordugal, Rick Kestle, Agricultural Statisticians

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UNIVERSITY OF ILLINOIS EXTENSION

ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

Volume 2, 1999 No. 37

IN THIS ISSUE

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and University of Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801.

The following article is a continuation in the series of **Tim's Tips** articles reprinted from the logger training manual developed by Mike Bolin, Extension Forester and Tim Ard, president of Forest Applications Training, Inc. for the ***Illinois Pro Logger Training Program***. The chain saw safety and timber felling information is useful for landowners who own and use a chain saw on their property.

USING A WEDGE TO AID IN TREE FELLING

The use of wedges in logging has a long history. The mechanics involved are quite simple. Depending on the height and diameter of the tree, it may be possible to fell it in a direction opposite of its lean with a wedge that gives no more than one inch of lift (procedure will be explained below).

Today, most wedges are made from space-age plastics. They are light-weight and do little damage to chain teeth if the saw comes in contact with them.

The wedge is used to support the weight of the tree's trunk (bole) or limbs to keep the saw from binding or for changing the direction of fall during harvesting. Learning how and when to use a wedge is not complicated, but using one can be tiring if you're not in shape!

After placing the notch in the tree's bole and setting up the hinge, the backcut is initiated *(see Illustration 1 on page 2)*. Depending

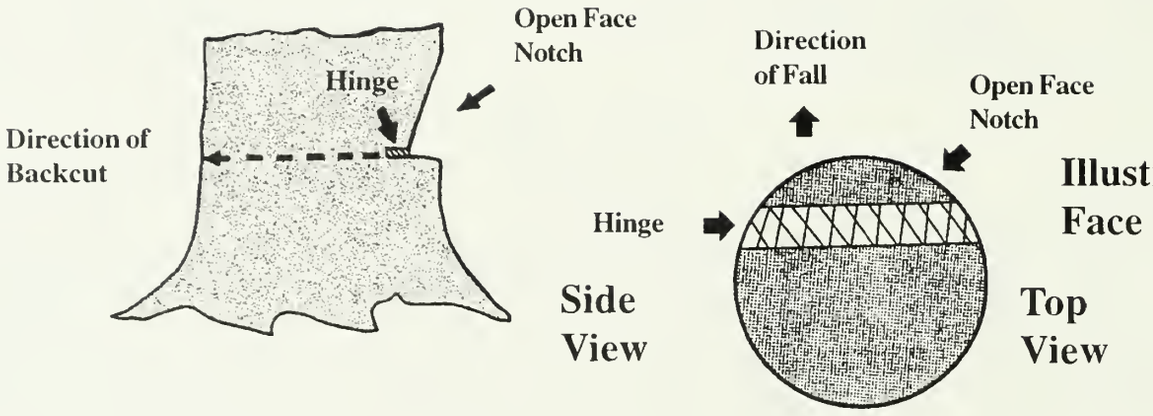

Illustration 1. The Open Face Notch and Hinge.

on the tree's size and any immovable obstructions nearby, the backcut can be made in one cut if the tree is small or in a series of cuts if the tree's diameter is greater than the length of the chain bar on the saw.

For trees with a diameter less than the bar length, the backcut is performed in one step from the good side of the tree. Tree's with a diameter larger than the chain bar require the backcut to be made in at least two steps. Here, the backcut is initiated from the tree's bad side (*When viewed from the line of fall, the bad side is the side where the tree's weighted side lean exists. It is possible to have a tree lean to one side and have the weighted lean be on opposite side because most of the limbs are found there.)* and proceeds halfway through the trunk and out the back side of the trunk *(see Illustration 2)*. The saw is removed and the logger moves to the opposite side (good side) of the tree and continues the backcut until the tree begins to fall. If there is concern that the tree may set back on (pinch) the saw's bar and chain due to weighted side- or back lean or gusts of wind, a wedge could be set in the cut on the bad side when the logger withdraws the saw and before he moves to the tree's good side to finish the cut. The wedge does not have to be driven in too far, just enough to help support the tree's weight.

Wedges are commonly used on trees with back lean—lean in the direction opposite of the intended felling direction. The wedge is used as a fulcrum to lift the weighted center of the tree past the pivot point so that it will fall in the opposite direction. How large of a wedge or how many wedges it will take to overcome a tree's back lean is fairly easy to compute. While it may be possible to overcome the back lean of many trees by using a wedge, common sense should prevail. In situations where the tree has severe back lean or trees with moderate back lean that may have rotten or dotty wood inside, it would be prudent to hire a professional arborist to remove the tree.

To compute the size of the wedge or the number of wedges that must be used to overcome a tree's back lean, some information must be collected prior to initating the backcut. It is assumed that an open face notch (70 degree opening or more) and the proper size hinge for the tree will be used. The pivot point of the tree's fall is

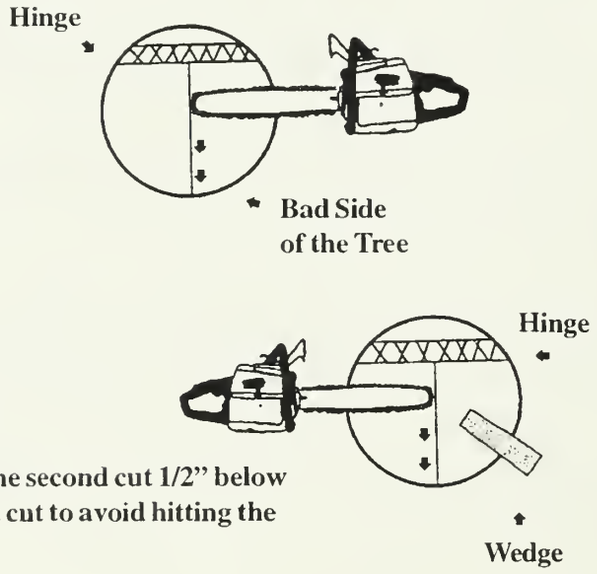

Illustration 2. The Backcut Procedure.

When a back-leaning tree is large enough that the backcut cannot be made in one cut, the cut is started from the tree's bad side, works to the center, and out the back. A wedge is set to keep the tree from sitting back on the saw and the cut is finished from the tree's good side. The wedge is used to drive the tree over in the direction of its intended fall.

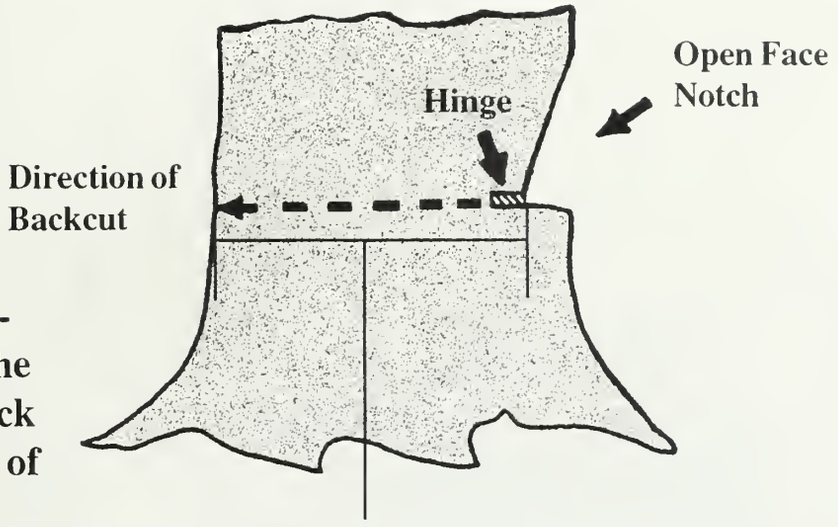

Illustration 3. To compute Measurement A, measure from the front of the hinge to the furthest point on the back side of the trunk along the direction of the backcut.

the front side of the hinge *(see Illustration 1)*. This is the point from which the first measurement is taken. Measure from the front side of the hinge to the furthest point on the back side of tree where the saw will exit the trunk. The backcut should be level and at the same height as the base of the hinge. This is **Measurement A** and it should be rounded to the nearest inch *(see Illustration 3)*.

Now, determine the total height of the tree. To do this, you will need a straight stick or rod that is equal in length to the distance between your eye and your cupped fingers when you fully extend your arm away from your body. Step away from the tree approximately 40 to 50 feet. The exact distance doesn't matter, but try to walk in a direction that will put you on the same elevation (walk the contour) as the tree's stump, and as close to 90 degrees to the direction of the tree's intended direction of fall as possible. Turn and face the tree. Now, in your mind's eye, draw an imaginary circle around the furthest reaches of the trees branches. From the center of this circle, plumb an imaginary line to the ground *(see Illustration 4 on page 4)*. Have someone mark this spot on the ground. This spot will be used to compute the tree's weighted back lean. This is the second measurement you will need to remember, **Measurement B.** We'll come back to this measurement shortly.

While you're still facing the tree, hold your arm-length stick or rod parallel to the tree's lean. Fully extend your arm and place the bottom of the stick at the base of the tree. The angle between your arm and the stick should be 90 degrees. Do not tilt the stick toward or away from you. Tilting the stick toward or away from you will distort the measurement and will cause subsequent calculation errors. Without moving your head, look up and see where the top of the tree intersects the stick. If the top is past the end of the stick, back up until the tree's top intersects the top of the stick. Conversely, if the top of the tree does not fully reach the end of the stick, move closer to the tree until the top intersects the top of the stick. Mark the spot on the ground where you are standing with your stick or a scuff mark in the dirt. Measure from this point back to the tree's trunk. This is the total height of the tree. This is the third measurement you will need to remember, **Measurement C.** *(You just used the principle of similar angles, which you learned and used in geometry. What you created was a right triangle with two, forty-five degree angles. This makes the two legs of the triangle*—the total height of the tree and the distance you're standing from the tree—*equal.)*

Now, determine the amount of back lean by measuring the distance (in inches) from the front of the hinge (back of the notch) to the point on the ground where your helper marked the imaginary plumb line. This is **Measurement B.**

The next step is to determine how many segments are in the tree. One segment is equal to the first measurement you made, **Measurement A.** You will need to convert the total height of the tree, **Measurement C,** from feet to inches. To do this, multiply the total height in feet by 12, and add the remaining inches. Now, divide the tree's total height in inches (Measurement C) by the number of inches in one segment (Measurement A). This figure equals the total number of segments in the tree.

Your probably saying, I don't understand this segment thing. Well imagine a segment as a square with its sides equal to your "Measurement A" distance. If the tree has, say, 70 segments in it, imagine 70 squares stacked on top of each other laying parallel to a line running up the middle of the tree's trunk *(see Illustration 5 on page 5)*.

If you were to backcut the tree properly and insert a 1-inch (thick) wedge at the furthest back point on the stump to support the tree, you now want to know how far forward (direction opposite of tree's lean) you can move the center point of the tree's weighted back lean using this wedge. ***Remember—for the tree to fall in the***

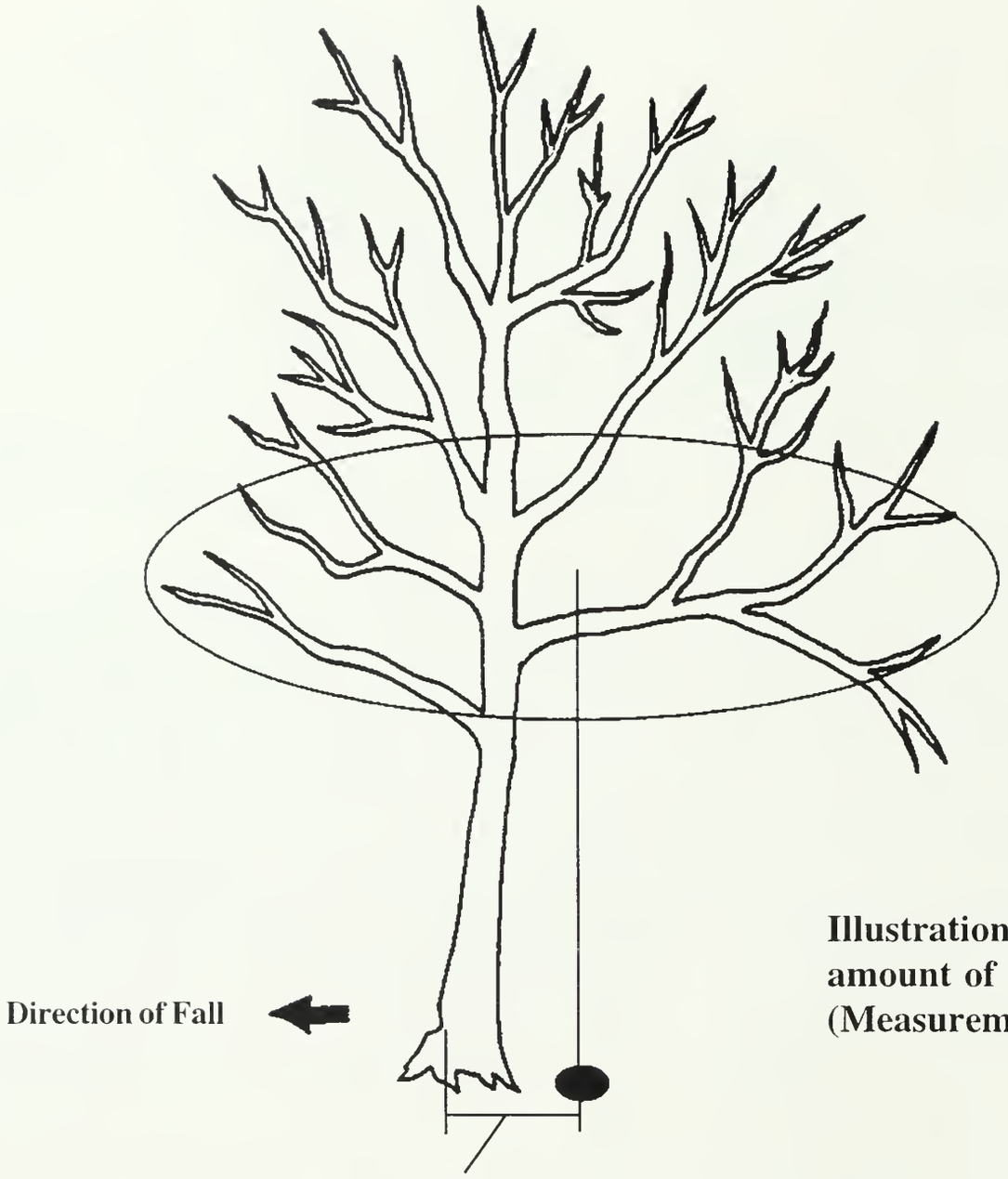

Illustration 4. Determining the amount of weighted back lean (Measurement B).

Measure the Distance from the Front of the Hinge (Back of the Notch) to the Plumb Line Spot on the Ground in Inches. This is Measurement B.

direction opposite of it's lean, you have to move the weighted center of the tree past the pivot point (an imaginery line running vertical above the front of the hinge). If you were to drive the wedge in until it is flush with the tree's trunk, you would lift the back corner of the first segment (square) one inch. Correspondingly, this would move the opposite corner one inch toward the direction you want the tree to fall *(see Illustration 5)*. But, how many inches did the opposite corner of the second square (segment) move? If you said two inches, you're correct. How many inches did the opposite corner of the seventieth section move toward the direction of fall? Seventy inches. Therefore, you know that in this example a one-inch wedge will lift or move the top of this 70 segment tree 70 inches in the opposite direction. If, in this example, Measurement B is less than 70 inches, only one, 1-inch wedge would be needed to lift the top of the tree past the center pivot point, thus allowing the tree to fall in the direction opposite of its lean.

What does this tell us about the ability to wedge different size trees of the same height? Smaller diameter trees (trees with a smaller Measurement A) will have more segments and, therefore, can be wedged (lifted) further than a larger diameter tree of the same height.

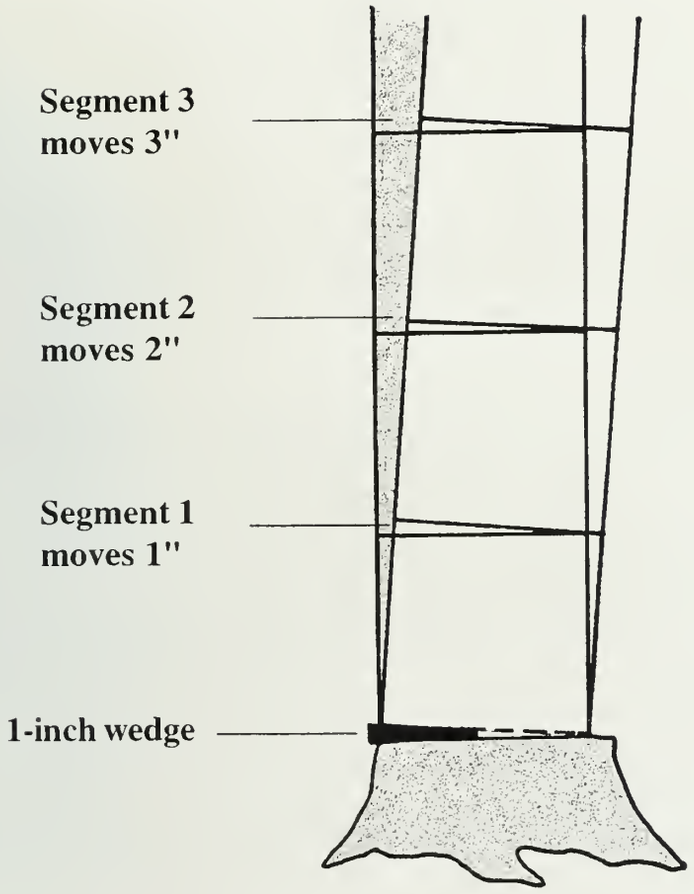

Illustration 5. The amount of lift provided by a 1-inch wedge.

For example, a tree with a 6-inch base (Measurement A) that is 70 feet tall would have 140 segments, and a 70-foot tree with an 18-inch base (Measurement A) would have 46 segments. Consequently a 1-inch wedge will move the top of the 6-inch tree 140 inches, while the 18-inch tree's top will move only 46 inches using the same wedge.

You can easily determine how many wedges will be needed to overcome a tree's back lean. Using more than two wedges is not advisable for safety reasons. If you find that you'll need two wedges to compensate for the back lean, don't stack the wedges directly top of the other. If you do this, striking one will cause the other one to shoot out like a guided missile possibly striking you or any object in the immediate vicinity. The wedges should be stacked on each other, but at approximately 70 degrees to each other. Alternate striking each wedge until the tree is lifted past its center pivot point and begins its fall. At that point, you should begin your retreat to a point at least 15 feet behind the stump in a direction 135 degrees away from the direction of fall *(see Illustration 6).*

Turning the wedge sideways and moving it closer to the hinge will make the base of the tree smaller by moving the lifting point closer to the hinge. Therefore, it is easy to increase the number of seg-

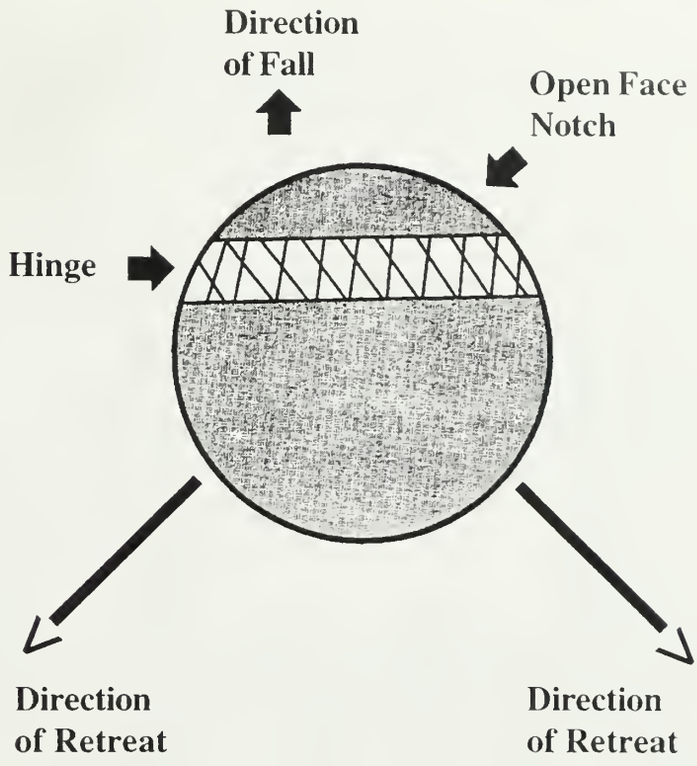

Illustration 6. Retreat Route Direction.

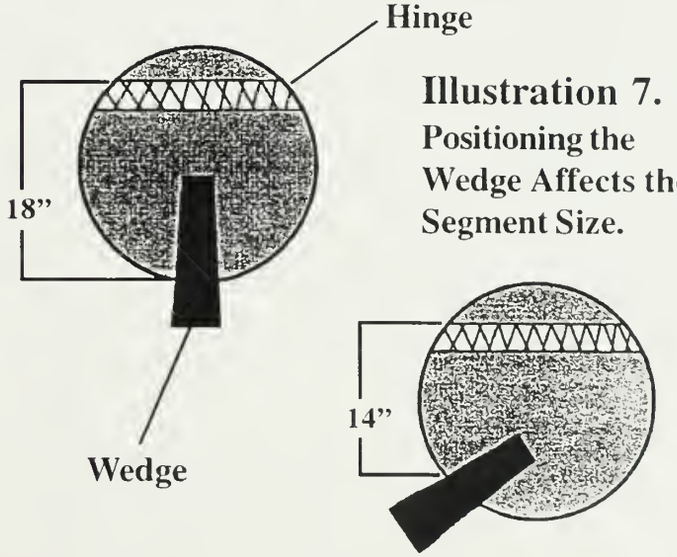

Illustration 7. Positioning the Wedge Affects the Segment Size.

Turning the wedge and moving it closer to the hinge decreases the segment size. This increases the number of segments in the tree making it possible to overcome greater back lean with less lift from the wedge provided the weight of the tree is not prohibitive.

ments in a tree. However, this also makes it harder to drive the wedge and move the tree's weighted center of gravity. Heavy trees will make it extremely difficult to drive the wedge (refer to *Illustration 7 on page 5).*

Use the following tables to determine how many 1-inch wedges will be necessary for your tree, or do the calculations yourself if your tree is of a size that is different than is listed here.

Trees 50' in height

Diameter	Amount of back lean overcome with a 1-inch wedge
6"	100"
8"	75"
10"	60"
12"	50"
14"	42"
16"	37"
18"	33"
20"	30"

Trees 60' in height

Diameter	Amount of back lean overcome with a 1-inch wedge
6"	120"
8"	90"
10"	72"
12"	60"
14"	51"
16"	45"
18"	40"
20"	36"

Trees 70' in height

Diameter	Amount of back lean overcome with a 1-inch wedge
6"	140"
8"	106"
10"	84"
12"	70"
14"	60"
16"	53"
18"	46"
20"	41"

In the next issue, **Tim's Tips** will focus on *"How to Minimize Fiber Pull and Splitting"* and on *"Small Tree Felling"*.

TAX TIPS FOR FOREST LANDOWNERS FOR THE 1999 TAX YEAR

by Larry M. Bishop, Forest Management and Taxation Specialist, USDA Forest Service, Atlanta

The following article is reprinted from the USDA Forest Service Southern Region's Cooperative Forestry Technology Update, *December 1999, Management Bulletin R8-MB 86* .

Here is some information to keep in mind when you prepare your 1999 Federal income tax return. This discussion is necessarily brief, and you should consult other sources for a more comprehensive treatment of the issues. This information is current as of December 1, 1999.

Basis and Tax Records

Part of the price you receive from a timber sale is taxable income, but part is also your investment (i.e., basis) in the timber sold. Allocate your total costs of acquiring purchased forestland—or the value of inherited forestland—among land, timber, and other capital accounts as soon as possible. Adjust this basis up for new purchases or investments and down for sales or other disposals. When you sell your timber, you can take a depletion deduction equal to ([Adjusted basis ÷ Total timber volume just before the sale] x [Timber volume sold]). Good records include a written management plan and a map of your forestland. Keep records that support current deductions 6 years beyond the date the return is due. Keep records that support your basis 6 years beyond your period of ownership. Report basis and timber depletion on Form T (Timber), Schedule B.

Passive Loss Rules

The passive loss rules continue to be a real puzzle for forest landowners. This subject is too complex to cover in detail here, but what follows is a very brief summary. Under the passive loss rules, you can be classified in one of three categories: (1) investor, (2) passive participant in a trade or business, or (3) active participant (materially participating) in a trade or business.

The law's intent is that you are "materially participating" if your involvement is regular, continuous, and substantial; however, a low level of activity is adequate if that level is all that is required to sustain the trade or business. This means that record keeping is very important! To show material participation, landowners will need to keep records of all business transactions related to managing their timber stands. Likewise, it would be a good idea to keep records of other business-related activities such as landowner meetings attended, odometer readings to and from meetings, cancelled checks for registration fees, and copies of meeting agendas. Generally, you will get the best tax advantage if you are "materially par-

ticipating" in a timber business because all management expenses, property taxes, and interest on indebtedness is fully deductible against income from any source. However, if you are "materially participating," you must dispose of your timber under the provisions of Section 631 to qualify for capital gains. (This means that you must sell your timber on a "pay-as-cut" or "cut and convert" basis, rather than lump sum.) On the other hand, if you have considerable passive income (such as Conservation Reserve Program annual rental payments), it may be to your advantage to be considered "passive." Most of the discussion that follows applies to forest landowners who are "materially participating."

Reforestation Tax Credit and Amortization *(also discussed in* IL Forest Management Newsletter, *Vol. 1, 1999 No. 36)*

The reforestation tax credit and 7-year amortization is one of the best tax advantages for forest landowners. If you reforested during 1999, you can claim a 10-percent investment tax credit for the first $ 10,000 you spent for reforestation during the tax year. In addition, you can amortize (deduct) all of your 1999 reforestation costs (up to $10,000), minus half the tax credit taken, over the next 7 years (actually 8 tax years). The election to amortize must be made on a timely tax return for the year in which the reforestation expenses were incurred. Elect to amortize reforestation expenses on Form 4562. (Passive owners may or may not be eligible for the amortization and credit).

Here's how it works. Assume you spent $4,000 to reforest a cutover tract in 1999. You claim a $400 tax credit (10 percent of $4,000) for 1999. You can also deduct 95 percent of these reforestation costs over the next 8 tax years. Due to a half-year convention you can only claim one-half of the annual amortizable portion for 1999. This means that on your 1999 tax return you can deduct one-half of (0.95 x $4,000 ÷ 7) or $271. For the next 6 tax years you can deduct (0.95 x $4,000 ÷ 7) or $543, and the remaining $271 can be deducted the 8th tax year.

The annual reforestation amortization is claimed on Form 1040 on the line for adjustments rather than being claimed on Schedule A under miscellaneous deductions. (If you use Schedule A for this purpose, you can claim only aggregated miscellaneous deductions that exceed 2 percent of adjusted gross income). Use Form 3468 to claim the investment tax credit.

Any reforestation costs exceeding the $10,000 annual limit must be capitalized (entered into your timber account). You can recover (deduct) these costs when you sell your timber.

A final word of caution: the tax credit and 7-year amortization deductions are subject to recapture if you dispose of your trees—within 5 years of planting for the credit and within 10 years of planting for the amortization.

Capital Gains and Self-employment Taxes

If you report your timber sale income as ordinary income, you could pay significantly more in taxes than you would if you report it as a capital gain. Also, capital gains are not subject to the self-employment tax, as is ordinary income. The net self-employment tax rate for 1999 is 15.3 percent for self-employment income of $400 or more. The rate consists of a 12.4 percent component for old age, survivors, and disability insurance (OASDI) and a 2.9 percent component for hospital insurance (Medicare). The maximum income subject to the OASDI component of the tax rate is $72,600, while the Medicare component is unlimited. However, if wages subject to Social Security or Railroad Retirement tax are received during the tax year, the maximum is reduced by the amount of wages on which these taxes were paid. To qualify for long-term capital gains treatment, timber sold after December 31, 1997 must have been held longer than 12 months. The maximum long-term capital gains rate for 1999 is 20%. (For taxpayers in the lowest income bracket, the maximum rate is 10%).

Cost-share Payments

If you received cost-share assistance under one or more of the Federal or State cost-share programs during 1999, you may have to report some or all of it as ordinary income. You have several options. You have the option to include it as income and then recover the part that you pay plus the cost-share payment through the amortization and reforestation tax credit already described. You also have the option to exclude the "excludable portion" from income if certain conditions are met. These conditions are (1) the cost-share program has to be approved for exclusion by the IRS and (2) the maximum amount excludable per acre is the greater of: (a) the present value of $2.50 per acre or (b) the present value of 10 percent of the average income per acre for the past 3 tax years. This second requirement gets rather complicated because you have to determine an appropriate interest rate to compute the present values. Programs approved for exclusion by the IRS include the Forestry Incentives Program (FIP), the Forest Stewardship Incentive Program (SIP), the Wetlands Reserve Program (WRP), the Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP), plus several State programs (check with your State Forestry Agency for approved programs in your State).

Generally, if you harvested the tract within the last 3 years, probably all of the cost-shares received can be excluded from income. In some cases, taxpayers may be better off to exclude cost-share payments. Other taxpayers may be better off not to exclude cost-share payments. Instead, they may be better off to claim the cost-share payments as part of the reforestation tax credit/7-year amortization. The important point here is: **You must report cost-share payments.** If you decide to exclude cost-share payments, attach a statement to your return that states specifically what cost-share payments you received, that you choose to exclude some or all of them, and how

you determined the excludable amount.

Conservation Reserve Program

If you planted trees during 1999 under the Conservation Reserve Program (CRP), you must report your annual payment as ordinary income. If you received CRP cost-share assistance funds for planting your trees, you must also report these as ordinary income. CRP cost-share payments used to establish trees can be claimed as part of the reforestation expenses reported for the reforestation tax credit/7-year amortization.

Farmers may treat expenditures for soil and water conservation on farmland as expenses in the year incurred, rather than capitalizing them (CRP expenditures qualify). However, the amount deductible in any year shall not exceed 25 percent of the gross income from farming.

Casualty Losses

A casualty loss must result from some event that is (1) identifiable, (2) damaging to property, and (3) sudden and unexpected or unusual in nature. Examples include wildfire and storms. Generally, your claim for casualty losses can be no more than the adjusted basis minus any insurance or other compensation.

The IRS has issued position statements on southern pine beetle losses in timber stands and drought losses of planted seedlings. In both cases, the IRS stated that, generally, neither circumstance qualified for casualty-loss deductions because they failed to meet the suddenness standard. It may be possible, however, to take a business- or investment-loss deduction for both types of damage.

Management and Maintenance Expenses

Generally, your annual expenses for the management and maintenance of an existing stand of timber can be expensed or capitalized. In most cases, you are better off to expense those costs during the tax year they are incurred, rather than capitalizing them. If it is not to your advantage to itemize deductions for 1999, you should capitalize these expenses. If you choose to itemize deductions, you can deduct these expenses, but the passive loss rules apply.

Conclusion

Remember these points when you file your 1999 Federal income taxes:

1. Decide if you are going to be an active or passive participant or an investor. Generally you will get the best tax advantage if you are active.

2. Establish your basis as soon as possible and keep good records! Records include a management plan and map, receipts for business transactions, diaries, and landowner meeting agendas.

3. If you had reforestation (timber stand establishment) costs, be sure to consider the 10 percent reforestation tax credit/7-year amortization.

4. If you sold timber during 1999, you maybe able to benefit from the long-term capital gains provisions because you do not have to pay self-employment tax on capital gains.

5. If you had cost-share assistance during 1999, you must report it to the IRS. You may choose to exclude some or all of it, if certain qualifications are met, but you still must report it.

6. If you participated in the CRP, your annual payments must be reported as ordinary income. Likewise, if you received CRP cost-share assistance funds, you must report them as ordinary income.

7. Proper tax planning is just as important as the management techniques to grow a profitable timber crop. For help, contact a professional tax advisor, the Cooperative Extension Service, or your State forestry agency.

EDITOR'S NOTE - *If you have a question related to timber taxation, we suggest you visit Purdue University's timber tax management web site. This is a comprehensive site that also includes links to all the necessary Federal and State income tax forms for use by forest landowners. The web site address is:*
http://www.fnr.purdue.edu/ttax/

Tri-State Forest Landowner Conference Scheduled for March, 2000

On Saturday, March 18, 2000, forest landowners who live in the IL-IA-WI tri-state area are invited to attend the 6th annual Tri-State Forest Stewardship Conference held at Sinsinawa Mound Conference Center in Sinsinawa, WI. The conference program agenda is presented on the adjoining page of this newsletter. Landowners interested in attending may use the registration form at the bottom of the next page. Last year, over 550 people attended this conference making it one of the largest forest landowner conferences in the nation. This year's program agenda makes the 2000 conference equally exciting and informative. The conference registration fee is $35.00 for the first registrant and $25.00 for each additional family member. The registration fee includes a continental breakfast, buffet luncheon, break refreshments, and a conference resource packet. Pre-registration is required. The registration deadline is March 1, 2000.

Tri-State Forest Stewardship Conference
Saturday, March 18, 2000
Sinsinawa Conference Center, Sinsinawa, WI

Conference Program Agenda

(Preregistration Required - No Walk-in Registration)

7:30-8:30 a.m. Conference Check-in and Continental Breakfast

8:30-9:15 a.m. Welcome and Conference Orientation.
Keynote Address by *Keith Argow, President, National Woodland Owners Association*

9:30-10:30 a.m. Concurrent Session 1

1. "Alleycropping—An Agroforestry Alternative"
2. "Directional Felling Techniques and Safe Chain Saw Use" (outdoors)
3. "Exotics (Plants)—Coming to a Woodland Near You"
4. "Mechanics of Tree Pruning"
5. "Properties and Uses of Native-grown Hardwoods"
6. "Identifying and Enhancing Wetlands on Your Property"

10:45-11:45 a.m. Concurrent Session 2

7. "Nut Production—An Alternative Income Opportunity"
8. "Successful Tree Planting"
9. "Exotics (Plants)—Coming to a Woodland Near You" (repeat)
10. "Converting Your Trees Into Cash (Wood Products)"
11. "Discouraging Damage from Nusiance Wildlife"
12. "Recordkeeping for Forest Landowners"

12:15-1:15 p.m. Concurrent Session 3

13. "Fine Hardwood Plantation Management"
14. "Chain Saw Maintenance and Chain Sharpening"
15. "Weed Control in Tree Plantations"
16. "Forest Landowner Associations—The Importance of Belonging"
17. "Managing Your Land for Small Mammals"
18. "Portable Sawmill Demonstration" (outdoors)

1:15-2:30 p.m. Buffet Luncheon

2:30-3:30 p.m. Concurrent Session 4

19. "Leased Hunting—An Alternative Income Opportunity"
20. "Crop Tree Identification and Management"
21. "Understanding Basic Tree Physiology and Growth"
22. "Best Management Practices When Constructing Forest Roads and Trails"
23. "Recordkeeping for Forest Landowners" (repeat)
24. "How to Plan and Host Youth Field Days on Your Property"

3:45-4:45 p.m. Concurrent Session 5

25. "Growing Herbals—An Alternative Income Opportunity"
26. "Directional Felling Techniques and Safe Chain Saw Use (repeat, outdoors)
27. "Establishing Trees by Direct Seeding"
28. "Understanding Tree and Land Measurements"
29. "Discouraging Damage from Nuisance Wildlife" (repeat)
30. "Forest Landowner Associations—The Importance of Belonging" (repeat)

4:45 p.m. Adjourn

I'm interested in attending the 2000 Tri-State Forest Stewardship Conference.

Please send me registration information.

Name: _____

Address: _____

City _____ **State** _____ **Zip** _____

Return to: Judy Stoll, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801; phone 217-333-3650.

Registration Deadline: March 1, 2000

Illinois Agricultural
Statistics Service
P.O. Box 19283
Springfield, IL 62794-9283
Ph (217) 492-4295
U.S. Department of Agriculture

ILLINOIS TIMBER PRICES

DIVISION OF FOREST RESOURCES
600 North Grand Avenue West
Springfield, Illinois, 62706
Phone (217) 782-2361

DEPARTMENT OF
NATURAL
RESOURCES

November 23, 1999

PRICES PAID ILLINOIS TIMBER PRODUCERS
MAY 1999 THROUGH AUGUST 1999

Summer sawtimber prices paid to Illinois timber growers generally showed mixed trends for F.O.B. Mill and stumpage compared to both the previous winter and summer. Of the timber buyers reporting volume of their 1999 operations, 48% indicated their volume was 500 thousand board feet or more.

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones, based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS
SAWTIMBER - $ PER M BD. FT.

SPECIES	May 1998 - August 1998		November 1998 - February 1999		May 1999 - August 1999	
	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
Ash	160	310	160	300	160	270
Basswood	90	210	100	250	110	200
Beech	70	160	80	200	75	170
Cottonwood	60	160	55	160	65	150
Sweet Gum	80	180	80	180	75	180
Elm & Hackberry	70	180	75	180	75	180
Hickory	80	220	100	240	110	200
Soft Maple	120	240	100	240	110	200
Sugar Maple	190	300	160	320	170	280
Black Oak	170	310	170	300	160	260
Pin Oak	85	180	85	200	95	180
Red Oak	260	410	220	360	230	360
White Oak	250	390	220	360	230	350
Yellow Poplar	130	230	140	280	120	290
Sycamore	70	180	70	170	80	180
Black Walnut	350	480	350	510	330	500
Woods Run Bottomland	100	210	100	210	90	190
Woods Run Upland	180	270	150	250	150	260
FACE VENEER - $ PER M BD. FT.						
Red Oak	530	890	480	920	610	910
White Oak	820	1,530	970	1,660	1,010	1,670
Walnut	1,550	2,780	1,390	1,940	1,720	3,120
COOPERAGE - $ PER M BD. FT.						
White Oak	300	580	280	450	290	550
UNPEELED PULPWOOD - $ PER TON						
Ton	3.20	19.70	3.00	19.50	3.00	21.00

Timber Prices
May 1999 - August 1999
November 23, 1999

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
May 1999 - August 1999

PRODUCT	UNIT	Zone 1		Zone 2		Zone 3	
		Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
1. Sawtimber				Dollars			
Ash	M bd. ft.	100-200	190-400	70-300	180-400	50-300	150-350
Basswood	M bd. ft.	75-100	150-190	70-90	150-200	50-200	150-500
Beech	M bd. ft.	50-100	170-200	N/A	140-160	50	120-160
Cottonwood	M bd. ft.	50-80	130-200	50-100	140-200	50	100-160
Sweet Gum	M bd. ft.	50-100	170-230	60-80	140-180	50	120-160
Elm & Hackberry	M bd. ft.	50-100	140-230	60-100	140-200	50-70	120-250
Hickory	M bd. ft.	70-150	190-250	50-220	150-300	50-100	120-170
Soft Maple	M bd. ft.	50-100	150-300	50-150	160-280	70-200	150-250
Sugar Maple	M bd. ft.	100-200	190-450	60-300	180-400	150-300	160-325
Black Oak	M bd. ft.	100-200	190-400	60-300	180-450	50-250	160-250
Pin Oak	M bd. ft.	50-100	170-230	60-200	140-200	50-150	120-200
Red Oak	M bd. ft.	100-300	190-550	85-350	180-500	40-350	160-500
White Oak	M bd. ft.	100-250	190-500	80-500	180-500	150-400	160-550
Yellow Poplar	M bd. ft.	100-200	200-400	130-150	250-300	50	N/A
Sycamore	M bd. ft.	50-100	150-200	50-150	160-200	50	120-250
Black Walnut	M bd. ft.	200-250	250-500	200-500	600-650	250-500	400-950
Woods Run Bottomland	M bd. ft.	60-120	160-230	50-120	190-200	25-150	120-175
Woods Run Upland	M bd. ft.	90-200	180-450	60-200	180-330	125-350	250

		STATEWIDE	
		Stumpage	F.O.B. Mill
2. Face Veneer			
Red Oak	M bd. ft.	400-850	600-1,400
White Oak	M bd. ft.	500-1,750	1,200-2,265
Walnut	M bd. ft.	1,000-3,000	2,200-4,050
3. Cooperage			
White Oak	M bd. ft.	150-400	300-800
4. Pulpwood			
Unpeeled	M bd. ft.	2.00-4.00	20.00-22.00

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	100
Scribner	-
International	-

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rated Reported $/M bd. ft.
Zone 1	13	150-190
Zone 2	26	120-300
Zone 3	14	200
Illinois	19	120-300

VOLUME OF 1997 OPERATIONS

Size in (000) bd. ft.	Zone 1 %	Zone 2 %	Zone 3 %	All %
1 - 100	-	24	58	26
100 - 500	31	24	25	26
500 - 1,000	15	19	17	17
1,000 - 3,000	54	9	-	20
3,000 +	-	24	-	11

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer" used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

MARKED TIMBER SALES - MAY 1999 - AUGUST 1999

	STATEWIDE STUMPAGE
Woods Run Upland	$102-$341/M bd. ft.
Woods Run Bottomland	Insufficient Reports

*Prices supplied to District Foresters by seller, may include some veneer.

Garry D. Kepley, State Statistician
Tom Pordugal, Rick Kestle, Agricultural Statisticians

"Printed by authority of the State of Illinois, "11/23/99, 1,700, 2391

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ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

Volume 1, 2000 No. 38

IN THIS ISSUE

Asian Longhorned Beetle,
US Forest Service NE Area S&PF

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and University of Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801.

Photo by James Appleby, Univ. of Illinois

ASIAN LONGHORNED BEETLE

The First Real Threat to America's Forests in the 21st Century?

A potential serious insect enemy of America's hardwood forests poses the first major threat of the 21st century. The Asian longhorned beetle [ALB] (*Anoplophora glabripennis*) has arrived from China where this beetle is a serious pest of hardwood trees and has few natural enemies. In the United States, it has no natural enemies. It is believed to have arrived in the U.S. through infected dunnage imported from Asia. Populations of this insect first became noticed in Brooklyn, NY in 1996 and have spread to warehouse and residential sites in 14 states around the country. The Chicago metro area has three confirmed ALB sites (Ravenswood community in the city of Chicago, DuPage County near Addison, and the Village of Summit) and strict quarantine has been placed on these areas to help prevent the beetle from spreading. APHIS (USDA Animal and Plant Health Inspection Service) has determined that the beetle is hitchhiking its way into the United States in solid wood packing

materials, such as pallets and crates, from infested areas of China. Similarly, infested wood that is harvested here and transported to other locations is spreading the beetle.

Why is ALB a Serious Threat to America's Hardwood Forests?

As far as is known, ALB, so far, remains a threat to urban and city forests since this is where it was first introduced in shipping materials at warehouses. However, the beetle could quickly spread to woodland areas if infested wood is transported to other areas or adult beetles are inadvertently transported to rural forested areas. Infested areas in China where beetle populations pose a serious threat have climate conditions very similar to the US's eastern hardwood forest region. As mentioned above, ALB has no known natural enemies in the U.S. And, because the insects spend all but the summer months inside the tree, it is virtually impossible to eradicate them with insecticides. The only way to eradicate the beetle is to remove and destroy infested trees. Removal of susceptible trees in the immediate vicinity of the infested trees as a buffer is also recommended in certain situations. This is similar to how oak wilt infection is handled in woodland situations.

Since there are no know natural enemies of this beetle, if it becomes established, it could quickly explode into a major problem for forest landowners. ALB spread quickly when they get into an area with suitable host trees. In the U.S., the beetle prefers maple species (Acer sp.) including boxelder, Norway, red, silver, sugar and sycamore maples. Other knows hosts are horsechestnut, black locust, elms, birches, willows, poplars, mulberry, and green ash. It may attack other hardwoods as well, but limited experience with the beetle in the U.S. has resource managers worried. Since sugar maple is one of the most valuable trees in the eastern United States and the major species tapped for the commercial production of maple syrup, the threat to our forests is very real. Hard maple wood, especially in the birds-eye or curly form, is highly prized for furniture, paneling, flooring, and many other uses.

Typically, ALB attacks a single tree at first eating until they exhaust it as a food source. Then they spread to nearby trees. Under its own power, this beetle can fly hundreds of feet. With wind assistance, it can go even further. Landowners and homeowners unintentionally spread the beetle by cutting or trimming and infested tree and removing the wood elsewhere.

What Other Than Destroying Infested Trees is Effective?

APHIS is planning to conduct field test to determine whether the systemic insecticide, imidacloprid (its commercial name is Merit® 75WP) will be useful in stopping the spread of the ALB. Preliminary testing of systemic insecticides against wood-boring insects in China has warranted the U.S. field tests by APHIS. Imidacloprid has shown promise for effective use in an operational program. Preliminary testing indicates some activity of imidacloprid against adult beetles as they feed on small twigs and possibly when the female beetles chew into the bark and phloem area to deposit their eggs. Systemic insecticides usually work by making the treated plant either unpalatable to the target pest or poisonous. Imidacloprid is effective in controlling some beetles. The insecticide works by interfering with the beetle's nervous system resulting in its paralysis and eventual death. APHIS plans to evaluate the delivery of this insecticide into the tree by soil injection and trunk injection.

The question has already been posed on what affect a systemic insecticide might have on sap collected for maple syrup production. Effects on such trees would certainly have to be evaluated and studied before they were treated in this manner. There are no plans at this time to treat or evaluate commercial maple trees. Testing is limited to the infested areas in New York and Chicago.

One natural enemy of ALB is entomopathogenic nematodes and could become an effective control agent. Testing has shown the ALB mortality reached 61-94% when infected with various strains of *Steinernema bibionis* (Qin et al., 1988).

What is the Life Cycle of the ALB?

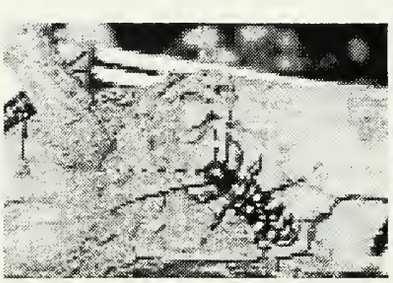
The typical life cycle of this beetle is:

Egg — Larva — Pupa — Adult

Let's look at each of these life stages a little closer.

Adult Stage

Asian longhorned beetles are big, showy insects that are readily recognized by their antennae (or 'horns'). The adult beetles are ¾ -inch to 1 ½ -inches in length and a ¼ -inch to ½ -inch in width. The females are larger than the males. Their color is jet-black with a glossy sheen and they have distinctive white dots on their back. Their antennae have 11 segments. The base of antennae is whitish with a blue-black color. The antennae of the male beetle are 2.5 times their body length; the antennae of the females are 1.3 times the body length. Their feet have a bluish tinge.



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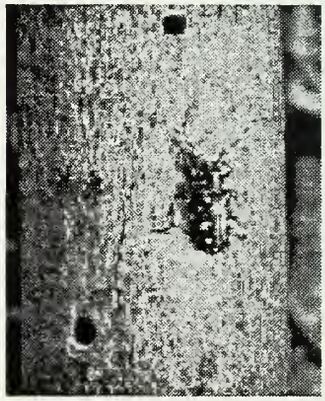
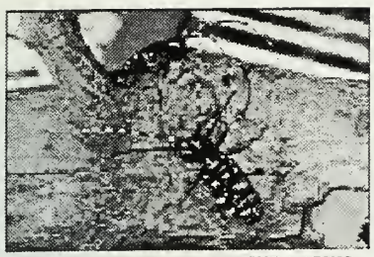


James Appleby/Univ. of IL



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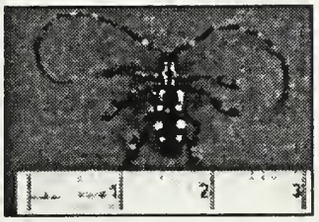
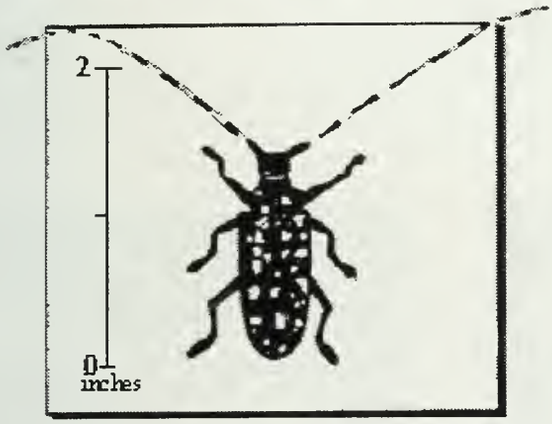


USFS NE AREA S&PF -NC

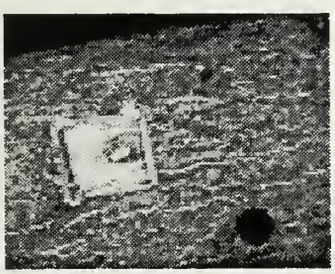


IL Dept. of Agriculture

James Appleby/Univ. of IL

Egg Stage

Female beetles are capable of laying 50-70 eggs. Females chew an oviposition depression into the bark of the tree and deposit one egg per depression in the phloem area. The eggs are off-white in color and roughly a ¼ - inch in length. Both ends of the eggs are slightly concave.

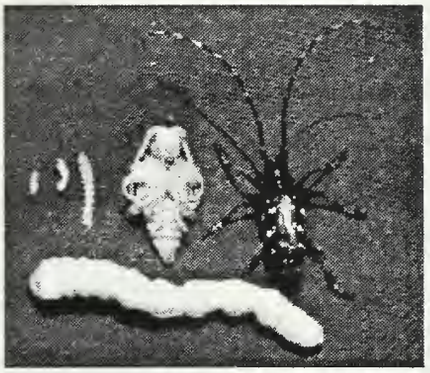


James Appleby/Univ. of IL

Bark removed showing one ALB egg

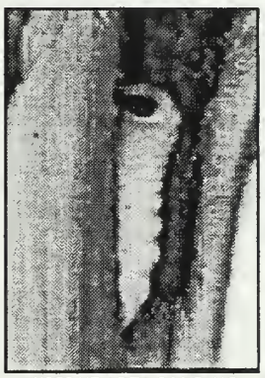
Larval Stage

Mature larvae are 2-inches in length. Its immense size makes it is easy to see why it is so destructive once larvae get established in a tree. The prothorax has a brown mark. The front of the mark does not have a brown margin.



USDA APHIS

Life stages of ALB: egg, larval instars, pupa, and adult



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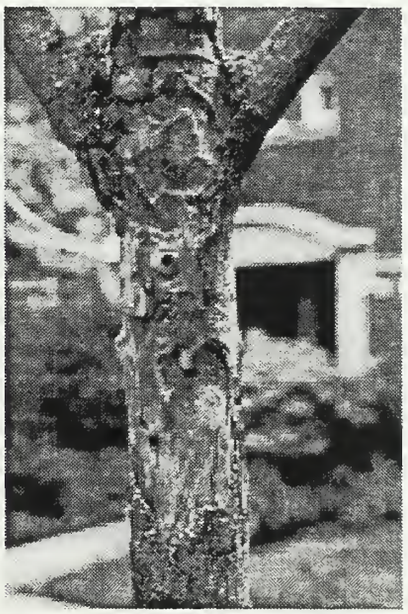


James Appleby/Univ. of IL

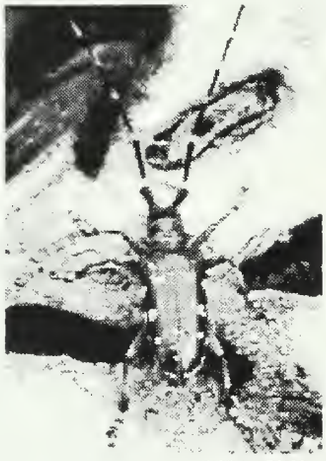
Larva and Larvae Damage

Pupal Stage

Pupae are off-white and are 1 ¼ -inch in length and 3/8 –inch in width.

Pupa in tunnel USDA APHIS

In China, ALB has one or two generations per year. In the U.S., one generation is likely. ALB can overwinter as an egg, as a larva developed within an egg, as a larva, or as a pupa. (In China) The egg stage lasts about 11 days and occurs in June-July (one generation per year) and September-October (one generation per 2 years). The first three larval instars feed in the phloem area and the late 3rd and 4th larval instars tunnel back into the xylem of the tree feeding on the heartwood. The adults emerge beginning in May and peak population occurs in early July. The adults emerge through 3/8-inch (dime-size) holes that they chew through the bark, a telltale sign that this insect is present. Heavy sap flow occurs from these large trunk and branch wounds. Accumulation of coarse sawdust around the base of infested trees, where branches meet the main stem, and where branches meet other branches are signs that the tree is likely infested with beetle larvae that are boring into and feeding on the trunk and branches. Female adults live 14-66 days and males live 3-50 days. Adults fly for 2-3 days during which they feed and mate. To lay eggs, the adult females make a pit on the branches where the new shoots arise. The pits are round and may appear oval or lip-shaped. One egg is deposited in each depression and the early-stage larva that develops feeds between the phloem and the xylem. This feeding causes the tree bark to become concave. The late-stage larvae feed only in the xylem and bore into the trunk to over-winter. In early June of the following year, the larvae become pupae and then finally adults through the summer months.



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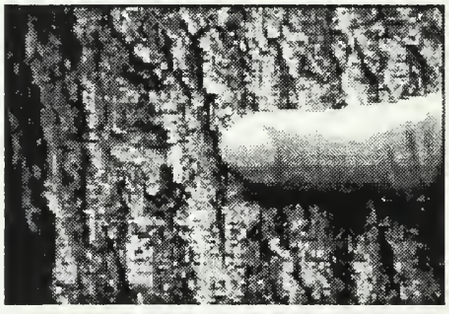

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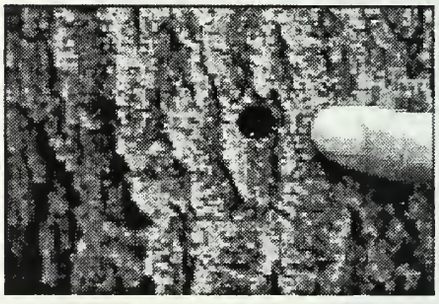
Oviposition Depression



USFS NE AREA S&PF

Dime-size Emergence Hole

Be On the Lookout for Asian Longhorned Beetle!

What can you do if you suspect you have ALB in trees on your property? If you think you have found ALB on your property, call your APHIS PPQ State plant health director at this number 708-299-0024 or the Illinois Department of Agriculture hot-line number at 1-800-641-3934.

Information Courtesy of: APHIS, US Forest Service State and Private Forestry, and IL Department of Agriculture.
Photos Courtesy of: APHIS, US Forest Service State and Private Forestry, IL Department of Agriculture, and James Appleby/University of Illinois.

Financial Maturity: A Guide To When Trees Should Be Harvested

W. L. Mills, Jr. and John C. Callahan
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Financial maturity is a concept which provides for the maximization of monetary returns from an investment in an appreciating asset (one increasing in value over time). The financial maturity calculation requires that the investment opportunity at some point in its life meet the owner's profitability objective. Therefore, it is necessary that the investment be an acceptable one to the investor based on an analysis of its net present worth or internal rate of return.1

Financial maturity, then, is the point in the life of an appreciating asset when the owner's cost of keeping an asset exceeds the expected monetary gain. Timber, some wines, bonded distilled liquors, and livestock can be categorized as appreciating assets. All have character-

tastes and preferences of the consuming public for wood products or for given species.

The first two types of value increases are direct related to the growth potentials of trees. These are predictable and can be estimated with some reliability by foresters. The relative value changes are more difficult to judge because of the inability to accurately predict future trends and because of the inherent uncertainty associated with any forecast. Assumptions can be made that there will be no change in the relative prices during the investment period being considered (the assumption made in this publication), that relative price changes will follow observable past trends, or that the future price relationships are those anticipated or expected by the investor using perceptive intuition or a crystal ball.

Anticipated Costs

Explicit costs such as property taxes, management expenses, and service fees can be estimated for a given forested property by examining past records of these expenses. Normally, these costs are considered to be out-of-pocket expenses paid annually or periodically during an investment period. Explicit costs which are annual and constant, as is the case of ad valorem property taxes, can be ignored in this search for financial maturity. 4

Implicit costs are sometimes not easily understood since they are not as obvious as out-of-pocket charges. The principal implicit cost in the case of timber production is the cost of holding the standing inventory of timber. During the investment period, trees accumulate wood which has a market value. This is inventory in the same context as stored grain and shelved items in a retail store. The principal cost of holding this inventory is the potential return which could have been earned if the value of that inventory had been invested alternatively. This "opportunity" cost forms the basis for determining the individual's alternative rate of return as was indicated previously.

Financial Maturity of an Individual Tree

The General Case

In uneven-aged stands managed for timber production, individual trees should be selected for harvest as they become mature. The financial maturity concept is ideally suited for the purpose of determining "maturity" if maximization of net revenues is the decision-making criterion. Figure 2 (5) represents the typical value growth percent (VGP)6 pattern for an individual tree. VGP measures the rate of value increase in the discounted net revenue curve (Figure 1); however, the VGP may be calculated without drawing such a graph. The value growth percent is modest when the tree is small in diameter because the value per unit of wood is low, and the volume is small. In the diameter range of 12 to 16 inches, the VGP initially rises sharply because unit values increase rapidly as the tree increases in volume and quality. The VGP then falls as the implicit costs associated with holding the tree increase. Implicit cost increases as tree value increases. There may be a second rise in VGP which frequently occurs because of the development of prime sawlogs and veneer quality logs. Once the prime and veneer quality standard has been achieved, VGP again begins to fall as the implicit costs of holding the asset offsets the value growth in these higher quality trees. When the alternative rate of return is 8%, financial maturity occurs at Point B. The tree's dbh (diameter at breast height) at this point is between 14 and 15 inches. Note that the point of financial maturity is not determined at A since the owner's alternative rate of return has just been reached, and higher VGP's are realized beyond this point.7 If the alternative rate of return were 6%, the point of financial maturity is at point C where the decreasing VGP equals the alternative rate of return, and tree diameter is between 20 and 21 inches (dbh).

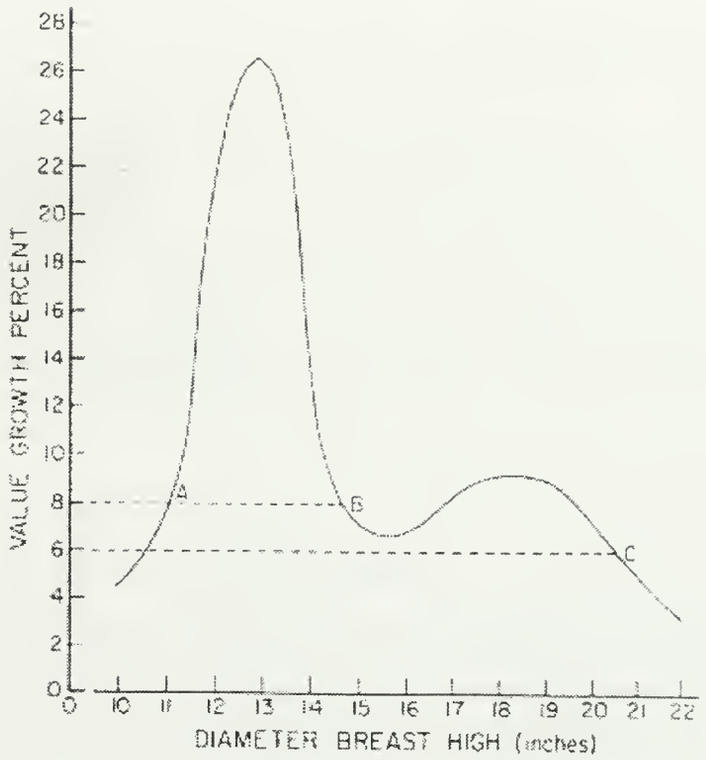

Figure 2. Value Growth Percent track for a hypothetical tree composited from 145 tuliptrees and red and white oak trees. Source: Data on file in Purdue University Department of Forestry and Natural Resources.

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istics which make it difficult to ascertain the age at which financial maturity is reached. In the case of timber, the basic reasons for this difficulty are the inherent nature of the wood production process (a tree is both the production facility and the product) and the changes in quality which occur as trees grow in size.

Since a tree's annual growth cannot be harvested without also destroying the production process itself, financial maturity for trees is approximated when the tree's rate of value increase (value growth percent) is just equal to the owner's implicit cost associated with the capital investment in the tree. This cost is determined by the rate of return which the owner expects from other investments of similar risk and duration. In other words, financial maturity is that point in the life of the tree beyond which the expected value increase no longer equals or exceeds the net return which would be obtained if the tree were sold and the cash value were invested elsewhere. The owner's "expected" rate of return is referred to as his "alternative rate of return" which is discussed in greater detail later. The net effect of cutting financially mature timber is to maximize the net return to the forest enterprise. 2 If the tree is not cut when the point of financial maturity is reached, the investment will not be earning a rate of return greater than or equal to the return expected from the alternative investment. Thus, the cutting of the tree and the reinvestment of the capital funds at the alternative rate of return will provide a greater return than maintaining the investment in the tree. Throughout this discussion, it is assumed that the investor wants to maximize his return on investment and that an alternative investment is always available for reinvestment, e.g., a savings account.

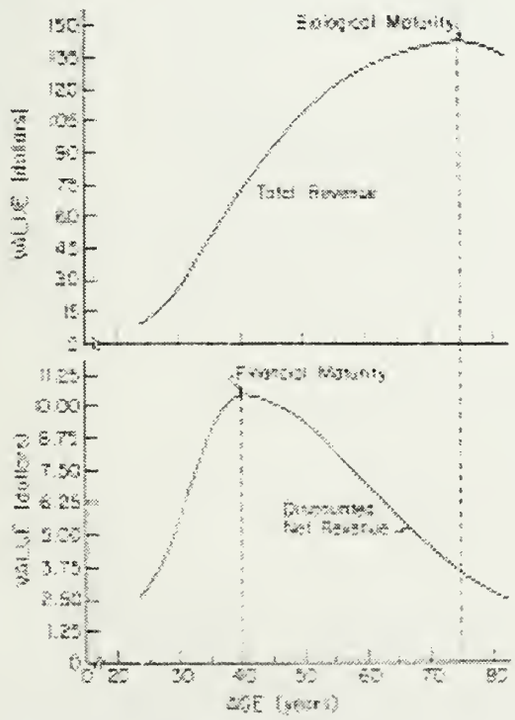

Figure 1. Comparison of financial and biological maturity for a hypothetical tree.

In contrast, the biological maturity of a tree or a stand of trees occurs when the tree or stand achieves maximum merchantable volume. Financial maturity differs from biological maturity by imposing economic and business management constraints on the production process. In determining financial maturity, benefits are weighed against costs. The benefits are the marketable values, while the costs include capital charges and expenses. If the financial maturity concept is adopted as a management guide, trees and stands are normally harvested at a point in time prior to their biological maturity (Figure 1). Usually the point of financial maturity and biological maturity will be equal only if costs are zero and the owner's alternative rate of return is zero. 3

Information Requirements

The Alternative Rate of Return

It is necessary that the "proper" alternative rate of return be determined. It is the rate earned by the investor's best alternative investment. One way for a woodland owner to estimate his alternative rate of return is to review present and future investment opportunities. For example, someone investing money in a Certificate of Deposit for 5 years at 10% is providing a guide to his alternative rate of return. If another available investment is the improvement of cropland through drainage, and the expected return is 15%, this would also provide an indication of alternative investment opportunities. Likewise, the cost to an individual in borrowing money provides a similar guide. A tree or stand earning less might be subject to liquidation with the money used to repay a loan or to be reinvested after fully considering the comparable risks, uncertainties, and length of investment period. The rate may vary from time to time in accordance with the owner's appraisal of his financial circumstances.

In summary, the "required" return (the alternative rate of return) is the rate of return a person will need to economically justify an investment in a given type of asset. If the yield from an asset fails to meet this expectation, the rational decision is to liquidate the existing capital asset and to reinvest the proceeds in another form of capital, earning a rate of return equivalent to or greater than the "required" rate.

Expected Incremental Changes in Tree Value

Trees increase in value in three principal ways. As trees grow, they increase in volume and, consequently, in the amount of wood which has merchantable value. They may also improve in quality as the knotty cores are buried under clear layers of annual growth. Changes in quality are reflected in the increased market price per unit volume of standing timber and cut products. The value of trees may also increase over time relative to other goods and services in the economy as a consequence of market scarcity or changing

Table 1. Present and future size and value of the sample white oak.

Time from present	dbh	Log length	Purdue log grade	Log volume Doyle rule	Value per board ft.	Value per or	Value per tree	Value growth percent
years	inches	feet	designation	board ft.	dollars	dollars	dollars	percent
(1)	(2)	(3)	(4)	(5)	(6)	(5x6-7)	Sum 7-8	(9)
0	14.2	16	2	48	.109	5.23		
		16	3	27	.088	2.38	7.61	2.52
5	14.6	16		54	.109	5.89		
		16	3	31	.088	2.73	8.62	2.41
10	15.1	16	2	60	.109	6.54		
		16	3	36	.088	3.17	9.71	8.32
15	16.0	8	1	46	.159	7.31		
		16	2	48	.109	5.23		
		8	3	22	.088	L 94	14.48	3.85
20	16.8	8	1	56	.159	8.90		
		16	2	57	.109	6.21		
		8	3	27	.088	2.38	17.49	
25	17.6	16		93	.159	14.79		
		8	2	32	.109	3.49		
		8	3	27	.088	2.38	20.66	2.06
30	18.0	16	1	100	.159	15.90		
		16		64	.109	6.98	22.88	

A Specific Case

*When should a white oak tree, presently 14.2" dbh, be harvested if the owner's alternative rate of return is 7%?

*Should the tree be cut now or allowed to grow?

*Is the tree paying its way compared to other investments available to the owner? To respond to these questions, the tree's prospects for growth and changes in quality must be appraised. Such an assessment for a hypothetical tree covering the next 30 years is shown in Table 1. To simplify the analysis, only the implicit cost of holding inventory is considered. Property taxes, management, and other explicit costs chargeable to an individual tree are minimal and can be safely ignored.

The calculated value growth percents (Table 1, Column 9) are the compound interest rates which equate the beginning tree values with the future tree values in the five-year time periods indicated. Since all other costs except holding costs have been assumed to be negligible, a relatively simple formula can be used to calculate the value growth percent: [8]

$$VGP = \frac{[FV]^{1/t} - 1}{[PV]}$$

where VGP = Value Growth Percent
PV = Beginning Tree Value
FV = Ending Tree Value
t = Number of Years Between Estimated Tree Values

As an example, to calculate the VGP between 10 and 15 years:

$$VGP = \frac{14.48^{1/5} - 1}{9.71}$$

$$VGP = 1.49124^{1/5} - 1$$

$$VGP = 1.0832 - 1$$

VGP = .0832 or 8.32% [9]

Since the owner's alternative rate of return is 7%, the point of financial maturity would occur later, and the decision to cut would be postponed until that time when the VGP declines to the owner's

alternative rate of return. If the owner's alternative rate of return is greater than 8.32%, test the next time interval to see if VGP is increasing or decreasing. If it is decreasing, then the tree should be harvested unless there are non-economic factors that need to be considered.

Application

The concepts and procedures outlined above can assist landowners in deciding whether or not to cut target trees. The example which was used analyzed prospective returns and implicit costs during five-year periods. The principles can also be applied on a year-to-year basis. In other words, it is not necessary to make growth and value projections over extended periods of time. However, the assistance of a forester in estimating values and prospective growth may be desirable whatever the owner's planning horizon. Guidance in obtaining the help of foresters is found in Purdue University Extension publication FNR-87 "Forestry and Wildlife Management Assistance Available to Indiana Woodland Owners: Providers and Programs." Guidelines based on the financial maturity concept published by Trimble, et a!. (1974) provide the basic elements for selecting trees that should be harvested (Table 2). These guidelines are influenced by both silvicultural and financial maturity concepts and provide a good balance between the two. Note that at lower alternative rates of return (2 to 5%), trees growing on good sites (10), e.g., Site 80, may have larger diameters (dbh) at financial maturity than those trees growing on poorer sites.

Financial Maturity of Even-Aged Stand The General Case

In even-aged stands managed for timber production, the length of rotation (number of years between planting and harvesting) may be determined by using the financial maturity concept. The basic value growth percent method used in the case of an individual tree will be employed again. Since stands are groups of individual trees, determining financial maturity for a stand involves the same factors used in the analysis of individual trees; however, these factors are aggregated into one average value for the stand. Figure 2 also characterizes stand growth and the phenomena which were described earlier for individual trees also occur in stands.

Table 2. Diameter limits for harvesting sawlog trees at different alternative rates of return.

	Mark trees of these dbh classes and larger;														
	Low						Medium						High		
Species	2%			3%			4%			5%			6%		
	80	70	60	80	70	60	80	70	60	80	70	60	80	70	60
Yellow poplar	26	26	24	24	22	22	20	18	18	20	18	18	18	18	18
Beech	24	22	22	22	20	20	20	18	18	20	18	18	18	18	18
Black cherry	32	30	30	28	26	24	22	20	18	20	20	18	18	18	18
Red maple	32	30	30	28	26	24	22	22	18	20	20	18	18	18	18
White ash	30	28	28	26	24	24	22	20	18	20	20	18	18	18	18
Sugar maple	32	32	30	28	28	24	22	22	18	20	20	18	18	18	18
Red oak	26	26	24	24	24	22	22	22	20	22	20	20	20	18	18
White oak	24	22	20	22	20	20	20	18	18	20	18	18	18	18	18
Chestnut oak	24	24	22	22	22	20	20	18	18	20	18	18	18	18	18
Other long-lived species	26	24	24	24	22	20	20	18	20	20	18	18	18	18	18

Trees to mark—sawlog.sizes
(above 11.0 inches dbh)

For All Rate-of-Return Classes, Mark:

1. Culls and near culls.
2. Trees with significant rot in the butt log.
3. Very low-vigor trees (vigor 4).
4. Extremely rough trees with butt-log grade 5.
   trees over 15 inches with butt-log grade 4.
5. Any

In addition, trees above a certain dbh class are marked under certain conditions. This dbh varies with the rate of return desired, by species, and, in the case of oak, by site quality. It also varies by crown or vigor class and is additionally affected by the likelihood of log-grade improvement. The trees to mark are those of the indicated dbh's and larger. These will be

alternative rate of return. If the owner's alternative rate of return is greater than 8.32%, test the next time interval to see if VGP is increasing or decreasing. If it is decreasing, then the tree should be harvested unless there are non-economic factors that need to be considered.

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The concepts and procedures outlined above can assist landowners in deciding whether or not to cut target trees. The example which was used analyzed prospective returns and implicit costs during five-year periods. The principles can also be applied on a year-to-year basis. In other words, it is not necessary to make growth and value projections over extended periods of time. However, the assistance of a forester in estimating values and prospective growth may be desirable whatever the owner's planning horizon. Guidance in obtaining the help of foresters is found in Purdue University Extension publication FNR-87 "Forestry and Wildlife Management Assistance Available to Indiana Woodland Owners: Providers and Programs." Guidelines based on the financial maturity concept published by Trimble, et a!. (1974) provide the basic elements for selecting trees that should be harvested (Table 2). These guidelines are influenced by both silvicultural and financial maturity concepts and provide a good balance between the two. Note that at lower alternative rates of return (2 to 5%), trees growing on good sites (10), e.g., Site 80, may have larger diameters (dbh) at financial maturity than those trees growing on poorer sites.

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	80	70	60	80	70	60	80	70	60	80	70	60	80	70	60
Yellow poplar	26	26	24	24	22	22	20	18	18	20	18	18	18	18	18
Beech	24	22	22	22	20	20	20	18	18	20	18	18	18	18	18
Black cherry	32	30	30	28	26	24	22	20	18	20	20	18	18	18	18
Red maple	32	30	30	28	26	24	22	22	18	20	20	18	18	18	18
White ash	30	28	28	26	24	24	22	20	18	20	20	18	18	18	18
Sugar maple	32	32	30	28	28	24	22	22	18	20	20	18	18	18	18
Red oak	26	26	24	24	24	22	22	22	20	22	20	20	20	18	18
White oak	24	22	20	22	20	20	20	18	18	20	18	18	18	18	18
Chestnut oak	24	24	22	22	22	20	20	18	18	20	18	18	18	18	18
Other long-lived species	26	24	24	24	22	20	20	18	20	20	18	18	18	18	
	Trees to mark—sawlog.sizes (above 11.0 inches dbh)														

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5. Any

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6. Any short-lived species, such as black locust, sassafras, and butternut, unless they are unusually vigorous.

marked unless a potential grade improvement can be foreseen in the next 10 years.

Source: Trimble et al. (1974), p. 12.

A Specific Case

* When should a 40 year-old, even-aged stand of upland oaks be harvested if the owner's alternative rate of return is 6%?

* Should the stand be cut or allowed to grow?

* Is the stand paying its way compared to other investments available to the owner?

To respond to these questions, the stand's prospects for growth and impending changes in quality must be appraised. The stand's future expenses must be estimated, also. Estimates of these items covering the next 25 years are shown in Table 3. The VGP is calculated similarly to the VGP for individual trees, except that intermediate revenues and periodic explicit costs will enter into the calculation. The value growth percents, including the intermediate values, are calculated by the formula. [11]

For example, to calculate the VGP for the period 5 to 10 years in the future using data from Table 3 and a 6% alternative rate of return: Substituting these values into the formula, the formula reads: Completing the operations: In the example given, the point of financial maturity comes in the 20 to 25 year period because the VGP equals and then falls below 6% in this period. In other words, to maintain a rate of return of 6% on assets, it is necessary to harvest the stand in this period and re-invest in an alternative investment, such as savings accounts, or re-establish a new stand of trees.

Application

To estimate financial maturity for a stand, estimate present and future stand values in 5 or 10 years. Next estimate any intermediate periodic costs or revenues which will be associated with the woodlands during this period. Annual constant or almost constant cost may be ignored. [12] An example of periodic revenues may be from

Table 3. Values costs and revenues for a forty-year-old even-aged stand of upland oaks.

Time from present	Volume per acre	Value per bd. ft.	Gross total value	Intermediate Costs	Intermediate Revenues	Discounted Costs (Cnx DFm)	Discounted Revenues (Rm x DFm)	Future value	Present value	Value growth percent
years	bd. ft.				dollars					percent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0	611	.0965	58.96						58.96	
4				10		7.92				6.72
5	717	.1096	78.58					78.58	78.58	
7				10		8.90				24.52
8					15		12.59			
10	2061	.1177	242.58					242.58	242.58	
12					30		26.70			8.73
15	3041	.1258	382.56					382.56	382.56	
20	4087	.1353	552.97					552.97	552.97	7.65
										5 31
25	5115	.1400	716.10					716.10		

the selling of firewood or from a commercial thinning. Select your alternative rate of return. Now enter the estimated values and intermediate costs and revenues into the formula for VGP for even-aged stands, and calculate the VGP. If it is greater than the alternative rate of return, maintain the stand for the number of years in the period examined. If the VGP is less than the alternative rate of return and the trees to be harvested are of sawlog size, harvest the stand. Calculations of VGP for young, non-merchantable stands will not yield acceptable rates of return just as new businesses or manufacturing processes take time to begin operating on a profitable basis. Therefore, harvesting a stand before merchantability is reached may reduce the total wealth of the owner.

Income Tax Implication

Up to now the effect of income taxes has been ignored so as to not complicate the basic idea of financial maturity. In general, the inclusion of income tax expenses in the calculation of value growth percent for individual trees as described herein will not materially change financial maturity. It is, therefore, recommended that income taxes be ignored along with other explicit costs in these cases. However, the same is not always true when considering the financial maturity of tree stands. Because some expenses may be reduced by itemized deductions, the effect of income taxes is to shorten the time a stand will be held when all other things are held constant.

As the number of periodic deductible expense increases and as your personal income tax rises, the influence of income taxes becomes more significant. For example, if you are in a low-income bracket or have few expenses, the calculation of after-tax financial maturity is not recommended If your tax rate is high and many expenses are incurred in the woodlands, after-tax analysis may be worthwhile.

Summary

Procedures and guidelines are presented which will assist woodland owners in determining whether or not to harvest individual trees or stands if income maximization is an objective. These procedures and guidelines are based on the individual owner's investment alternatives. The suggested methods help insure that the woodland owner will receive his expected and desired rate of return on the investments. if not, the owner should cut the timber and either reestablish new woods or convert the land to another more profitable investment.

The VGP method recommended will provide reliable estimates of financial maturity if accurate estimates of present and future tree value are made. These estimates of tree value will be influenced by site, species, and the tree's unique growth rate. The guidelines in Table 2 must be used with the knowledge that the individual tree's unique growth rate has been considered only by averaging the growth of many trees. Therefore, some trees may have diameters at financial maturity which are lower or higher than the diameters suggested.

Finally, if tree prices are expected to rise or fall relative to all other commodities, the point of financial maturity will lengthen or shorten, respectively. This may be incorporated in the VGP method by increasing or decreasing the relative prices used to evaluate the volume of timber and proceeding to calculate VGP as described.

Sources of Additional Information Estimating Tree Volume and Log Quality

FNR 4, How to Make and Use the Tree Measuring Stick, W. L. Fix. Purdue University Cooperative Extension Service Publication.

Financial Maturity Concepts

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APPENDIX

TABLE 1. PRESENT VALUE OF $1.O0 RECIEVED IN YEAR N (DISCOUNTING)

INTEREST RATES

N	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513
4	.9610	.9238	.9~85	.8548	.8227	.7921	.7629	.7350	.7084	.6830
5	.9515	.905?	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209
6	.9420	.8880	.3375	.7903	.7462	.705O	.6663	.6302	.5963	.5645
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5439	.5019	.4665
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4804	.4241
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176
17	.8444	.7142	.6050	.5134	.4363	.7714	.3166	.2703	.2311	.1978
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635
20	.8195	.6730	.5637	.4564	.3769	.3118	.2584	.2145	.1784	.1486
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573
35	.7059	.5000	.3354	.2534	.1613	.1301	.0937	.0676	.0490	.0356
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221
45	.6391	.4102	.2644	.1712	.1113	.0727	.0476	.0313	.0207	.0137
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085
55	.5785	.3365	.1968	.1157	.0683	.0406	.0242	.0145	.0087	.0053
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033

RR 9/93

Footnotes

1 See Chapman, H. H. & W. H. Meyers, 1947. Forest Volootion. New York. McGraw-Hill Book Company, Inc. or Johnston, R. W., 1970. Capitol Budgeting Belmont, California. Wadsworth Publishing Company, Inc. for a discussion of net present worth and internal rate of return.

2 Proof of this statement and derivation of formulas used in this publi- cation can be obtained by writing Dr. J. C. Callahan, Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN 47907.

3. Robert W. Koenig, Indiana Department of Natural Resources, Division of Forestry, suggested the following "unusual" case for a single black walnut tree. In 1959, the Hougham family had a standing offer of $2,500 for a very old and large black walnut tree. The family held the tree until 1965, at which time it sold for $12,600. The tree was 35.5 inches, contalned an estimated 2,259 bd. ft. of merchantable volume, and was about 150 years old. The tree had reached biological maturity since a small hole was discovered in the butt log, causing some loss of merchantable volume. If the concept of financial maturity had called for cutting the tree in 1965, the tree might have been both financially and biologically mature with an alternative rate of return greater than zero. The situation surrounding the marketing of this tree was unique The tree sold at $5.33 per bd. ft., while the average price of the best and largest black walnuts

sold in Indiana during 1965 was only $.85 per bd. ft.
4 Refer to Footnote 2.
5 For the mathematically inclined, the graph in Figure 2 represents a bimodal discounted net revenue distribution. The assumption made is that the first mode or maximum is the global maximum.
6 Value growth percent is explained in detail in the next section.
7 The value growth percent is analogous to calculating the marginal revenues for any productive process. Equating VGP and the alternative rate of return is analogous to equating marginal cost to marginal revenue.
8 Refer to Footnote 2.
9 Many pocket calculators are now "programmed" to provide nth root calculations Logarithmic tables can also be used to obtain nth roots.
10 Site is a measure of productivity which includes climatic, soil, and topographic factors. It is commonly measured as the height of the dominant and co-dominant trees on a site at age 50 or 100 years.
11 Refer to Footnote 2.
12 Refer to Footnote 3.

Cooperative Extension Work in Agriculture and Home Economics, State of Indiana, Purdue University and U.S. Department of Agriculture Cooperating. H.A. Wadsworth, Director, West Lafayette, IN. Issued in furtherance of the Acts of May 8 and June 30, 1914. It is the policy of the Cooperative Extension Service of Purdue University that all persons shall have equal opportunity and access to our programs and facilities.

Reprinted from Woodland Management Publication FNR-91, Purdue University Cooperative Extension Service.

ESTABLISHING YOUR BASIS AFTER THE FACT

by Bill Hoover

Not knowing your timber's basis puts you at a financial disadvantage. Even if financial gain isn't your primary reason for being a forest landowner or Tree Farmer, you should know your basis. If you haven't determined the basis of your timber yet, please read on. Don't let the apparent lack of precision inherent inthe process make you uneasy. The sooner it's done, the easier it is to do.

Basis is the book value of your timber. It's used to determine gain or loss on timber sales, condemnations, and the amount of casualty losses. Without a basis, you'll pay tax on all your timber income and won't have a causalty-loss deduction. Please don't mix the issues of capital gains and basis, however. Knowing you timber's basis is not a requirement for capital gains treatment.

If you purchased you Tree Farm (or forestland), its total bais is the purchase price plus other costs incurred to take legal title of the property. If inherited, it's the fair-market value on the date the person leaving it to you died. If a gift, the basis of the person giving it to you "carries over" to you. But knowing the basis for the Tree Farm (or forestland) as a whole is just a start. You need to allocate the total among the individual assets acquired with the property. At a minimum, these are the timber and the timberland.

Even if you make the allocation years after acquiring your Tree Farm (or forestland), you must use conditions on the date of acquisition. That's why it is better sooner than later. If later, you and your forester have to estimate the quantity, quality, and fair-market value of the timber on the date of acquisition. It's also necessary to estimate the fair-market value of the timberland and any other assets acquired at the same time.

In some cases it may not be cost effective to gather the necessary information. You're spending today's dollars to pick up old (deflated) basis dollars. My rule of thumb is to almost always go through the process if you acquired your Tree Farm (or forestland) withing the last 10 years. If it's been more than 20 years, the cost may exceed the benefit. You'll need to estimate what the potential benefit is to you.

Regardless of when it's done, the process is the same. Estimate the fair-market value (FMV) of your land, the merchantable timber, and other assests you acquired. Get the total FMV by summing the individual FMV's for all the assets. Most likely the total FMV won't be what you paid for the property or its fair-market value in the estate. This doesn't matter because the process used adjusts for this. Divide the FMV of each asset by the total FMV of the individual assets. The percentage for each asset is multiplied by the acquisition cost to get the basis fo that asset. The result is that the sum of the bases for each of the assets equals the acquisition cost or FMV of the estate. This method for basis allocation is discussed in detail in IRS publications and all the timber-tax manuals.

Your state forester, extension forester, or consulting forester can help find historical land and timbe values. ***IFMN Editor's Note: Illinois timber prices from 1978 to present can be found at the***

following web site address:

http://ilvirtualforest.nres.uiuc.edu/page25.html

The IRS requires that to the extent possible published averages should be adjusted to reflect specific conditions on your Tree Farm (or forestland). The trick is to reconstruct the condition of your timber as of the date of acquisition. If the species and quality of your timber hasn't changed significantly, this can be done b growing the current volume of timber in reverse. You also need to reduce the current volume by previous timber you may have harvested. You may need the help of a forester to estimate the information needed.

A reasonable effort should be made to get the best available information. What's reasonable depends on how far back you're going, the value of your timber, the tax implications, and the cost compared to the dollars of basis you'll pick up. The use of professional forester and qualified real estate appraiser may be reasonable for large properties with significant timber values. A do-it-yourself approach may be reasonable for very small Tree Farms. No matter how you do it, keep in your records information about how you got the values used and how the allocation was made.

If all you own is the land and timber, it may seem reasonable to use the so-called "residual method" of basis allocation. This means estimating the FMV of the land itself, subtracting this amount from the total basis, and applying the balance or residual amount to the timber. This approach has been upheld in court. But it only works if it gives a reasonable result. Reasonable means a result similar to what would be obtained by the percentage method described above. But the percentage method described above is most likely to provide reasonable results.

If you have already had a timber sale and didn't reduce the proceeds by the basis of the timber sold, you may need to reduce your basis by this amount even though you got no tax benefit from it. Some tax practitioners take the position that this isn't necessary. Follow the advice of your tax preparer.

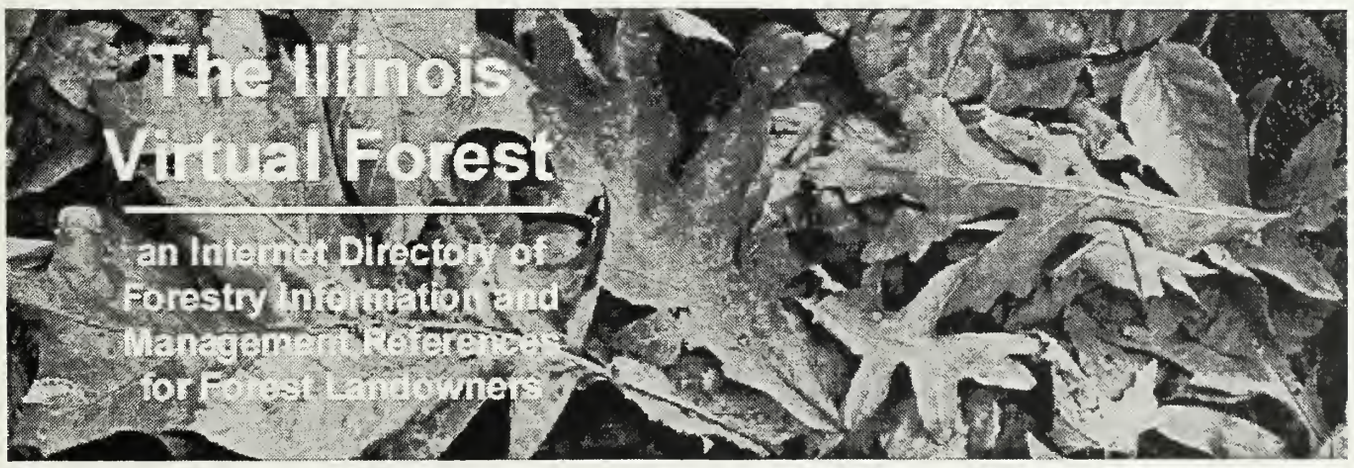
Reprinted from *Tree Farmer* magazine, Nov/Dec, 1995; page 18.

Announcing a new information web site for forest landowners!

The **Illinois Virtual Forest** web site is a comprehensive listing of forest management and tree care information for Illinois forest landowners. The web site is sponsored by the Illinois Forestry Development Council and is maintained by the University of Illinois Department of Natural Resources and Environmental Sciences.

The web site can be accessed from this web address:

http://ilvirtualforest.nres.uiuc.edu



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ILLINOIS TIMBER PRICES

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ILLINOIS DEPARTMENT OF NATURAL RESOURCES

June 5, 2000

PRICES PAID ILLINOIS TIMBER PRODUCERS NOVEMBER 1999 THROUGH FEBRUARY 2000

Summer sawtimber prices paid to Illinois timber growers generally showed mixed trends for F.O.B. Mill and stumpage compared to both the previous summer and winter. Of the timber buyers reporting volume of their 1999-2000 operations, 40% indicated their volume was 500 thousand board feet or more.

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones, based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS
SAWTIMBER - $ PER M BD. FT.

SPECIES	November 1998 - February 1999		May 1999 - August 1999		November 1999 - February 2000	
	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
Ash	160	300	160	270	150	270
Basswood	100	250	110	200	120	260
Beech	80	200	75	170	80	180
Cottonwood	55	160	65	150	70	160
Sweet Gum	80	180	75	180	80	170
Elm & Hackberry	75	180	75	180	70	180
Hickory	100	240	110	200	100	210
Soft Maple	100	240	110	200	100	210
Sugar Maple	160	320	170	280	170	350
Black Oak	170	300	160	260	150	290
Pin Oak	85	200	95	180	80	180
Red Oak	220	300	230	360	220	350
White Oak	220	360	230	350	210	350
Yellow Poplar	140	280	120	290	130	280
Sycamore	70	170	80	180	70	180
Black Walnut	350	510	330	500	300	500
Woods Run Bottomland	100	210	90	190	95	200
Woods Run Upland	150	250	150	260	170	250
FACE VENEER - $ PER M BD. FT.						
Red Oak	480	920	610	910	530	900
White Oak	970	1,660	1,010	1,670	1,050	1,630
Walnut	1,390	1,940	1,720	3,120	1,540	2,460
COOPERAGE - $ PER M BD. FT.						
White Oak	280	450	290	550	300	570
UNPEELED PULPWOOD - $ PER TON						
Ton	3.00	19.50	3.00	21.00	3.30	21.80

Timber Prices
May 1999 - February 2000
June 5, 2000

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
November 1999 - February 2000

PRODUCT	UNIT	Zone 1		Zone 2		Zone 3	
		Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
1. Sawtimber				Dollars			
Ash	M bd. ft.	70-250	150-400	85-300	170-350	70-180	180-350
Basswood	M bd. ft.	100	N/A	75-225	160-300	70-200	180-450
Beech	M bd. ft.	50-100	150-200	85-120	160-200	50	N/A
Cottonwood	M bd. ft.	50-100	100-200	40-120	120-225	40-80	100-180
Sweet Gum	M bd. ft.	50-100	100-230	50-120	130-200	N/A	N/A
Elm & Hackberry	M bd. ft.	50-100	150-230	50-120	130-200	45-80	150-200
Hickory	M bd. ft.	50-150	150-220	50-225	150-300	60-150	180-325
Soft Maple	M bd. ft.	50-120	150-210	50-180	170-300	70-175	150-300
Sugar Maple	M bd. ft.	100-250	180-350	80-300	200-600	70-300	200-650
Black Oak	M bd. ft.	80-250	180-500	65-400	160-600	50-280	160-400
Pin Oak	M bd. ft.	50-110	180-200	50-160	130-200	50-150	140-250
Red Oak	M bd. ft.	110-350	190-500	80-350	170-500	70-350	160-540
White Oak	M bd. ft.	110-400	190-600	80-450	170-600	70-350	160-500
Yellow Poplar	M bd. ft.	100-200	190-350	50-220	200-350	75-150	N/A
Sycamore	M bd. ft.	50-110	100-210	45-120	150-250	50-80	150-200
Black Walnut	M bd. ft.	200-500	250-650	100-500	250-770	140-500	250-700
Woods Run Bottomland	M bd. ft.	50-120	150-250	50-160	160-250	50-150	250
Woods Run Upland	M bd. ft.	80-300	150-400	70-320	160-380	70-300	200-450

		STATEWIDE	
		Stumpage	F.O.B. Mill
2. Face Veneer			
Red Oak	M bd. ft.	200-1,000	500-1,500
White Oak	M bd. ft.	400-1,750	700-2,300
Walnut	M bd. ft.	500-2,500	1,500-4,000
3. Cooperage			
White Oak	M bd. ft.	170-400	400-800
4. Pulpwood			
Unpeeled	M bd. ft.	2.50-4.00	19.00-23.00

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	95
Scribner	4
International	1

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rated Reported $/M bd. ft.
Zone 1	15	110-200
Zone 2	22	150-250
Zone 3	19	150-300
Illinois	19	110-300

VOLUME OF 1999-2000 OPERATIONS

Size in (000) bd. ft.	Zone 1	Zone 2	Zone 3	All
	%	%	%	%
1 - 100	19	45	32	33
100 - 500	19	17	43	27
500 - 1,000	29	10	7	14
1,000 - 3,000	28	14	7	16
3,000 +	5	14	11	10

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer" used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

MARKED TIMBER SALES - NOVEMBER 1999 - FEBRUARY 2000
STATEWIDE STUMPAGE

Woods Run Upland	$179-$441/M bd. ft.
Woods Run Bottomland	$147-$230/M bd. ft.

*Prices supplied to District Foresters by seller, may include some veneer.

Garry D. Kepley, State Statistician
Tom Pordugal, Rick Kestle, Agricultural Statisticians

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UNIVERSITY OF ILLINOIS EXTENSION

ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

Volume 2, 2000 No. 39

IN THIS ISSUE

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and University of Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801.

We continue to receive inquiries from landowners who want to know how to measure trees for their board-foot volume and where they can obtain a tree scale stick to take the measurements. To help answer these questions, we have developed detailed instructions with photographs which help explain the measurement procedure. We also have included a tree scale stick in this newsletter. Instructions are included which detail how the stick is to be constructed using a standard yardstick. The tree scale stick included in this newsletter is based on the Doyle Rule, which is the standard used to measure timber on private land in Illinois. The scale stick is designed for a 25-inch reach.

How To Measure Standing Timber For Board-Foot Content

Standing trees sold for veneer or sawlogs are valued in terms of their board-foot volume; a board foot being a board 1 inch thick by 12 inches wide by 1 foot long. One of the basic tools for measuring the board-foot volume of standing trees is a calibrated tree scale stick. Other names used for this instrument are Cruiser's or Biltmore stick. With the scale stick, the tree's diameter is measured at a point 4 1/2 feet above the ground line and the tree's merchantable height is determined in 16-foot and additional 8-foot log lengths. Knowing these two measurements, the board-foot volume of the tree can be determined using various tree volume tables. Board-foot volumes in these tables will differ because of differences in the way the specific Rules were formulated. Common scales are the International 1/4-inch Rule, the Doyle Rule, and the Scribner Rule. The Doyle Rule is used to estimate tree volume in Illinois.

Understanding Board-Foot Volume

A tree (or the logs cut from it) is basically a large cylinder. When the tree is cut up into logs, the butt end of a log is larger than the

top end. The difference between the top and butt diameter measurements depends on the amount of taper within the log. When an attempt is made to determine the board-foot volume in a tree, ultimately we are attempting to determine how the sawyer at the mill will cut up the logs into boards to maximize its wood yield **(see Illustration 1)**. Using the various Rules mentioned above is a way of standardizing how many board-feet can be cut from a tree with a given diameter and merchantable height.

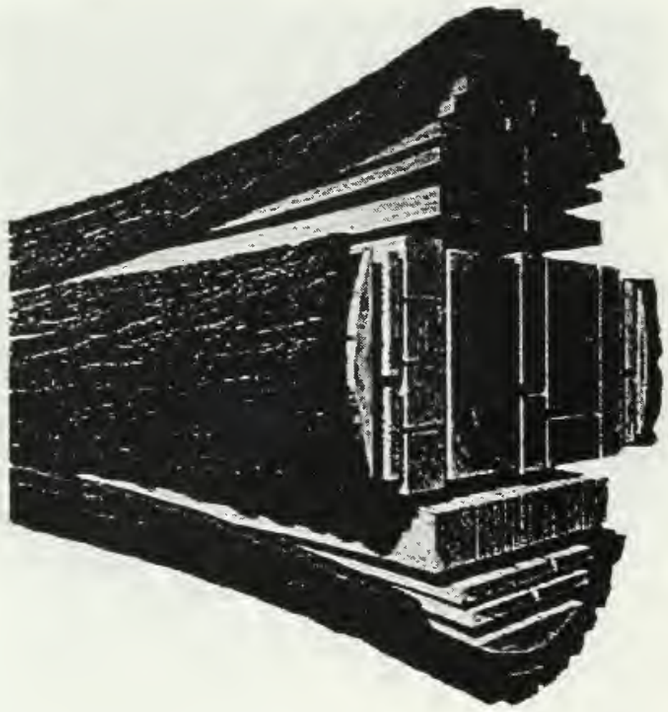


Illustration 1. Determining the Board-Foot Volume Equates to How Many Rectangular Boards Can be Cut From the Tree.

Cutting rectangular pieces of wood (boards) from a cylinder (a log) means that there will be some wood that is unusable for lumber. Every time the saw blade passes through the log, solid wood is turned into sawdust. Similarly, there are slabs and edges that will not be used to make boards either **(see Illustration 2)**. This wood is not wasted, however. Sawdust and slabs and edgings are further processed and are often used to make panel-type products such as particleboard. 'Waste' wood can also be burned at the processing plant to generate steam which is, in turn, used to run turbines and generate power for the processing plant. With technology continually increasing, little wood is ever wasted.

How to Determine theDiameter Measurement

Tree diameter is the most important measurement of standing trees. The point of measurement is 4 1/2 feet above the ground line , a

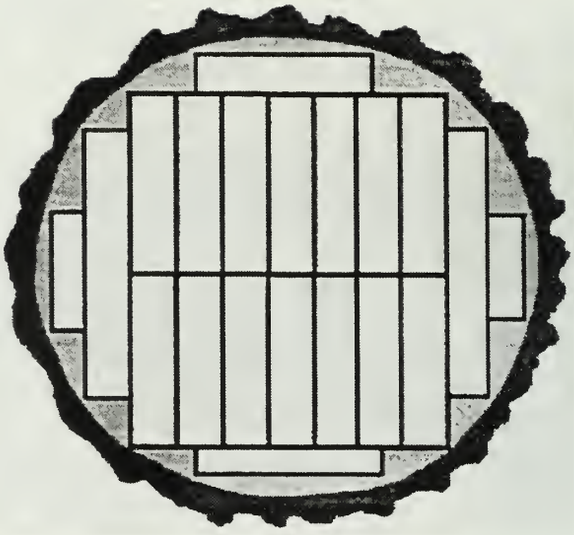


Illustration 2. When a log is cut up into boards, wood is lost to sawdust created by the saw blade (saw kerf – black lines) and to slabs and edgings (gray areas).

point referred to as "diameter breast height" or "DBH." Diameters are usually measured to the nearest inch, but where large numbers of trees are to be scaled, 2-inch diameter classes are used.

The tree scale stick used to measure the tree's diameter and its height and the stick needs to be calibrated for the length of your reach. Determining your "full arm" reach is simple. All you will

Photo 1. Determining Your 'Reach' is Easy Using a Yardstick. Place the Zero-end of the Yardstick at Your Eye and Fully Extend Your Arm. Read the Measurement at the End of Your Thumb.

Photo 2 and 2a. To Measure the Tree's Diameter, Position Yourself in the Center of the Trunk. Hold the Scale Stick Against the Tree at 4 1/2 Feet Above the Ground Line and Push Yourself Back 25 Inches Away From the Tree.

need is a standard yardstick. Have a partner stand to either side of your body. Put the zero-end of the yardstick up to your eye and fully extend your arm along the yardstick. The distance between your eye and the end of your thumb is your "full arm" reach **(see Photo 1)**. Have your partner read this distance off on the yardstick. When measuring a tree's diameter or its height, the scale stick is held 25 inches from your eye. Put the yardstick back up to your eye and extend your arm until your thumb grasps the 25-inch mark on the yardstick. Become familiar with the "feel" of a 25-inch reach. Another way to maintain a consistent 25-inch reach is to drill a hole in the middle of the scale stick and attatch a string through the hole. Tie a knot in the sting that is 25 inches away from the scale stick. When measuring trees with the stick, hold the knot on the string in your teeth and extend the scale stick away from you until the string is tight. This simple method will provide a consistent 25-inch reach.

At the end of this newsletter, you will find a tree scale stick with mounting instructions. It is designed to be mounted on a standard yardstick. The stick has a board-foot volume table printed on it.

To measure the tree's diameter, face the tree trunk and position yourself so your body is in the center of the trunk. Hold the tree scale stick horizontally against the tree at 4 1/2 feet above the ground line and push yourself back 25 inches away from the tree **(see Photo 2 and 2a)**. It is important that the distance between your eye and the scale stick be 25 inches. If this distance is less or greater than 25 inches, the diameter measurement you determine will be wrong.

Make sure you hold the scale stick firmly against the bark of the tree. Now shift the stick right or left until the zero end of the stick is flush with the left edge of the tree trunk. Without moving your head (move only your eyes, not your head), look over to the right edge of the tree's trunk and read the diameter measurement on the scale stick where the right edge of the tree trunk intercepts the stick **(see Photo 3 next page)**. Diameter of standing trees is measured outside the bark.

Because a tree's trunk is not round and is often more egg-shaped, it is necessary to take two diameter measurements to get an average diameter reading. Take the second diameter measurement 90 degrees to the first measurement **(see Photo 4 on Page 5)**. Add the two diameter measurements together and divide by 2 to determine the tree's average diameter. It is important to remember that on sloping ground always measure diameter on the uphill side of the tree.

Photo 3. At the 4 1/2 Foot Height, Move the Tree Scale Stick Right or Left to Line the Zero-end of the Scale Stick up with the Left Side of the Tree Trunk. Without Moving Your Head (Move Just Your Eyes), Look Over to the Right Side of the Trunk and Notice the Diameter Reading Where the Right Side of the Tree Intercepts the Scale Stick (Yellow Arrow). If You are Holding the Scale Stick the Correct Distance from Your Eye, This Reading is the Tree's Diameter. Diameter Should Always be Measured on the Uphill Side if the Tree is Growing on Sloping Ground.

How to Determine Merchantable Height

Merchantable height refers to the length of the usable tree and is measured from a 1-foot stump height to a cut-off (merchantable height) point in the top of the tree. The cut-off height will vary with locality, with the product being produced, and with excessive limbs, a major fork or other types of internal/external defects. Unless there are obvious, outward signs of defect in the trunk (logs), hardwood (deciduous or broadleaf) trees are normally measured to the first major fork in the trunk unless the upper (smaller) trunk diameter limit (determined by the processing mill) is reached before the fork in the trunk. Larger limbs do not necessarily cause a problem if they do not create a "Y" fork in the trunk. Side limbs will be cut off flush with the trunk when the tree is felled. Limbs do, however, create knots, which are considered defects, so the quality of the wood will not be as good when the tree has many branches along the trunk.

Other types of defects in the trunk that affect a tree's merchantable height include crook or sweep (bend) in the trunk or outward signs of rot and decay such as a conk (fungus fruiting body), swelling or bulge on the side of the trunk, or a hole indicating a cavity in the tree **(see Photo 5, 5a, 5b, 5c, 5d, 5e, 5f on Page 6)**. The cutoff (merchantable height) point will be at point below any of these defects for trees exhibiting such defects.

Conifers (evergreen, cone-bearing trees) normally grow with one central stem and rarely fork unless there is a double top. Unless there are internal or external defects, merchantable height in conifers is frequently determined by the smaller diameter limit in the top

log. This smaller diameter limit is established by the processing mill.

For logs that will be cut into lumber, the diameter limit for the top log cannot be less than 8 inches in diameter. If the tree you are measuring has no major defects and no forks, you should measure merchantable height to a point in the top of the tree where the trunk diameter equals 8 inches. If you are measuring timber for its pulp-

Photo 4. Tree's are Rarely Round, so You Need to Take Two Diameter Measurements at 90 Degrees to Each Other. Add the Two Measurements Together and Divide This Total by 2. The Result will be the Average Diameter of the Tree.

wood content, measure the merchantable height to a point in the top of the tree where the trunk diameter equals 4 inches.

To measure merchantable height, the tree scale stick's calibration requires that you stand 66 feet away from the tree being measured and you must hold the stick 25 inches from your eye in an upright, vertical position. The number of merchantable logs can be read from the stick's right-hand margin **(see Photo 6 on Page 8)**. It is important to make sure the stick is held vertical and not at an angle **(see Photo 7 on Page 8)**. Holding the stick so it tilts toward or away from you will yield a wrong measurement. Do not to move the stick or your head when taking a height measurement. Tilt your head back slightly so you do not have to move it when taking the height measurement. If you wear a hat, tilt it back on your head so it does not impair your vision. Moving your head changes angles and will result in a wrong measurement.

Before you pace away from the tree to take the height measurement, walk around the tree and look up into the canopy to inspect its entire trunk for signs of defect. Determine where the cut-off (merchantable height) point is before moving away from the tree.

Pace out or measure a distance 66 feet away from the tree. Make sure you walk away from the tree on the level or contour. When you turn and face the tree, the base of the tree should be at the same height as your feet. Do not walk uphill or downhill from the

Crook or Sweep in the Tree Trunk.

A Bulge, Swelling, or Canker on the Trunk.

Burls on the Trunk.

Large Dead Limbs Along the Trunk.

Cavity Holes Indicating the Trunk is Rotten and Hollow.

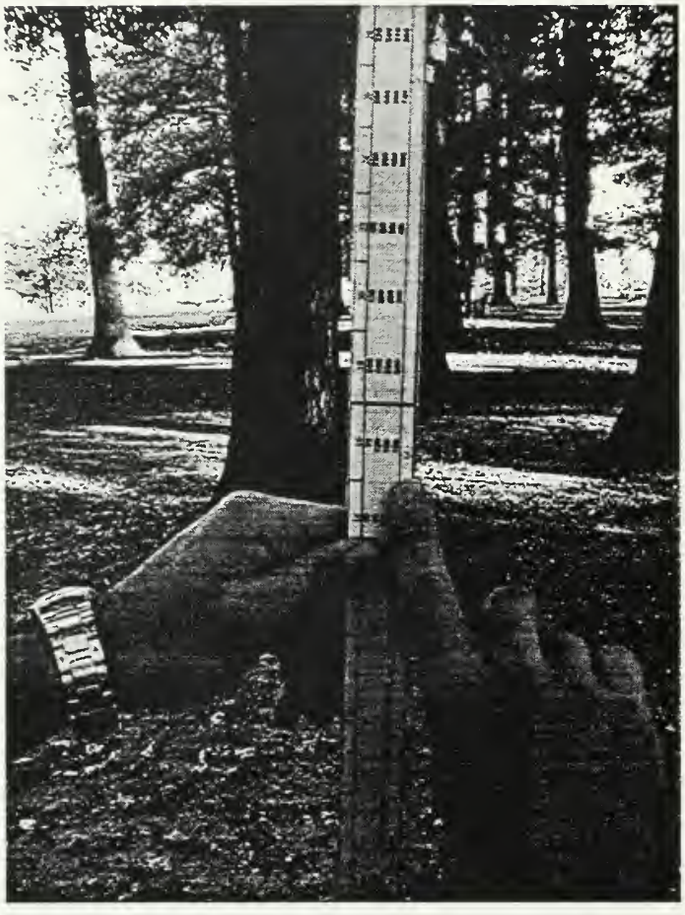
Seams or Shakes Causes by Wind, Lightning, or Frost (Crack) Damage.

tree to take its height measurement. Doing so will yield a wrong measurement.

When you reach the 66 foot distance, turn and face the tree. Hold the scale stick vertical and 25 inches from your eye. Line the zero end of the scale stick up with the a point on the tree's trunk that is 1-foot above the ground **(see photo 8 on Page 9)**. Loggers frequently do not cut trees off flush with the ground, so allowing for a 1-foot high stump is important when measuring the tree for merchantable height. If you place a clipboard with a white piece of paper at the base of the tree before you pace away from it, the top of the clipboard will equal a 1-foot high stump and will be easy for you to see at the 66 foot distance. Now without moving your head, look up (move only your eyes) into the tree and determine where the cut-off (merchantable height) point intercepts the scale stick. Read this measurement to the nearest full half-log **(see photo 9 on Page 9)**.

To determine the tree's board-foot volume, use the volume table printed on the scale stick. Knowing the diameter of the tree and its merchantable height in 16-foot logs, you should be able to determine the board-foot volume of the tree from the volume table on the scale stick.

The board-foot volume you have determined is called the gross board-foot volume. No deduction has been made for defect in tree.



Photos 6 and 7. When the Scale Stick is Held Vertical, the Single Numbers on the Right- hand Side of the Scale Stick Represent Full 16- Foot Logs. The Lines Between Each Full Log Represents a Half or 8-Foot Log. To Measure Merchantable Height, the Scale Stick is Held Vertical at the Correct Distance From Your Eye. Make Sure the Scale Stick Does Not Slant Toward or Away From You. A Slanted Stick will Result in an Incorrect Measurement.

If a deduction for defect is made, the resulting board-foot volume is the net volume. As a rule of thumb, in average to good quality timber, you can deduct about 10 percent of the gross board -foot volume for defect.

To make consistent and accurate diameter and height measurements, it is essential that you do the following things:

- ☐ Always hold the scale stick 25 inches from your eye.
- ☐ Take two diameter measurements at 4 1/2 feet above the ground and average the two measurements.
- ☐ Always measure diameter on the up-hill side of the tree growing on sloping ground.
- ☐ Position yourself 66 feet away from the tree on the same contour as the base of the tree to determine merchantable height.

For more information, please contact the Extension Forester at the University of Illinois; 217-333-2778.

Illinois Forest Management Newsletter Subscriptions to Terminate in June, 2001.

The University of Illinois Extension Newsletter Service will no longer offer subscriptions to Illinois Forest Management Newsletter. Current subscriptions will be honored through the July 2001 issue. After June, printed copies of Illinois Forest Management Newsletter will no longer be available, but the newsletter will continue to be produced. Both future and past issues can be accessed and downloaded from this Internet address:

http://www.nres.uiuc.edu/outreach/pubs/ifmn.html

If you have a question about your subscription to the newsletter, please direct your inquiry to U of I Extension Newsletter Service; 1-800-345-6087.

Photos 8 and 9. Merchantable Height is Measured From a 1-Foot Stump Height. A Clipboard With White Paper is a Useful Tool When Measuring Trees in the Woods. Place the Clipboard at the Base of the Tree and Pace Away From the Tree 66 feet to Take the Height Measurement With the Scale Stick. Line the Zero-end of the Scale Stick Up With the Top of the Clipboard. Without Moving Your Head, Look Up Into the Tree and Determine Where the Merchantable Height (Cutoff) Point Intercepts the Scale Stick. In the Above Example, This Tree's Merchantable Height is 1 1/2 Logs. Merchantable Height is Just Below the First Major Fork in the Trunk. Merchantable Height is Measured to the Nearest Full Half-Log.

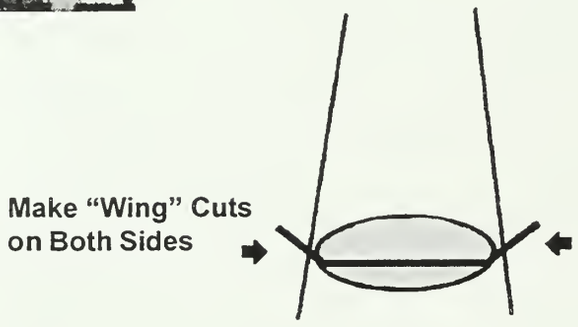
For information on harvesting and selling timber, check out "Logging" at this comprehensive web site:

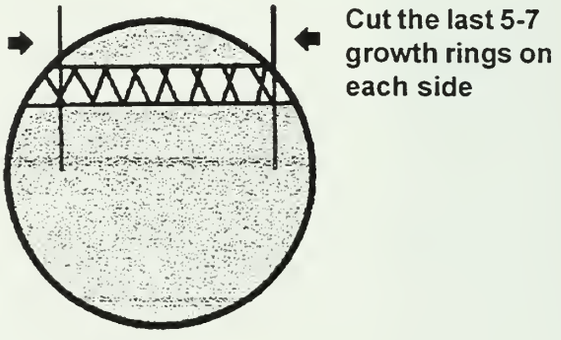
http://ilvirtualforest.nres.uiuc.ed

The following article is a continuation in the series of **Tim's Tips** articles reprinted from the logger training manual developed by Mike Bolin, Extension Forester and Tim Ard, president of Forest Applications Training, Inc. for the ***Illinois Pro Logger Training Program.*** The chain saw safety and timber felling information is useful for landowners who own and use a chain saw on their property.

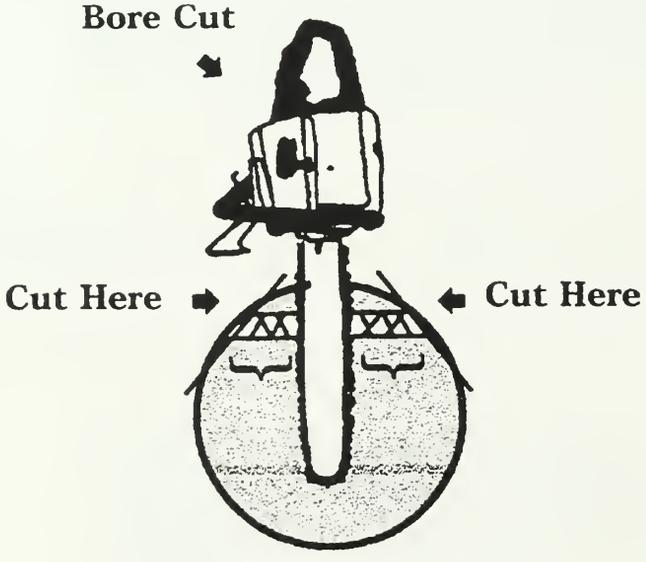
How To Eliminate Fiber Pull and Splitting During Tree Felling

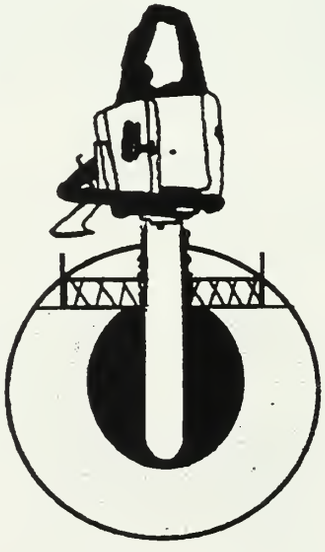
Some trees pull fiber from the sides while they're falling. An easy way to reduce this damage is to make side cuts on either side of the notch immediately after completing the open face notch. A properly formed hinge will be strong enough to control the tree where it is intended to go and weak enough to break rather than split the tree when stressed. Cut the last 5-7 years of growth rings as they are the most likely to split.





Other trees slab easily. This means that while they are falling they may split a piece of wood off the front of the tree. Some other trees may split or pull fibers easily. The easiest way to reduce these types of damage is to cut the sides of the hinge and bore out the center of the hinge. This leaves a felling hinge that more closely resembles a door hinge.





The previous technique can also be used for trees that may get hung up on the way down because of the dense forest. By boring out the center of the hinge and creating a hinge approximately 1 1/2 to 2 inches on each side, the tree can break off one of these hinges and allow it to roll, finding its' own way to the ground.

The same technique of boring through the hinge can also be used on trees which are very large. By boring through the hinge and sweeping the center of the tree, it allows a short saw bar to effectively fell large trees.

You've Got Gall!!

We frequently receive inquiries from landowners concerned about strange growths and deformities on the leaves and branches of their trees. Such occurrences on oak trees tend to be a major source of concern since these deformities frequently tend to be large and often grotesque looking. When we tell the inquirer that they have gall, it often elicits some interesting responses.

The deformities that occur on the leaves and branches are a result of insect attack on the tree and the deformities that result are called galls. Galls come in an endless variety of forms. Many are strikingly colored or curiously shaped. Each gall-making species causes a gall structurally different from all others. Galls are irregular plant growths which are stimulated by the reaction between plant hormones and powerful growth regulating chemicals produced by the insects or mites that attack the tree. One or more insects develops inside the gall and eventually emerges as an adult(s). The inhabitant inside the gall gains its nutrients from the inner gall tissue. Similarly, the gall provides some protection for the developing insect from natural enemies and insecticide sprays. Once the gall forms around the developing insect, insecticides are of little use as they do not penetrate the gall.

Surprising, there are over 700 different types of galls that form on the flowers, leaves and twigs of oak trees, but little is know about the life cycle of many of the gall-forming mites, midges and wasps that create them. Wherever oaks occur, they are attacked by a group of tiny wasps, mostly less than 1/8-inch in length, called cynipid wasps. There is more than 700 different species of gall wasps and many of them account for more than three-fourths of the galls formed on oak trees.

Cynipid wasp adults are small (less than ¼-inch), antlike, and jet black in color (see illustration below). They do not sting or attack humans or animals and thus are no threat to adults, children or pets. Gall makers must attack a tree or plant at a particular time in the year to be successful. Otherwise they may not be able to stimulate the plant to produce the tissue which forms the gall. Generally, initiation of leaf galls occurs around "bud break" or as new leaves begin to unfold in the spring.

Cynipid Wasp (enlarged)
NC State Univ.

Female cynipid wasps lay eggs into actively-growing branch buds. Wasp larvae hatch from the eggs and their feeding on the leaf tissue causes a reaction in oak leaves that forms a gall. As the gall tissue envelopes the larva, it continues to feed on the gall tissue, pupates within the gall, and then finally the mature adult wasp chews an exit hole in the gall to emerge.

Oak leaf galls (see Photo 1) are generally not considered life-threatening to the tree and therefore are seldom considered a problem. They are more likely a nuisance factor to homeowners and landowners since they visually degrade the appearance of the tree. However, some people like the unique appearance that leaf galls give to the tree.

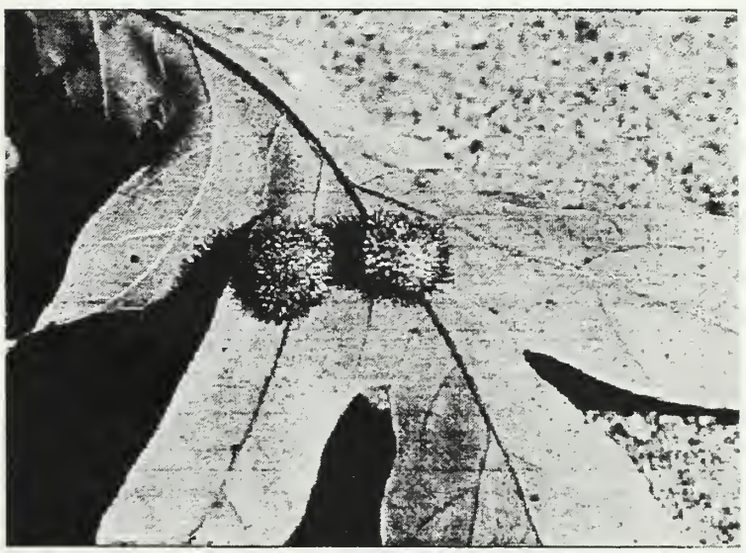


Photo 1. Leaf Galls on Oak, Michigan State Univ.

Oak galls that do cause damage and possible mortality of the tree are the horned oak gall and the gouty oak gall. These galls form on twigs and stems and are solid, woody masses that can girdle branches or make them droop from the sheer weight of the heavy growths. The galls can grow to more than 2 inches in diameter and frequently form adjacent to each other so that entire twigs are enveloped. As the gall envelopes the twig, it chokes off the flow of nutrients to the end of the twig and thus this part frequently dies. If there are only a few galls, the tree's vigor is not impacted much. However, if there is a heavy infestation of galls, particularly on a small, young tree, with many dying branches, this can severely weaken the tree and its eventual death could occur.

Horned oak and gouty oak galls have a long and complex development that takes two or more years to develop. The galls are caused by a cynipid wasp. The first stage is a blister-like leaf gall that occurs along larger leaf veins. Adult wasps emerge from the vein galls around mid-July. These wasps mate and the females lay their eggs in oak twigs. The second stage is a knotty twig gall that starts in mid-summer and becomes fully mature in 1 to 2 years. Adult wasps emerge from the galls in the spring.. Gouty oak twig galls are

smooth. Horned oak galls have horn-like projections (see Figure 2). One adult wasp can emerge from each horn and begins to lay eggs in the developing leaf buds, thus starting the life cycle anew (see Illustration A).

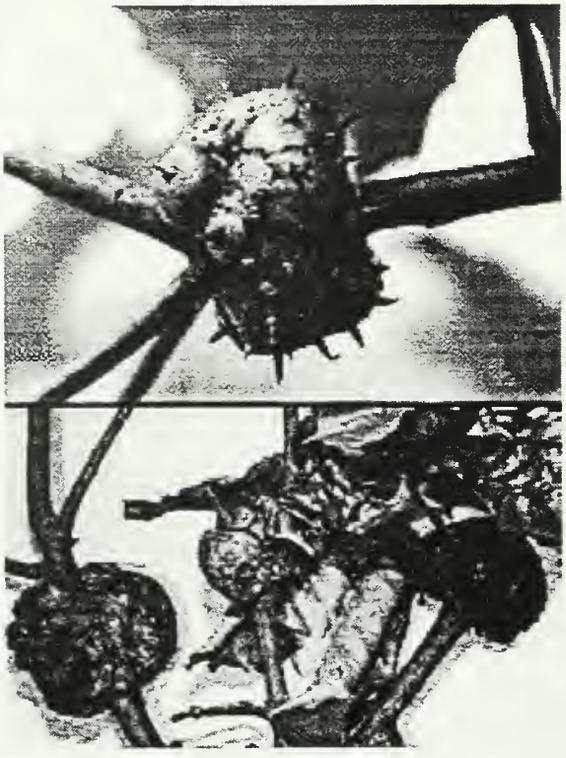
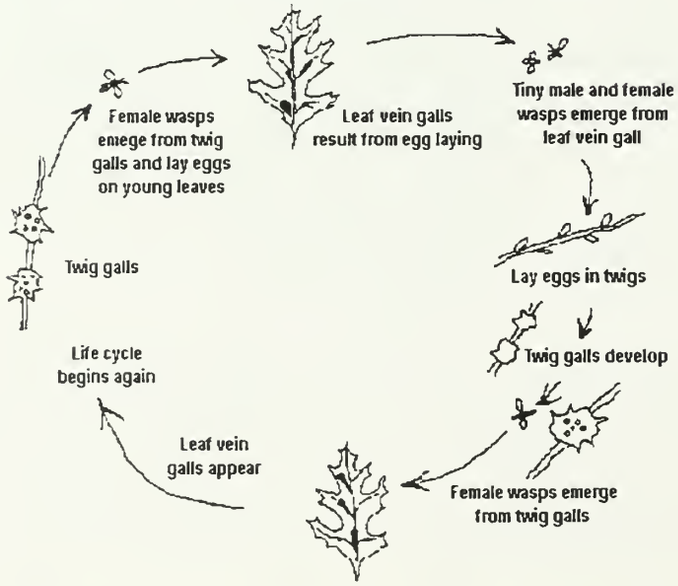


Figure 2. Horned Oak Gall (top), Gouty Oak Gall (bottom)
IL Natural History Survery

Illustration A. Cornell University

Some Observations on the Life History of the Horned Oak Gall:



Another large (1 to 2 inches in diameter) gall that frequently appears on oak trees is the oak apple gall. This round, golfball-like growth is filled with a spongy mass (see photo below). A single wasp larva is located in a hard seed-like cell in the center. Oak apple galls are usually found on the petioles or midribs of leaves. They will dry to a brown, paper-thin wall with practically no weight. They cause no appreciable damage to the tree.

So what are your options for control if your oak tree is covered with galls? Not much to your liking I'm afraid. Once the gall forms, there is little that can be done to control the insect developing inside until it emerges as an adult. As the adults emerge, timing of insecticide sprays is critical to insure adequate control. Normally only a treatment window of 3 to 7 days exists for spray treatment with an insecticide. Some sources report that the insecticide Sevin (carbaryl) provides some control by killing adult wasps as they emerge from the galls. Other sources indicate that the use of an insecticide to control adult wasps emerging from the galls actually increases future gall formation since the insecticide also kills beneficial predatory insects that prey on the adult wasps. By reducing the population of natural predators, the population of surviving adult wasps can explode leading to an even more severe gall problem.

Once the gall forms and is noticed, it is too late to treat. The gall will remain until it is destroyed. If you have trees infested with leaf galls harboring developing larva that will emerge from the gall as adults in the spring, the best control measure would be to rake up the gall-infested leaves as they fall from the tree and burn them.

Similarly, if your tree is infested with twig gall, such as horned oak- or gouty oak gall, any twig with a gall should be pruned off behind the gall when the wasp is still inside the gall and burned. This is not too practical for large trees with many galls, but professional treatment with an insecticide will be an expensive proposition that will not solve the problem. Once the galls have been removed, the tree should be fertilized to improve its vigor.

For more information on oak galls, you can contact this newsletter or Dr. James Appleby, Forest Entomologist with the University of Illinois Department of Natural Resources and Environmental Sciences, at 217-244-3431.

SOURCES: Home, Yard & Garden Newsletter, University of Illinois Extension; University of Kentucky Department of Entomology; Cornell University; Virginia Tech Cooperative Extension Service.

ILLINOIS TIMBER PRICES

Illinois Agricultural
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Springfield, IL 62794-9283
Ph (217) 492-4295
U.S. Department of Agriculture

DIVISION OF FOREST RESOURCES
600 North Grand Avenue West
Springfield, Illinois, 62706
Phone: (217) 782-2361

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

December 14, 2000

PRICES PAID ILLINOIS TIMBER PRODUCERS
MAY 2000 THROUGH AUGUST 2000

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones, based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report. Of the timber buyers reporting volume of their 2000 operations, 44% indicated their volume was 500 thousand board feet or more.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS
SAWTIMBER - $ PER M BD. FT.

SPECIES	May 1999 - August 1999		November 1999 - February 2000		May 2000 - August 2000	
	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
Ash	160	270	150	270	160	310
Basswood	110	200	120	260	130	240
Beech	75	170	80	180	75	200
Cottonwood	65	150	70	160	60	160
Sweet Gum	75	180	80	170	75	180
Elm & Hackberry	75	180	70	180	75	190
Hickory	110	200	100	210	120	210
Soft Maple	110	200	100	210	120	240
Sugar Maple	170	280	170	350	210	350
Black Oak	160	260	150	290	170	290
Pin Oak	95	180	80	180	85	190
Red Oak	230	360	220	350	250	370
White Oak	230	350	210	350	240	400
Yellow Poplar	120	290	130	280	150	280
Sycamore	80	180	70	180	75	190
Black Walnut	330	500	300	500	390	520
Woods Run Bottomland	90	190	95	200	110	210
Woods Run Upland	150	260	170	250	180	260
FACE VENEER - $ PER M BD. FT.						
Red Oak	610	910	530	900	630	1,000
White Oak	1,010	1,670	1,050	1,630	980	1,600
Walnut	1,720	3,120	1,540	2,460	1,720	1,980
COOPERAGE - $ PER M BD. FT.						
White Oak	290	550	300	570	260	470
UNPEELED PULPWOOD - $ PER TON						
Ton	3.00	21.00	3.30	21.80	3.60	18.20

-OVER-

Timber Prices
May 2000 - August 2000
December 14, 2000

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
May 2000 - August 2000

PRODUCT	UNIT	Zone 1		Zone 2		Zone 3	
		Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
1. Sawtimber				Dollars			
Ash	M bd. ft.	80-200	160-470	70-300	200-400	100-200	200-400
Basswood	M bd. ft.	75-100	150-225	60-300	200-350	70-200	180-270
Beech	M bd. ft.	50-125	150-245	70-80	200	50-100	N/A
Cottonwood	M bd. ft.	40-80	100-240	35-100	150-200	40-90	100-180
Sweet Gum	M bd. ft.	50-100	100-200	60-80	170-200	50-100	N/A
Elm & Hackberry	M bd. ft.	50-125	100-240	50-100	170-200	50-100	175-200
Hickory	M bd. ft.	60-200	120-275	50-210	150-300	50-200	180-220
Soft Maple	M bd. ft.	50-200	150-375	50-200	150-350	100-200	150-300
Sugar Maple	M bd. ft.	80-250	200-500	70-400	200-600	125-400	200-700
Black Oak	M bd. ft.	100-200	200-450	70-400	100-650	55-300	70-500
Pin Oak	M bd. ft.	50-120	150-240	50-110	180-220	70-115	150-200
Red Oak	M bd. ft.	150-300	300-600	180-400	100-600	110-400	100-550
White Oak	M bd. ft.	200-350	390-625	70-400	200-600	110-350	150-450
Yellow Poplar	M bd. ft.	100-250	200-400	70-190	200-500	N/A	N/A
Sycamore	M bd. ft.	50-100	150-220	50-100	150-350	50-100	150-180
Black Walnut	M bd. ft.	100-500	200-700	200-450	400-800	225-860	110-700
Woods Run Bottomland	M bd. ft.	75-240	150-360	60-150	180-275	100-160	190-220
Woods Run Upland	M bd. ft.	80-250	160-400	70-220	180-200	170-250	250-350

		STATEWIDE	
		Stumpage	F.O.B. Mill
2. Face Veneer			
Red Oak	M bd. ft.	300-1,000	600-1,500
White Oak	M bd. ft.	300-1,500	600-2,500
Walnut	M bd. ft.	800-3,000	600-3,000
3. Cooperage			
White Oak	M bd. ft.	200-345	400-500
4. Pulpwood			
Unpeeled	M bd. ft.	2.00-5.00	17.00-19.00

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	97
Scribner	3
International	-

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rated Reported $/M bd. ft.
Zone 1	17	100-200
Zone 2	35	150-300
Zone 3	4	100
Illinois	19	100-300

VOLUME OF 1999-2000 OPERATIONS

Size in (000) bd. ft.	Zone 1 %	Zone 2 %	Zone 3 %	All %
1 - 100	22	28	28	27
100 - 500	56	17	28	29
500 - 1,000	-	5	11	7
1,000 - 3,000	11	33	17	22
3,000 +	11	17	16	15

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer" used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

MARKED TIMBER SALES - MAY 2000 - AUGUST 2000
STATEWIDE STUMPAGE

Woods Run Upland	$183-$350/M bd. ft.
Woods Run Bottomland	$186-$274/M bd. ft.

*Prices supplied to District Foresters by seller, may include some veneer.

Brad Schwab, State Statistician

Mike Green, Rick Kestle, Agricultural Statisticians

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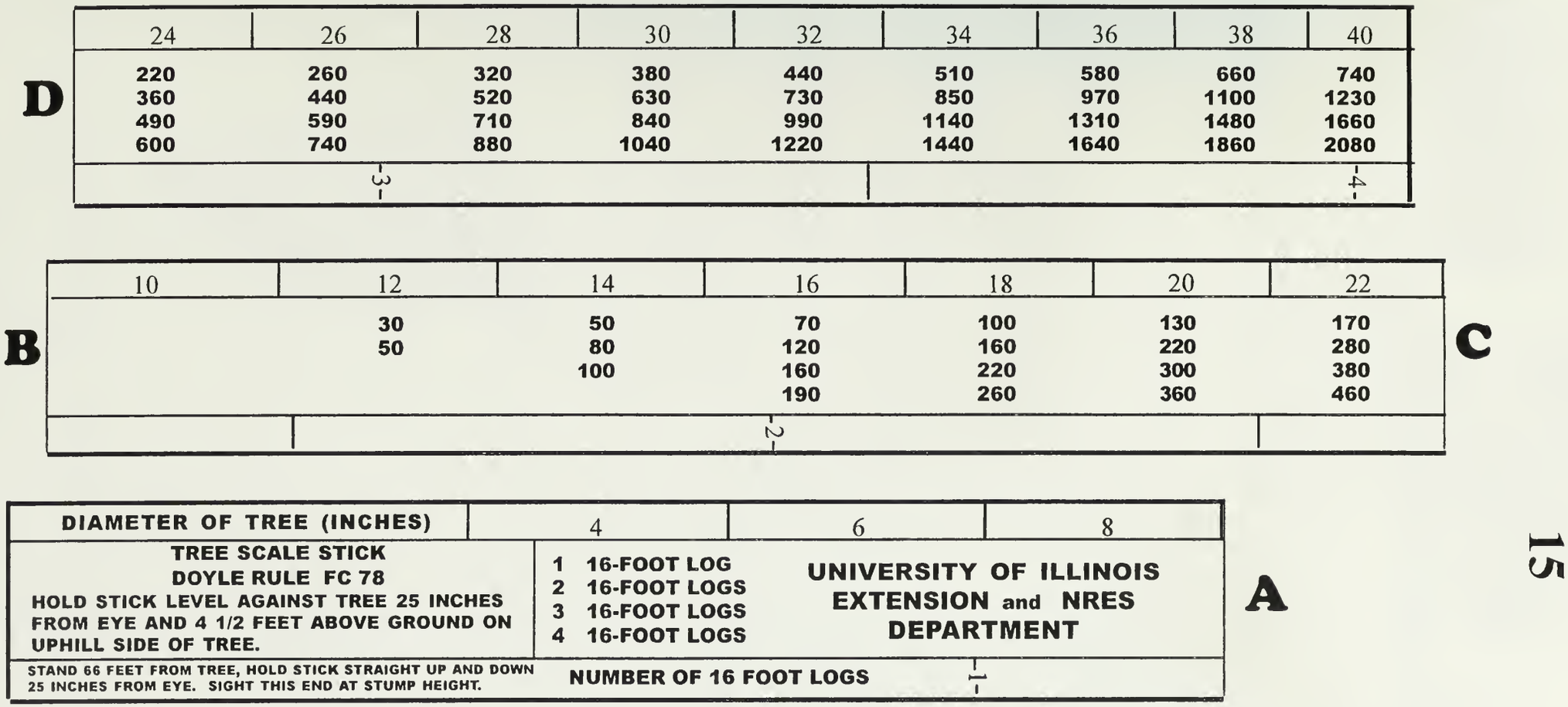

Cut out each section of the tree scale stick on the outside edge of the black line. The scale stick is designed to fit on a yardstick. Apply rubber cement to the back of each section of the scale stick and stick it on the yardstick. Align the zero end of the scale stick flush with the zero end of the yardstick. Butt ends A & B of the scale stick together. Butt ends C & D together. When the scale stick is mounted on the yardstick, cover the scale stick and yardstick with clear contact paper. This will protect the scale stick against moisture and wear. Clear contact paper is available from K-Mart, WalMart, Target, etc.

The numbers (4 through 40) at the top edge of the stick represent even diameters. The line between each number represents the odd diameters (17, 19, 21, etc.) The numbers (1 through 4) on the bottom side of the stick represent 16-foot logs that can be cut from the tree. The line between each of these numbers represents a half-log.

The black numbers below each diameter measurement are the number of board-feet that can be cut from a tree with that specific diameter and number of 16-foot logs.

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UNIVERSITY OF ILLINOIS EXTENSION

ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

Volume 1, 2001 No. 40

LAST PAPER ISSUE

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IN THIS ISSUE

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and University of Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801.

Illinois Woodlands Under Siege

There is a revolution occurring throughout Illinois. It's not one that makes headlines in the newspaper or is the featured story on the 6 o'clock news, but it is a serious revolution none-the-less that is impacting many of Illinois' private and public woodlands. This silent revolution is the ousting of our native plant species by exotic, invasive species. Most landowners are unaware that this is happening and that their woodland is under siege. Many landowners even enjoy the picturesque flowering that occurs in their woodland when these exotic species flower. The upshot is that many of these exotic species have no natural enemies or predators and once they become introduced into your woodland, they quickly become establish and spread rapidly throughout the forest floor shading out most of the native groundcover, wildflowers, shrubs and small tree species. Soon all that is left is a forest understory of the invasive species. It is estimate that likely one-third of the plants you find in Illinois woodlands are not native plant species.

Our woodlands are not the only environments being threatened and invasive plant species are not the only exotic threat. There are many exotic animal species that inhabit Illinois aquatic and terrestrial habitats. For a better understanding of exotic-invasive species and the serious threat they are to our native plant and animal populations the following information from an Illinois Natural History Survey report on Invasive Species is reprinted:

Invasive Species - Issues

The first European settlers in North America brought with them several domesticated animals and a variety of plants for food, fiber, garden, and medicinal purposes. They also brought unintended species, such as the house mouse, Norway rat, housefly, and nu-

merous weeds, including dandelions. Over the years, a great number of other non-native species have been brought to this continent from all over the world. Some of these species have been able to reproduce on their own and are thoroughly naturalized.

Exotic, invasive species (EISp) are those organisms that arrive in a new habitat and cause harm to the local flora and fauna. Their populations often increase unchecked because evolved predator/prey relationships were not transferred with them, and hence there are no natural predators or diseases of these species. The kinds and magnitude of threats posed by EISp are numerous and increasing in Illinois. Exotic species have invaded and in the future will invade all types of human-manipulated and natural habitats. In fact, a new invasive species, the Asian longhorned beetle, was *discovered (and is being controlled)* in the Chicago. In Illinois, the EISp problem is exacerbated by three significant factors: 1) due to its geographic location and features, Illinois is a prime transportation hub in the U.S., and movement of trade and commercial goods through the state occurs via rail, road, waterway, and air; 2) the already reduced acreage of natural habitats in Illinois makes these areas and the species they contain increasingly threatened and endangered by development and EISp; and 3) although several individual projects address EISp, there is no concerted effort at the state level to bring together a broad array of scientists and habitat managers, representing diverse expertise and perspectives, to address the problems of EISp at an ecosystem level. Although many native species (e.g., white-tailed deer, beaver, black locust trees) also are ecological problems or nuisances in Illinois, those problems have different causes and different solutions.

[Editor's Note: At the time this background report was prepared, Item 3 above was true. The Illinois Department of Natural Resources' Natural History Survey (INHS) is actively involved in the detection of new exotics species and to study their impact both on our environment and economy. INHS scientists are developing strategies to prevent introductions of new invasive species and control invaders that have already arrived or at least limit their spread and harmful effects.]

A vast array of EISp have invaded Illinois habitats—aquatic, terrestrial, agricultural, natural areas, and urban forests. EISp harm Illinois in several ways. EISp compete with native species that are threatened by habitat fragmentation or human-induced disturbance, and thus the added effect of EISp can be severe. Illinois is developed and disturbed more intensively than many other states, thus the threats and pressure from EISp likely are surpassed only in Hawaii and Florida. Deleterious impacts can have environmental, economic, or even human-health costs. For example, exotic weeds that have invaded Illinois threaten the long-term existence and function of forests, prairies, and wetlands, and directly impact plants and animals in these habitats. In agricultural habitats, exotic weed and insect pests cause crop losses, lead to large-scale application of pesticides, and limit commerce via quarantines. Nationwide, annual crop losses from exotic insects exceed $92 billion, and losses from exotic weeds exceed $5 billion. Although quantifying environmental costs of EISp is difficult, EISp devalue natural lands that have been the focus of environmental investment as long-term ecological island habitats in Illinois. Since 1991, the Natural Areas Acquisition Fund has acquired 8,100 acres at a cost of $12 million. The Nature Preserve System in the state protects 35,000 acres, worth over $50 million. In addition, the Illinois Department of Natural Resources owns 400,000 acres of land worth more than $600 million. Finally, several EISp are associated with threats to human health, such as the arboviruses vectored by the Asian tiger mosquito.

Many exotic species occur in Illinois, but not all have become pests or have major impacts. However, once established and spreading, many EISp defy control measures, which are often limited, unavailable, economically not viable, or socially (and environmentally) unacceptable. For example, large-scale use of insecticides throughout northeast Illinois might deter the incipient invasion of gypsy moth, but could harm local insect and bird fauna and would cause an uproar in urban and suburban areas. The spread of aquatic species, such as the round goby, could be curtailed by chemical or electrical barriers, but the costs are potentially great and these barriers could harm other species. Devising intervention measures that are acceptable and cause the least conflict and disruption of economic and environmental systems will be crucial.

Added to the problems of EISp is the lack of concerted measures to access the current status and impacts of EISp, to predict potential EISp, and impose control measures. Different state agencies or entities in a single organization often are unaware of ongoing projects, thus efforts either can be duplicative or at odds with each other. Some EISp problems are due to competing interests: the Ringneck Pheasant is a valuable game bird but also impacts native ground-nesting grassland birds; exotic fish stocked for fishing or weed control compete with native fish or alter food webs; exotic plants (e.g., Japanese honeysuckle, autumn olive, multiflora rose, crown vetch) promoted for erosion control or wildlife habitat displace native plants.

SOURCE: www.inhs.uiuc.edu/chf/pub/an_report/97_98/projects.html#invspec

NEW INVASIVE PLANT SPECIES SERIES!!!

In this issue of *Illinois Forest Management Newsletter*, we will begin a new series in our newsletter entitled **"Coming to a Woodland Near You"** that deals with exotic-invasive species that are impacting our woodlands in Illinois. The article will focus on a specific species and will help you identify it, understand its life history and its impact on your woodland, and how you can attempt to control it. We will use information from many sources to help keep you informed on this serious, but silent, malady.

Coming to a Woodland Near You

— Exotic Species & How to Deal with Them —

Garlic Mustard

DISTRIBUTION AND HABITAT:

Garlic mustard is an exotic species introduced from Europe presumably by early settlers for its supposed medicinal properties and for use in cooking. It is widely distributed throughout the northeastern and Midwestern U.S. from Canada to South Carolina and west to Kansas, North Dakota, and as far as Colorado and Utah. Garlic mustard grows in upland and floodplain forests, savannas, yards, and along roadsides, occasionally in full sun. It is shade-tolerant, and generally requires some shade; it is not commonly found in sunny habitats. It cannot tolerate acidic soils. The invasion of forests usually begins along the wood's edge, and progresses via streams, campgrounds, and trails.

LIFE HISTORY AND EFFECTS OF INVASION:

This species is a biennial that produces hundreds of seeds per plant. The seeds are believed to be dispersed on the fur of large animals such as deer, horses, and squirrels, by flowing water and by human activities. In our areas, seeds lie dormant for 20 months prior to germination, and may remain viable for five years. Seeds germinate in early April. First-year plants appear as basal rosettes in the summer season. First-year plants remain green through the following winter, making it possible to check for the presence of this plant in your woods throughout the year. Garlic mustard begins vegetative growth early in the spring, and blooms from May through early June. Fruits begin to ripen in mid-July, and are disseminated through August. Viable seeds are produced within days of initial flowering.

Garlic mustard is a rapidly spreading woodland weed that is displacing native woodland wildflowers in Illinois. It dominates the forest floor and can displace most native herbaceous species within ten years. This plant is a major threat to the survival of Illinois woodland herbaceous flora and the wildlife that depend on it. Many native wildflowers that complete their life cycles in the springtime (e.g., spring beauty, wild ginger, bloodroot, Dutchman's breeches, hepatica, toothworts, and trilliums) occur in the same habitat as garlic mustard. Once introduced to an area, garlic mustard outcompetes native plants by aggressively monopolizing light, moisture, nutrients, soil and space. Wildlife species that depend on these early plants for their foliage, pollen, nectar, fruits, seeds and roots, are deprived of these essential food sources when garlic mustard replaces them. Humans are also deprived of the vibrant display of beautiful spring wildflowers. There are two modes of spread: an advancing front, and satellite population expansion possibly facilitated by small animals. Unlike other plants that invade disturbed habitats, garlic mustard readily spreads into high quality forests.

DESCRIPTION:

Garlic mustard is a cool-season biennial herb that ranges from 12 to 48 inches in height as an adult flowering plant. Leaves and stems emit the distinctive odor of onion or garlic when crushed (particularly in spring and early summer), and help distinguish the plant from all other woodland mustard plants. First-year plants consist of a cluster of 3 or 4 round, scallop edged leaves rising 2 to 4 inches in a rosette. Second-year plants generally produce one or two flowering stems with numerous white flowers that have four separate petals. Garlic mustard is the only plant of this height in our woods with white flowers in May. Fruits are slender, four-sided pods or capsules 1 to 2.5 inches long called siliques that produce a single row of oblong black seeds with ridged seed coats. Siliques become tan and papery as they mature. By late June, most of the leaves have faded away and garlic mustard plants can be recognized only by the dead and dying stalks of dry, pale brown seedpods that may remain and hold viable seed throughout the summer. Stem leaves are alternate and triangular in shape, have large teeth, and can be 2 to 3 inches across in fruiting plants. Petioles are longer on the leaves towards the base. Garlic mustard can also be distinguished by its uproot, which is slender, white, and "s"-shaped at the top of the root.

Garlic Mustard. Illustration: National Botanical Services of Canada

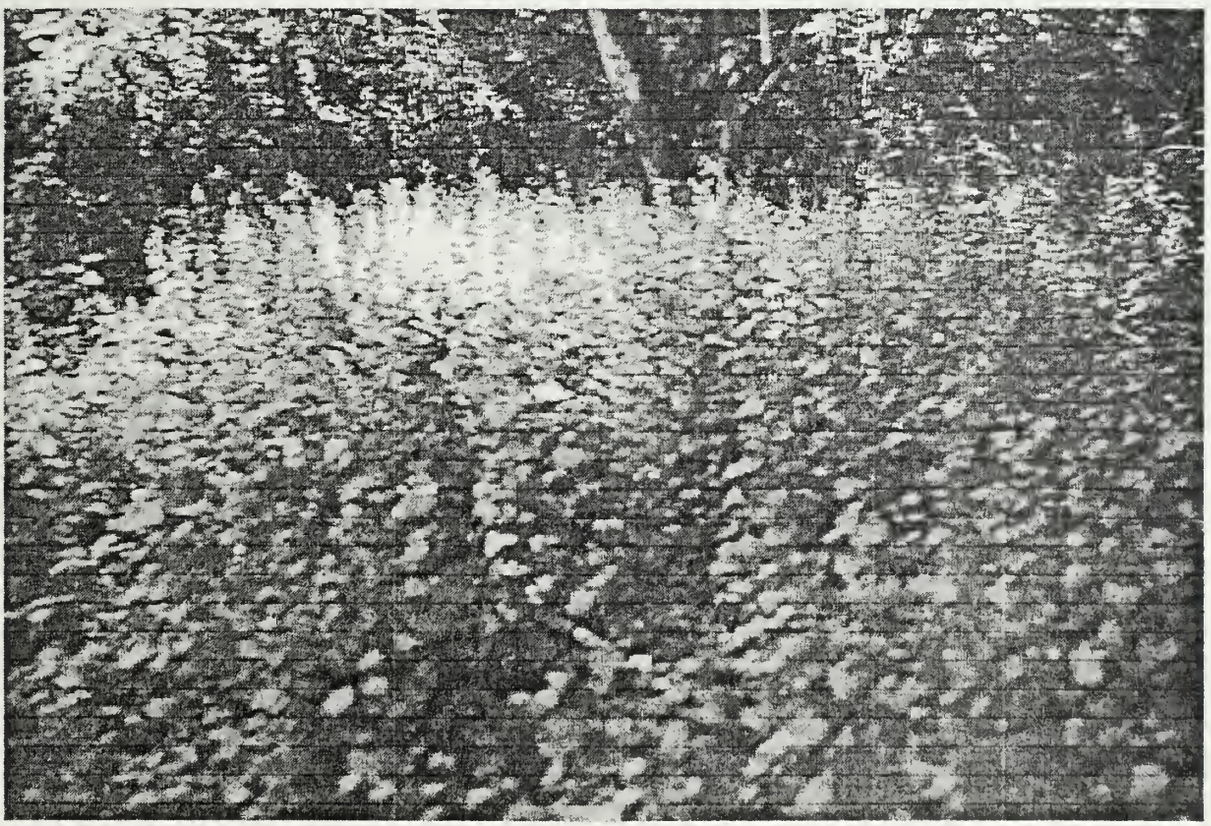
A = Fruit pod referred to as a siliques. B = close-up of flower. C = Close-up of 2nd-year plant with flowers. D = Silhouette of 2nd-year plant. Illustration: Virginia Department of Natural Resources

Leaves of 1st-year plants growing in rosettes. Photo: New England Wildflower Society

Leaves, stalk and flowers of 2nd-year plant. Photo: Ken Robertson, IL Natural History Survey

Flowers and leaves of 2nd-year plant. Photo: WI DNR

Fruiting stalks with pods containing seeds. Photo: TNC Weeds, UC-Davis



Garlic mustard left unchecked will quickly dominate the woodland understory choking out all native ground plants and wildflowers. Photo by J. Randall; Invasive Plant Council of New York State

CONTROLLING GARLIC MUSTARD

MECHANICAL CONTROL:

Minor infestations can be eradicated by hand pulling at or before the onset of flowering, or by cutting the flower stalk as close to the soil surface as possible just as flowering begins (cutting a couple inches above ground level is not quite as effective). Cutting prior to this time may promote re-sprouting. Cutting flowering plants at the ground level has resulted in 99% mortality and eliminates seed production. A scythe, monofilament weed whip, or power brush cutter may be helpful if the infestation covers a large area. When pulling, the upper half of the root must be removed in order to stop buds at the root crown from sending up new flower stalks. Pulling is very labor intensive, and can result in soil disturbance, damaging desirable species, and bringing up seeds from the seed bank. These results can be partially prevented by thoroughly tamping soil after pulling. If, however, seed bank depletion is desired, leave the soil in a disturbed state to encourage further germination, and return annually to remove the plants. In general, cutting is less destructive than pulling as a control method, but can be done only during flower stalk elongation. Once seedpods are present, but before the seeds have matured or scattered, the stalks can be clipped, bagged and removed from the site to help prevent continued buildup of seed stores. Pulling can be done at any time when the soil is not frozen. If flowering has progressed to the point that viable seed exists, remove the cut or pulled plants from the area. Because seeds remain viable for five years, it is essential that an area be monitored and plants removed for at least five years after the initial control effort.

For larger infestations, fall or early spring burning may be effective. First year plants are killed by fire, if the fire is hot enough to remove all leaf litter. However, the bare soil enhances survival of seedlings that germinate after the fire, and the total population may increase after the fire. Dense populations may be controlled more effectively by fall burning, when leaf litter provides adequate fuel. Spring burns should be conducted early enough to minimize possible injury to spring wildflowers. Three to five years of burning are required, and should be followed by hand-pulling or cutting of small populations produced from the seed bank. Garlic mustard plants hit by fire are generally killed. Because most woodland fires are patchy, flame torches may be useful in areas not burned in entirety.

CHEMICAL CONTROL:

Several infestations can be controlled by applying 1% to 2% active ingredient (a.i.) solution of glyphosate (e.g., Roundup) to the foliage of individual plants and dense patches during late fall or early spring. At these times, most native plants are dormant, but garlic mustard is green and vulnerable. Glyphosate is a nonselective herbicide that will kill non-target plants if it comes into contact with them. Managers should exercise caution during application, and not spray so heavily that herbicide drips off the target species. Herbicide use is safest for native plants if done during the dormant season, as garlic mustard will grow as long as there is no snow cover and the temperature is greater than 35 degrees F. An early spring application of triclopyr (e.g. Garlon) at a 1% a.i. concentration in solution with water has been used, resulting in a 92% rosette mortality rate.

Researchers are investigating potential biological control agents for garlic mustard which may greatly improve the control of this insidious weed.

SOURCES:
www.angelfire.com/on2/EVS/garlicmustard.html
http://www.nps.gov/plants/alien/fact/alpe1.htm

The Case for Green Certification

Forest product certification is one of things that you either love or hate, there is no middle ground, no fence-sitting. Those who embrace it see new marketing opportunities and an emerging consumer that wants more from products than just service. Those who hate it decry another layer that spreads profits thinner, or unnecessarily increases production costs. But, as with most things, truth lies somewhere between the extremes: yes, it costs more to produce a certified product, but manufactures who produce 'green' products believe consumers will increasingly demand these products and profitability will follow. This in spite of the fact that recent trends have proved otherwise: consumers tend to be more cost-conscious, choosing the lower-priced item over the more earth-friendly one, at least for now. Retailers like Home Depot and Lowes are attempting to expand their green-certified offerings, but the jury is still out as to whether consumers will create enough demand to make it worthwhile. And there is a healthy debate between environmentalists who fashioned the certification movement with formation of the Forest Stewardship Council (FSC), a Mexico-based, world-wide organization that pioneered forest certification in 1993, and the American Forest and Paper Association (AFPA), which represents forest industry in the U.S. The issue is: Whose imprimatur is more meaningful, and who is eligible to inspect whom?

What is product certification, how and when did it arrive in the U.S.— and why? Is it possible to argue successfully in its favor? Half say "yes," half say "no" and curiously no one is willing to say "maybe." After all, anyone that spends too much time in the middle of the road tends to get hit, sooner or later. But it is still surprising that so many have already made up their minds.

Is forest product certification, now less than decade old, here to stay? Or is it a fad that will disappear with rising housing costs or recession? I am going to argue the case that it is here to stay, and

if you are in the business of manufacturing wood products, it is time to discover and cultivate sources of certified wood, learn about green certification guidelines and explore green markets for your products. According to some experts, there is plenty of unmet demand for certified wood and this is one of the reasons change is so slow, and the potential for profit is high.

The green certification movement emerged in the late 1980's in response to excessive and careless logging in tropical forests. First played out by large companies felling huge swaths of rainforest for wood production and land clearing, even recently enacted laws have not stemmed the flow in some third-world countries. The developed world's taste for exotic woods feeds a growing market for tropical hardwoods that rivals, in some circumstances, markets for illegal drugs. In other words, it is worth more—not to mention safer—for a *campesino* in Nicaragua to pirate rare trees from surrounding rainforests than to, for example, cultivate marijuana. Of course, most American and European consumers have no idea that the picture frames, moldings, fine furniture and other such products they buy are supporting devastating practices far from home. Felling and extracting a single, 300-year-old tree can take a small crew a couple of weeks to accomplish, leaving behind many hectares of damage from vines that rake the forest floor as the crop tree falls. But the rewards far outweigh the effort and risks, and pretty soon everybody and their brother is out looking for valuable trees, extracting them flitch-by-flitch on the back of burrows. A once legitimate market that proved devastating to tropical rainforests became a lucrative black market in a matter of a few years, and the effects are still devastating.

When conservation groups started getting the word out about these practices, there was so much market inertia that it seemed as if cutting would stop only after all the valuable trees had been harvested. Change was slow, too slow for those who witnessed the effects of crude and careless extraction practices, not to mention the devastating effects on already threatened habitats. Governments of third-world countries were fairly quick to react, but powerless to control the steady stream of now illegal exports. It is impossible to stem the flow of wood without stanching demand (which, tangentially, is also the problem behind illegal drugs and the reason source countries point the finger at the U.S.), and this is where the concept of product certification was born. Educate consumers about the perils of buying tropical woods, they stop buying them, eventually demand dries up and campesinos go back to cultivating whatever.

Forest product certification got started as a way to eliminate lucrative markets for sensitive tropical hardwoods. In theory, the eventual groundswell of demand for certified wood will mostly displace demand for uncertified wood, and everybody wins. So far, this has not proven to be the case, but changing the habits of consumers takes time and there is a lot of money betting that green products will catch hold in a big way.

According to a May 2001 Wall Street Journal article, AFPA has hired True North Communications—the same company that developed the wildly successful "Got Milk?" campaign—to develop a $25 million advertising effort to promote its Sustainable Forestry Initiative imprimatur for its member companies. Although accused of 'green washing' by FSC supporters, one thing is sure: a lot of people think forest product certification is here to stay.

Fortunately, we don't have the same forest utilization problems in the U.S. as in tropical regions, but there is still room for improvement in the way we harvest and use forests. The utilization problems are different but the principles behind good practices that define sustainable forests are exactly the same: use the best methods to harvest and extract timber while protecting forest soils and habitats. A certified forest is one that—above all else—maintains the integrity of forest ecosystems; human use is secondary. A certified forest product is akin to 'organically' grown produce, which has established a substantial niche market in the grocery industry in less than 20 years.

The Forest Stewardship Council is presently the only world-wide forest and forest product certification organization. It espouses ten principles to which a woodland owner or wood manufacturer must adhere to receive and maintain certification. The principles require an ecosystem-approach to management and a commitment to sustain wood production while protecting plant and animal diversity, wildlife habitats and other forest values. Third-party "auditors", usually foresters but manufacturing control experts as well, visit candidate woodlands and wood product businesses to determine whether or not the practices meet FSC standards. To qualify, the components of products must be auditable as to chain-of-custody from forest to consumer, and every step of the process must meet FSC guidelines. Producers that adhere can market products with the FSC logo, retailers advertise the earth-friendliness of the product, and consumers can feel good about protecting the planet. The idea is similar to a grade stamp on lumber, but it has nothing to do with wood quality or value, rather on how it was produced.

To date FSC has certified about a million acres in the U.S., and more than 30 million acres in 37 countries worldwide. The key to FSC's program is third-party certification and verification of the chain-of-custody. Periodic audits of certified producers ensure that standards for practices and products are continuously maintained. The costs for initial certification and subsequent audits are high, and this has been an issue with small primary wood processors and woodland owners who don't yet feel that those costs can be easily recouped by selling FSC-certified products. So far, most are right; but some producers have obtained niche markets for their products and are doing quite well. Others see certification as an investment in the future.

AFPA, sponsor of the popular Tree Farm program, developed the Sustainable Forestry Initiative in 1995, a few years after it appeared

that FSC was making progress. Coincidental or not, critics say AFPA's purpose was to thwart third-party certification, to squelch a movement created and controlled primarily by environmental interests. Although AFPA has yet to roll out its imprimatur, it requires third-party audits same as FSC. The difference is that the process is controlled by industry, creating the appearance of a "fox in the hen house" and throwing consumer credibility out the window. Without credibility it is not long before consumers begin to feel like they are paying for the equivalent of air in the cereal box.

AFPA also requires its members who want to use the imprimatur to accept and adhere to a broad set of principals, same as FSC. But the organizations differ on things like the allowable maximum size of clearcuts (AFPA says 120 acres, FSC says no more than 40 acres) and on the use of chemicals (AFPA says they are essential, especially herbicides in plantations, FSC advocates practices that don't use chemicals). The "them-versus-us" posture of the debate risks losing faith of consumers altogether, but it is doubtful even a feud will stop what amounts to a brand-recognition dispute.

The rivalry between FSC and AFPA aside, critics of green certification say it is fad. When the economy slows down, mills won't be as discriminating of suppliers and consumers will look for best buys and, so far, this has proven to be the case. With no discernable difference in products other than label and price, consumers who don't feel wealthy and magnanimous will always pick the best buy, conscience be damned. Tough times have an effect on consumer preferences, but most experts still agree that sustainable forestry and product certification will become more prevalent, not less.

Who will prevail: FSC or AFPA? There is no question that AFPA has the financial clout to build recognition among consumers for its certified products, and the success of certification depends on the perceptions of consumers. But the FSC logo is already in stores, and big retailers like Home Depot have made commitments to carry more green products. FSC is also an international organization and its logo is recognized around the world. With the next great boom cycle most likely driven by globalism, the situation weighs heavily in favor of FSC. Any chance the two can work together? Not likely, but stranger things have happened.

This is an article written by Thom McEvoy, Vermont Forestry Extension and appeared in The Forest Products Equipment Journal, October 2001. It is reprinted here with permission of the author.

EDITOR'S NOTE: For more information about the Sustainable Forestry Initiative (SFI) or the Forest Stewardship Council (FSC), check out these web sites:

SFI = www.afandpa.org/forestry/sfi_frame.html

FSC = www.fscoax.org/

The following article is a continuation in the series of **Tim's Tips** articles reprinted from the logger training manual developed by Mike Bolin, Extension Forester and Tim Ard, president of Forest Applications Training, Inc. for the ***Illinois Pro Logger Training Program***. The chain saw safety and timber felling information is useful for landowners who own and use a chain saw on their property.

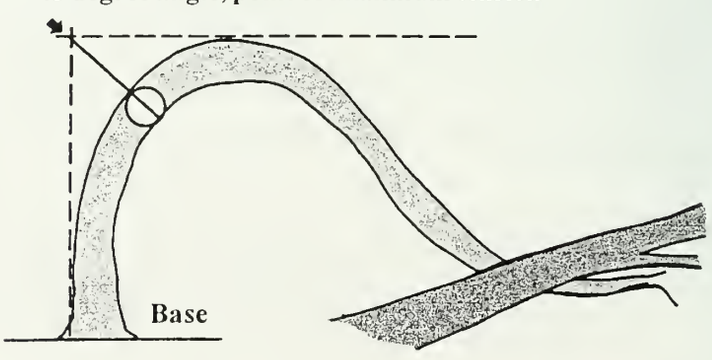
Managing Spring Poles

During any harvesting operation loggers and landowners will encounter spring poles. As a felled tree falls, it bends over small trees and saplings pinning them to the ground. Spring poles are time bombs waiting to go off, and if you do not know how to deal with them safely, they can easily mame or kill the chain saw operator. A spring pole is defined as any obstacle that is bent over and pinned on one end and anchored in the ground at the other, normally by the roots. Bent limbs on the felled tree can also act like spring poles. We will discuss how to deal with them safely in a future article.

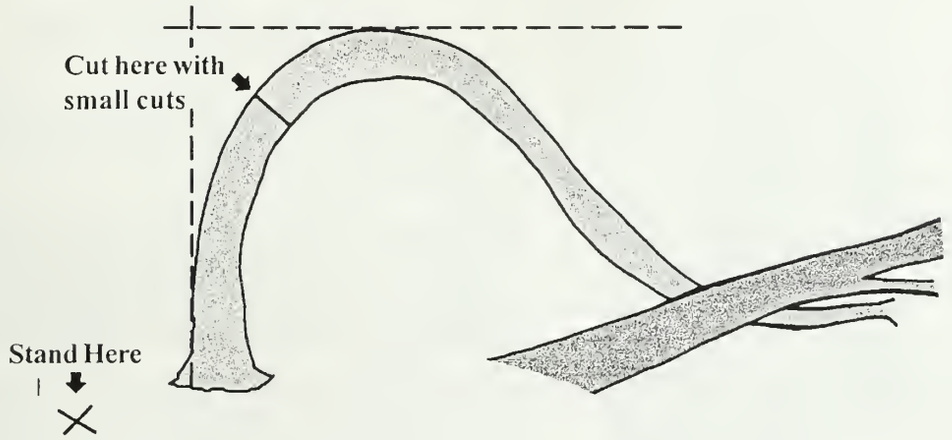
The best way to manage spring poles is to avoid them. However, if a spring pole must be cut it should be done in a safe manner. The best way is to release the tension slowly at the maximum point of tension.

To locate the maximum point of tension, extend a vertical line from the base of the tree and a horizontal from the highest point of the spring pole. From the intersection of these two lines imagine a 45 degree angle to the spring pole. This point on the spring pole will have the maximum amount of tension.

45 degree angle, point of maximum tension

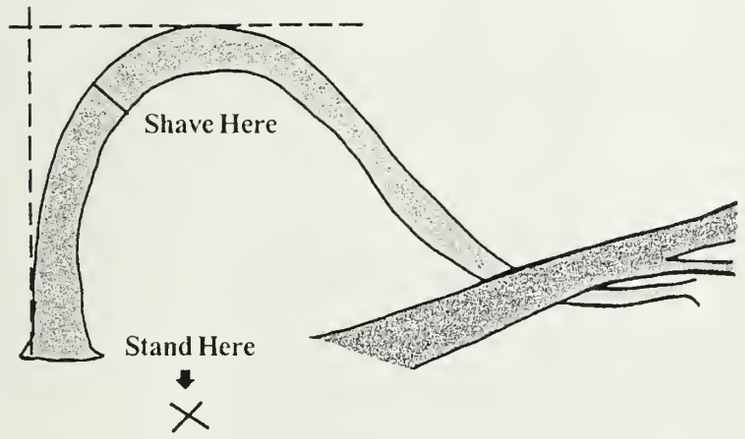


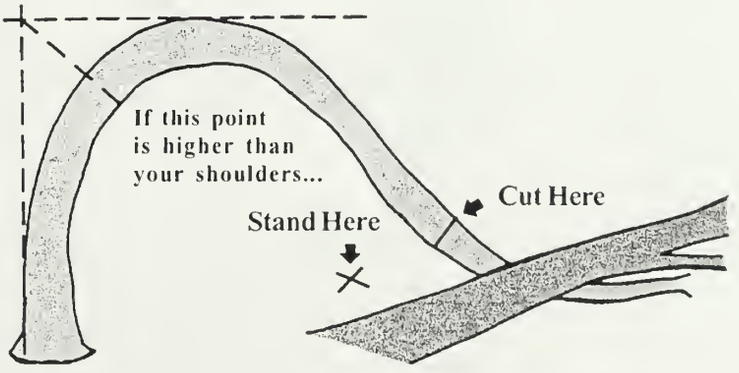
Spring poles may be cut from underneath or from the top. If you choose to cut a spring pole from the top, you must stand at 45 degrees to avoid being hit by the spring pole if the tension is released suddenly. From this position, the chain saw can be used to make a succession of small cuts at the maximum point of tension until the fibers begin to break by themselves. This cut must be made with saw running at maximum RPM with a slow rate of feed. At this time, the logger should move away from the tree and let the pressure release itself. The spring pole can then be cut off.



Spring poles may also be released from underneath. To do this, the saw operator should stand at 90 degrees to the spring pole and use the chain saw to shave wood off the underside of the spring pole at the maximum point of tension (see the left illustration below). Do not cut into the spring pole as the compression of the wood will pinch the saw. After enough wood is shaved, the fibers will begin to break by themselves and the saw operator can stand aside and let the spring pole release its' tension naturally.

If the point of maximum tension on the spring pole is higher than the shoulders, the spring pole should be released from the top. The logger can stand under the spring pole, trim any branches that may be in the way and then release the spring pole by cutting off the top (see the right illustration below). The spring pole should fly harmlessly above the logger and not cause injury.





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ILLINOIS TIMBER PRICES

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ILLINOIS DEPARTMENT OF NATURAL RESOURCES

September 10, 2001

PRICES PAID ILLINOIS TIMBER PRODUCERS NOVEMBER 2000 THROUGH FEBRUARY 2001

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by licensed timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price-reporting zones, based on timber resources, similarity, utilization standards and practices and soil types. Zone 1 is the Southern Unit; Zone 2, the Claypan Unit; and Zone 3, the Prairie Unit. Ranges of prices for each zone are shown on the back of this report. Of the timber buyers reporting volume of their 2000 operations, 51% indicated their volume was 500 thousand board feet or more.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price-determining factors. Certain local considerations such as accessibility, site and terrain, distance to market, size of sale, and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester, or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue, West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS

SPECIES	November 1999 - February 2000		May 2000 - August 2000		November 2000- February 2001	
	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
SAWTIMBER - $ PER M BD. FT.						
Ash	150	270	160	310	150	270
Basswood	120	260	130	240	110	230
Beech	80	180	75	200	70	180
Cottonwood	70	160	60	160	60	170
Sweet Gum	80	170	75	180	70	180
Elm & Hackberry	70	180	75	190	70	180
Hickory	100	210	120	210	110	230
Soft Maple	100	210	120	240	130	240
Sugar Maple	170	350	210	350	200	400
Black Oak	150	290	170	290	150	280
Pin Oak	80	180	85	190	80	190
Red Oak	220	350	250	370	260	430
White Oak	210	350	240	400	240	400
Yellow Poplar	130	280	150	280	140	280
Sycamore	70	180	75	190	65	180
Black Walnut	300	500	390	520	370	590
Woods Run Bottomland	95	200	110	210	100	200
Woods Run Upland	170	250	180	260	180	310
FACE VENEER - $ PER M BD. FT.						
Red Oak	530	900	630	1,000	540	1,020
White Oak	1,050	1,630	980	1,600	1,020	1,410
Walnut	1,540	2,460	1,720	1,980	1,660	2,780
COOPERAGE - $ PER M BD. FT.						
White Oak	300	570	260	470	260	430
UNPEELED PULPWOOD - $ PER TON						
Ton	3.30	21.80	3.60	18.20	3.30	19.00

MOST COMMONLY REPORTED PRICES PAID ILLINOIS TIMBER PRODUCERS
November 2000 - February 2001

PRODUCT	UNIT	Zone 1		Zone 2		Zone 3	
		Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
				Dollars			
1. Sawtimber							
Ash	M bd. ft.	100-200	200-300	100-260	170-400	80-250	250-310
Basswood	M bd. ft.	N/A	N/A	60-160	190-300	50-200	200-300
Beech	M bd. ft.	50-100	150-200	40-80	180-200	20-100	150-200
Cottonwood	M bd. ft.	50-100	150-200	35-100	80-200	30-80	150-180
Sweet Gum	M bd. ft.	50-100	150-200	45-120	160-200	N/A	150-200
Elm & Hackberry	M bd. ft.	50-100	N/A	40-120	160-250	45-100	150-200
Hickory	M bd. ft.	50-200	200-350	40-220	170-300	50-200	230-250
Soft Maple	M bd. ft.	50-150	N/A	50-250	160-350	65-250	275-315
Sugar Maple	M bd. ft.	100-300	200-500	40-260	300-700	65-350	325-500
Black Oak	M bd. ft.	100-250	200-450	25-310	40-500	20-250	250-300
Pin Oak	M bd. ft.	50-100	150-200	40-130	100-250	50-150	150-275
Red Oak	M bd. ft.	150-350	300-650	85-400	160-500	125-450	350-600
White Oak	M bd. ft.	150-500	300-600	50-400	160-500	100-450	325-500
Yellow Poplar	M bd. ft.	100-250	200-300	70-200	300-400	50-250	N/A
Sycamore	M bd. ft.	50-100	125-200	35-120	150-200	20-80	150-200
Black Walnut	M bd. ft.	100-750	N/A	190-500	200-700	75-500	500-1,100
Woods Run Bottomland	M bd. ft.	70-200	150-250	60-150	160-250	80-200	N/A
Woods Run Upland	M bd. ft.	100-350	200-400	60-300	160-500	150-400	325-450
		STATEWIDE					
		Stumpage				F.O.B. Mill	
2. Face Veneer							
Red Oak	M bd. ft.	150-1,000				300-1,570	
White Oak	M bd. ft.	500-1,500				500-2,270	
Walnut	M bd. ft.	400-2,500				600-4,680	
3. Cooperage							
White Oak	M bd. ft.	100-400				300-500	
4. Pulpwood							
Unpeeled	M bd. ft.	3.00-4.00				18.00-20.00	

LOG SCALES USED BY REPORTING BUYERS

Scale	Percent Using
Doyle	99
Scribner	1
International	-

CUSTOM SAWING BY THOSE REPORTING

Region	Percent Reporting	Rated Reported $/M bd. ft.
Zone 1	36	15-200
Zone 2	23	100-300
Zone 3	8	200-250
Illinois	20	15-300

VOLUME OF 1999-2000 OPERATIONS

Size in (000) bd. ft.	Zone 1	Zone 2	Zone 3	All
	%	%	%	%
1 - 100	39	21	23	25
100 - 500	23	17	32	24
500 - 1,000	23	21	9	17
1,000 - 3,000	15	25	14	19
3,000 +	-	16	22	15

Cooperage is the manufacture of barrels. Face veneer is logs cut into thin sheets or "veneer" used mostly by furniture builders. Pulpwood is used in making paper, fiberboard, and similar products. M bd. ft. means thousand board feet. Sawtimber refers to logs that are cut into lumber or timbers. F.O.B. refers to the price paid for timber delivered to the mill.

Brad Schwab, State Statistician

Jerry Burney, Rick Kestle, Agricultural Statisticians

"Printed by authority of the State of Illinois, "9/11/01, 1,700, 3405

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UNIVERSITY OF ILLINOIS EXTENSION

ILLINOIS FOREST MANAGEMENT

A Biannual Newsletter for Illinois Landowners

Volume 2, 2001 No. 41

IN THIS ISSUE

Illinois Forest Management Newsletter is produced by the University of Illinois Department of Natural Resources and Environmental Sciences and University of Illinois Extension. Our newsletter features information from many sources to help you make informed decisions concerning your woodland resources. We encourage your questions and comments which we will share with our readers as space permits. Direct your inquiries to: Editor, IFM Newsletter, W-503 Turner Hall, 1102 S. Goodwin Ave., Urbana, IL 61801.

In this issue of *Illinois Forest Management Newsletter*, we will continue our new series entitled **"Coming to a Woodland Near You"** which deals with exotic-invasive species that are impacting our woodlands in Illinois. The article focuses on a specific species and will help you identify it, understand its life history and its impact on your woodland, and how you can attempt to control it.

Coming to a Woodland Near You

— Exotic Species & How to Deal with Them —

Multiflora Rose

DESCRIPTION

A member of the rose family, multiflora rose is a dense spreading shrub with wide, arching canes and stiff curved thorns. Older plants may have a root crown diameter of 8 inches or more and can reach a height of 15 feet. Its pinnately compound leaves grow alternately and usually consist of seven to nine small (1/2 to 1 inch) oval leaflets with toothed margins. The leaflets are nearly smooth on the upper surface and paler with short hairs on the underside. Blossoming in late spring, its numerous white flowers form a panicle from 1/2 to 11/2 inches across. Native roses usually have pink flowers. The flowers develop into small, hard, nearly round red fruits (called hips) that are 1/4 inch in size. They remain on the plant throughout the winter. The seeds are angular achenes.

DISTRIBUTION AND HABITAT

Multiflora rose was introduced to the East Coast from Japan in 1866 as rootstock for ornamental roses. Beginning in the 1930s, the U.S. Soil Conservation Service promoted it for use in erosion control and as "living fences" to confine livestock. State conservation

departments soon discovered value in multiflora rose as wildlife cover for pheasant, bobwhite quail, and cottontail rabbit and as food for songbirds and encouraged its use by distributing rooted cuttings to landowners free of charge. More recently, multiflora rose has been planted in highway median strips to serve as crash barriers and to reduce automobile headlight glare. Its tenacious and unstoppable growth habit was eventually recognized as a problem on pastures and unplowed lands, where it disrupted cattle grazing. For these reasons, multiflora rose is classified as a noxious weed in several states.

Multiflora rose has naturalized in most of the northeastern and Midwestern United States. Presumably, its northern range is limited by an inability to tolerate winter temperatures below -28°F. The plant is found in old fields, pastures, roadsides and forests. It can live in a wide range of soil and environmental conditions, but thrives in sunny areas with well-drained soils. It is not found in standing water or extremely dry habitats.

LIFE HISTORY AND EFFECTS OF INVASION

Multiflora rose blooms in May or June. Individual plants may produce up to 500,000 seeds per year. The majority of seedlings emerge near the parent plant from which the seeds fell. In addition, many species of birds and mammals feed on the hips, dispersing the seeds widely. The canes are also capable of rooting when in contact with soil.

Multiflora rose readily invades prairies, savannas, open woodlands, and forest edges. Where it grows in dense thickets, it replaces the surrounding vegetation.

CONTROLLING MULTIFLORA ROSE

Mechanical Control

In areas where multiflora rose is just beginning to invade, fire can limit its establishment. Scattered populations in high-quality areas can be effectively controlled by complete removal of the plants. All roots must be removed because new plants can grow from severed roots. Mowing with heavy equipment
has proven effective, although non-selective. However, the strong thorns have been known to puncture rubber tires—filling tires with foam may help. Mowing or cutting should be repeated 3-6 times during the growing season for at least 2-4 years. Follow-up monitoring is necessary because new plants may arise from root fragments or previously dormant seeds.

Chemical Control

Manual application of herbicides on freshly cut stems has proven an effective means of control as it can destroy the root system and prevent re-sprouting. After the stem is cut, herbicide should be applied. Glyphosate (Roundup) can be used effectively as a 10% to 20 % active ingredient (a.i.) solution if applied to the cut stems or canes in the growing season (between July and September) or during dormancy. Application during dormancy is preferable because it reduces the likelihood of damaging other species. A foliar spray of 1% a.i. glyphosate solution applied to flowering or budding plants is also effective, especially when the flowers are in full bloom. However, it is non-selective and should not be used in high-quality natural areas.

Triclopyr formulated for water dilution can be applied to cut stems or canes with a hand-held sprayer. Triclopyr must be applied within a few hours of cutting. Dormant season is the best time for application to ensure non-target species are not damaged by run-off.

A foliar spray of 2% a.i. fosamine (Krenite-S) solution in water can be effectively used from July to September if the foliage is well covered. So not spray so heavily that herbicide drips off the target species. Die-back will not be apparent until the following summer. Fosamine is the preferred foliar spray treatment because it is non-volatile and will only affect woody species.

A 1% a.i. solution of dicamba (Banvel) can be applied as a foliar spray. Dicamba is selective against broadleaf plants and should never be used if desirable broadleaf vegetation is present. Application is most effective when administrating during May or June when plants have achieved full leaf-out and are actively flowering. When treating dense foliage, one-half ounce of surfactant should be added per gallon of water for maximum effectiveness.

Other herbicides that can be used to surpress and control multiflora rose include: 2,4-D LV Ester applied when plants are actively growing in the seedling stage; Picloram (Tordon), a restricted use product; Imazapyr (Arsenal); Tebuthiuron (Spike 20P) on pastures, rangeland and noncropland. This product may injure or kill desirable vegetation having roots extending into the treated area. Keep out of lakes, ponds and streams. There are grazing and haying limitations; Metsulfuron methyl (Escort) used at rate of 1/2 ounce per acre. Rate range is 1/3 to 3/4 ounce per acre.

A handful of water softener salt place at the base of the plant has apparently proven effective, but will remain in the soil for many years.

Biological Control

Biological methods exist to kill or damage multiflora rose. Rose rosette disease, a native virus vectored by a eriophyid mite (***Phyllocoptes frutiphilus***), can be fatal. However, it may infect native roses and plums as well as commercially important members of the rose family like apples, some berries, and ornamental roses. The disease spreads from infected canes to the roots and then to other canes. Plants usually die within 1-2 years. Pruning may be practical

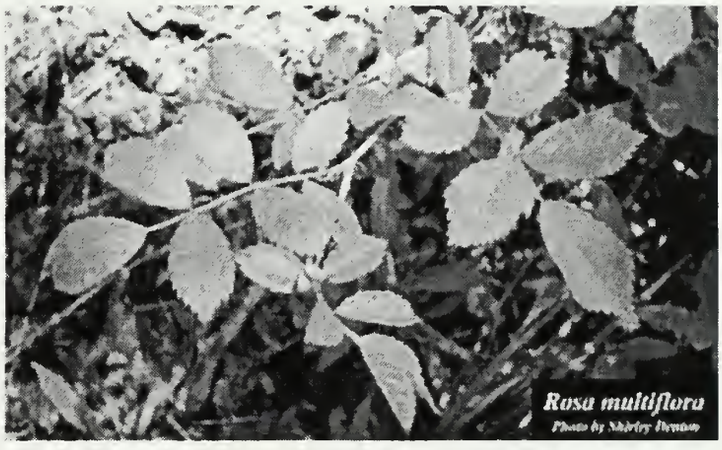
in areas where the disease is present because it encourages succulent growth, increasing plant susceptibility to mite infestation.

Two insects also feed on multiflora rose; the larva of the rose stem girdler beetle girdles and kills individual canes and the other, the rose seed chalid wasp (*Megastigmus aculeastus* var. *nigroflavus*) reduces seed viability. The U.S Department of Agriculture should be contacted for more information on biological control methods.

SOURCES:
http://www.angelfire.com/on2/EVS/multiflorarose.html
http://www.nps.gov/plants/alien/fact/romu1.htm

Illustrations: Missouri DOC & Virginia DCR

Flowers and Foliage: TNCWeeds, UC-Davis



Foliage: University of South Florida / Shirley Denton

Flowers: University of South Florida / Shirley Denton

Tax Tips for Forest Landowners for the 2001 Tax Year

by Larry M. Bishop, Forest Management and Taxation Specialist

Here is some information to keep in mind when you prepare your Federal income tax return for the 2001 tax year. This discussion is necessarily brief, and you should consult other sources for a more comprehensive treatment of the issues. This information is current as of December 1,2001 and supersedes Management Bulletin R8-MB 87.

Basis and Tax Records

Part of the price you receive from a timber sale is taxable income, but part is also your investment (i.e., basis)in the timber sold. Allocate your total costs of acquiring purchased forestland —or the value of inherited forestland —among land, timber, and other capital accounts as soon as possible. Adjust this basis up for new purchases or investments and down for sales or other disposals. When you sell your timber, you can take a depletion deduction equal to ((Adjusted basis ÷ Total timber volume just before the sale) x (Timber volume sold)). Good records include a written management plan and a map of your forestland. Keep records that support current deductions 6 years beyond the date the return is due. Keep records that support your basis 6 years beyond your period of ownership. Report basis and timber depletion on IRS Form T (Timber), Schedule B.

Passive Loss Rules

The passive loss rules are too complex to cover in detail here, but what follows is a very brief summary. Under the passive loss rules, you can be classified in one of three categories: (1) investor, (2) passive participant in a trade or business, or (3) active participant (materially participating) in a trade or business.

The law 's intent is that you are "materially participating " if your involvement is regular, continuous, and substantial; however, a low level of activity is adequate if that level is all that is required to sustain the trade or business. This means that record keeping is very important! To show material participation, landowners will need to keep records of all business transactions related to managing their timber stands. Likewise, it would be a good idea to keep records of other business-related activities such as landowner meetings attended, odometer readings to and from meetings, cancelled checks for registration fees, and copies of meeting agendas. Generally, you will get the best tax advantage if you are "materially participating " in a timber business because all management expenses, property taxes, and interest on indebtedness are fully deductible against income from any source. However, if you are "materially participating," you must dispose of your timber under the provisions of Section 631 to qualify for capital gains. (This means that you must sell your timber on a "pay-as-cut " or "cut and convert " basis, rather than lump sum.) If you have considerable passive income (such as annual rental payments), it may be to your advantage to be considered "passive." Most of the discussion that follows applies to forest landowners who are "materially participating."

Reforestation Tax Credit and Amortization

The reforestation tax credit and 7-year amortization is one of the best tax advantages for forest landowners. If you reforested during 2001, you can claim a 10-percent investment tax credit for the first $10,000 you spent for reforestation during the tax year. In addition, you can amortize (deduct) all of your 2001 reforestation costs (up to $10,000), minus half the tax credit taken, over the next 7 years (actually 8 tax years). The election to amortize must be made on a timely tax return for the year in which the reforestation expenses were incurred. Elect to amortize reforestation expenses on Form 4562. (Passive owners may or may not be eligible for the amortization and credit).

Here 's how it works. Assume you spent $4,000 to reforest a cutover tract in 2001.You claim a $400 tax credit (10 percent of $4,000) for 2001. You can also deduct 95 percent of these reforestation costs over the next 8 tax years. Due to a half-year convention you can only claim one-half of the annual amortizable portion for 2000.This means that on your 2000 tax return you can deduct one-half of (0.95 x $4,000 ÷ 7) or $271. For the next 6 tax years you can deduct (0.95 x $4,000 ÷ 7) or $543, and the remaining $271 can be deducted the 8th tax year.

The annual reforestation amortization is claimed on Form 1040 on the line for adjustments rather than being claimed on Schedule A under miscellaneous deductions. (If you use Schedule A for this purpose, you can claim only aggregated miscellaneous deductions that exceed 2 percent of adjusted gross income). Use Form 3468 to claim the investment tax credit.

Any reforestation costs exceeding the $10,000 annual limit should be capitalized (entered into your timber account). You can recover (deduct) these costs when you sell your timber.

A final word of caution: the tax credit and 7-year amortization deductions are subject to recapture if you dispose of your trees — within 5 years of planting for the credit and within 10 years of planting for the amortization.

Capital Gains and Self-employment Taxes

If you report your timber sale income as ordinary income, you could pay significantly more in taxes than you would if you report it as a capital gain. Also, capital gains are not subject to the self-employ-

ment tax, as is ordinary income. The net self-employment tax rate for 2001 is 15.3 percent for self-employment income of $400 or more. The rate consists of a 12.4 percent component for old age, survivors, and disability insurance (OASDI) and a 2.9-percent component for hospital insurance (Medicare). The maximum income subject to the OASDI component of the tax rate is $80,400, while the Medicare component is unlimited. However, if wages subject to Social Security or Railroad Retirement tax are received during the tax year, the maximum is reduced by the amount of wages on which these taxes were paid. To qualify for long-term capital gains treatment, timber sold after December 31,1997 must have been held longer than 12 months. The maximum long-term capital gains rate for timber sold in 2001 is 20%. (For taxpayers in the lowest income bracket, the maximum rate is 10%).

Cost-share Payments

If you received cost-share assistance under one or more of the Federal or State cost-share programs during 2001,you may have to report some or all of it as ordinary income. You have two options. You have the option to include it as income and then recover the part that you pay plus the cost-share payment through the amortization and reforestation tax credit already described. You also have the option to exclude the "excludable portion " from income if certain conditions are met. These conditions are (1) the cost-share program has to be approved for exclusion by the IRS and (2) the maximum amount excludable per acre is the greater of: (a) the present value of $2.50 per acre or (b) the present value of 10 percent of the average income per acre for the past 3 tax years. This second requirement gets rather complicated because you have to determine an appropriate interest rate to compute the present values. Programs approved for exclusion by the IRS include the Forestry Incentives Program (FIP), the Forest Stewardship Incentive Program (SIP), the Wetlands Reserve Program (WRP), the Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP), plus several State programs (check with your State Forestry Agency for approved programs in your State).

Generally, if you harvested the tract within the last 3 years, probably all of the cost-shares received can be excluded from income. In some cases, taxpayers may be better off to exclude cost-share payments. Other taxpayers may be better off not to exclude cost-share payments. Instead, they may be better off to claim the cost-share payments as part of the reforestation tax credit/7-year amortization. The important point here is you must report cost-share payments. If you decide to exclude, attach a statement to your return that states specifically what cost-share payments you received, that you choose to exclude some or all of them, and how you determined the excludable amount.

Conservation Reserve Program

If you planted trees during 2001 under the Conservation Reserve Program (CRP), you must report your annual payment as ordinary income. If you received CRP cost-share assistance funds for planting your trees, you must also report these as ordinary income. CRP cost-share payments used to establish trees can be claimed as part of the reforestation expenses reported for the reforestation tax credit/ 7-year amortization.

Farmers may treat expenditures for soil and water conservation on farmland as expenses in the year incurred , rather than capitalizing them (CRP expenditures qualify). However, the amount deductible in any year shall not exceed 25 percent of the gross income from farming.

Casualty Losses

A casualty loss must result from some event that is (1) identifiable, (2) damaging to property, and (3) sudden and unexpected or unusual in nature. Examples include wildfire and storms. Generally, your claim for casualty losses can be no more than the adjusted basis minus any insurance or other compensation.

The IRS has issued Revenue Rulings on southern pine beetle losses in timber stands, drought losses of planted seedlings, and casualty loss deductions. It ruled that beetle and drought losses generally do not qualify for a casualty loss deduction because they are not sudden. They may, however, qualify for a business-or investment-loss deduction. A 1999 Revenue Ruling permits use of the depletion block as the "single identifiable property damaged or destroyed" in calculating a casualty loss deduction.

Management and Maintenance Expenses

Generally, your annual expenses for the management and maintenance of an existing stand of timber can be expensed or capitalized. In most cases, you are better off to expense those costs during the tax year they are incurred, rather than capitalizing them. If it is not to your advantage to itemize deductions for 2001, you should capitalize these expenses. If you choose to itemize deductions, you can deduct these expenses, but the passive loss rules apply.

Conclusion

Congress provided these favorable tax advantages to stimulate increased productivity from the nation's privately owned forestlands. When you take advantage of these favorable provisions you avoid paying unnecessary income taxes, and you earn more income from your woodland operations.

Reference

Haney, H.L., Jr.; Hoover, W.L.; Siegel, W.C.; and Greene, John L. 2001. Forest Landowners Guide to the Federal Income Tax. Ag Handbook 718. Washington, DC: U.S. Department of Agriculture.157 pp.

(The above handbook is available for sale from the U.S. Government Bookstore at 404-347-1900.The price is $20.00 per copy. Major credit cards are accepted.)

Tax Information on the Internet

USDA Forest Service publications are available at:
www.fs.fed.us/spf/coop

IRS publications and forms are available at: **www.irs.gov**

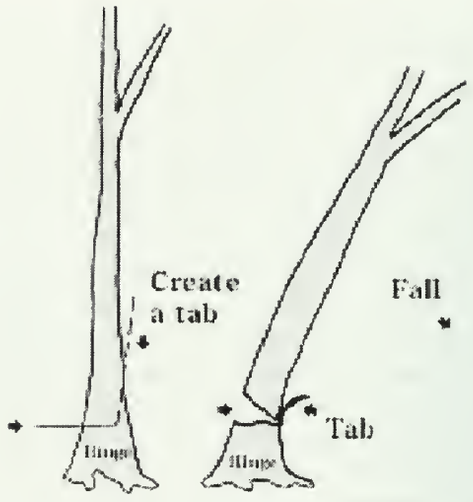
National Timber Tax Site is located at: **www.timbertax.org**

The following article is a continuation in the series of **Tim's Tips** articles reprinted from the logger training manual developed by Mike Bolin, Extension Forester and Tim Ard, president of Forest Applications Training, Inc. for the ***Illinois Pro Logger Training Program***. The chain saw safety and timber felling information is useful for landowners who own and use a chain saw on their property.

Small Tree Felling

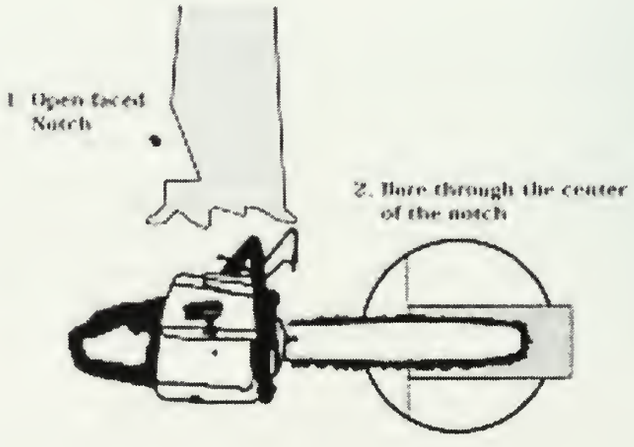
Loggers often assume that small trees are not worth the extra effort for directional felling. However, a small merchanable tree that falls the wrong way, or hangs up, can be very costly to pull down with a skidder. Even small brushy trees that are cleared as part of housekeeping chores around the base of the tree or for an escape route can, if felled the wrong way, create additional production problems. For example, a small sapling which is being removed from the base of one tree can fall into the next tree requiring the logger to cut the tree a second time when doing housekeeping around that second tree. Therefore, extra seconds taken to directionally fell a small sapling can save time later.

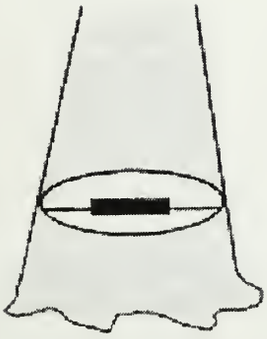
Directionally Felling Saplings - It is difficult to put a regular notch in a small sapling as it is easy to cut right through the tree. Creating a tab by making a downward cut through the last few years of growth will make an acceptable notch. A back cut, leaving a hinge, will cause this tree to fall in the direction of the initial undercut. It is important for the logger to use the Sight Line on the saw to make sure this sapling falls in the intended direction.



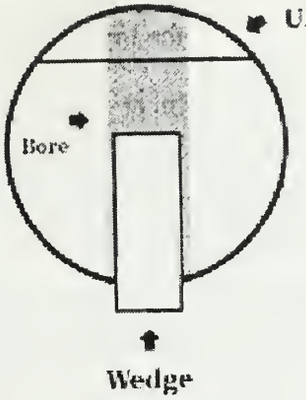
Felling Small Merchanable Trees - Small merchanable trees with back lean can be easily felled using a wedge. The process is as follows:

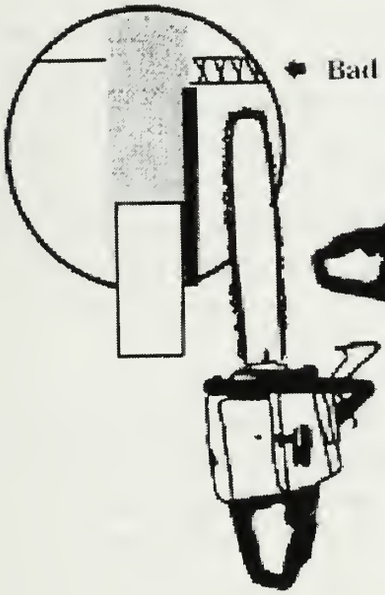
1. Make an open face notch.
2. Bore through the center of the undercut straight through to the back of the tree.
3. Widen the opening of the bore cut in the area where the hinge will be formed.
4. Drive a wedge into the tree from the back side and snug the wedge.
5. Using the attack corner of the saw on the bad side, make a cut about 1/2 inch below the wedge so that a hinge is formed. Cut just past the wedge: care must be taken not to cut the supporting wood under the wedge.
6. Repeat the process on the good side.
7. Drive the wedge through the tree. Remaining fiber should split allowing the tree to fall in the intended direction.



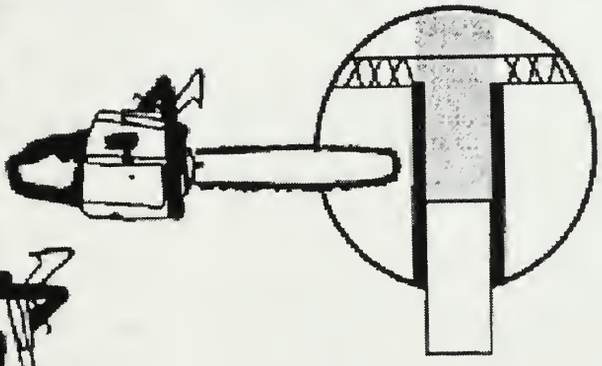


4. Drive a wedge into tree from backside

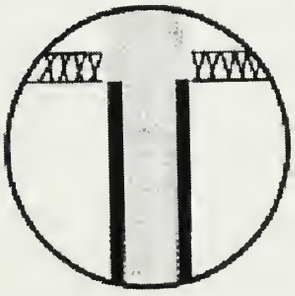




6. Repeat process on good side



7. Drive the wedge through the tree



Trees and Drought: the ABC's of Watering Trees

The following article is a compilation of information from various sources on watering trees, particularly in times of drought stress. These sources include information from "Watering Trees", "Drought Damage to Trees", *and* "Tree Selection for Drought Resistance" *by Dr. Kim Coder, Warnell School of Forest Resources at the University of Georgia, and* "Mulching to Conserve Moisture" *by Sandra Mason, University of Illinois Extension.*

Water is the most limiting ecological resource for most tree and forest sites. As soil-water content declines, trees become more stressed and begin to react to resource availability changes. A point is reached when water is so inadequately available that tree tissues and processes are damaged. Lack of water eventually leads to catastrophic biological failures and death.

Growing periods with little water can lead to decreased rates of diameter and height growth, poor resistance to other stresses, disruption of food production and distribution, and changes to the timing and rate of physiological processes, like fruit production and dormancy. More than eighty percent (80%) of the variation in tree growth is because of water supply. Effects of drought can be recognized throughout a tree. The term "drought" denotes a period without precipitation, during which the water content of the soil is reduced to such an extent that trees can no longer extract sufficient water for normal life processes.

Trees constantly lose water to the atmosphere. Water is the single most limiting essential resource for tree survival and growth. Water shortages severely damage young and old trees alike, and set-up healthy trees for other problems. Drought conditions can lead to tree decline, pest problems, and non-recoverable damage. Supplemental watering can greatly assist in maintaining tree health during droughts—both during the growing season or during the dormant season.

Trees can be old and valuable. They are usually considered non-replaceable beyond 10 inches in diameter. Many associated landscape plants are low cost and easily replaceable. If these plants are damaged or lost to drought, the landscape can be corrected quickly and relatively cheaply. Large, drought-killed trees can not be replaced in two human generations. Watering trees is critically important, especially during periods of drought.

Visible Signs of Drought Stress

In deciduous trees, curling, bending, rolling, mottling, marginal browning (scorching,) chlorosis, shedding, and early autumn coloration of leaves are well-known responses to drought. In conifers (evergreens), drought may cause yellowing and browning of needle tips.

As drought intensifies, its harmful effects may be expressed in dieback of twigs and branches in tree crowns. Leaves in the top-most branch ends generate the lowest water potentials, and decline and die. Drought effects on roots cause inhibition of elongation, branching, and cambial growth. Drought affects root / soil contact (the root drys and contracts) and mechanically changes tree wind-firmness. Drought also minimizes stem growth.

How to Water

Ideally, irrigation should automatically begin when soil moisture reaches some critical measure determined by a moisture probe or soil tensiometers. Trees should be zoned apart from turf and other landscape plants. Careful tuning of irrigation systems are needed to prevent over-watering trees.

Manually, the best ways to water trees are by soaker hose or trickle (drip) irrigation, which you turn on and off. Sprinklers are less efficient for applying water to trees than soaker hoses or drip irrigation, but are easy to use. Even a garden hose, moved often, can provide a good soil soaking. Use a light organic mulch to conserve moisture and apply water over the top of the mulch. Do not concentrate water at the base of the trunk as this can lead to pest problems.

Deep watering a tree with a pipe or wand stuck into the soil 12-24 inches is not as good for trees as surface applications. Most of the tree's absorbing roots are in the top 12-

18 inches of soil. The annual root system (absorbing roots) take up a majority of the water in a tree. Annual roots are not the woody roots seen when a tree is dug. Large woody roots have bark. Any bark crack or damage is quickly sealed-off so little water flows through these areas. The young roots are the major absorbers of water and essential elements in a tree, but they are also the roots most easily damaged by drought. Applying water deeper than the annual root zone (upper 12-18 inches) misses the active roots and allows water to drain away from the roots, wasting efforts and water. Apply water across the soil surface and let it soak into the soil. Surface soaking allows tree roots more chances to absorb any water, helps maintain soil health, and helps maintain essential element cycling and transformations in the soil.

Where to Apply Water

Lay out water hoses or applicators out underneath the tree's crown to the furthest reaches of its branches, commonly called the "drip line". Generally speaking, two-thirds (2/3) of the tree's root system will be found within the zone defined by the drip line. The remaining one-third of the tree's root system extends beyond this zone. Concentrate watering in the soil areas that are directly beneath the foliage and shaded by the tree. Do not water beyond the drip line and do not water closer than 3 feet to the base of the trunk base on established trees. Be sure the water soaks in well. Use mulch and slow application rates on slopes, heavy soils (clays), and compacted soils to assure water is soaking in and not running off. If the tree is surrounded with other landscape plants, or by turf, deep soaking water applications will benefit all. Do not spray the tree's foliage when applying water. Water droplets on tree leaves can lead to pest problems and destruction of leaf tissue through sun damage. Try not to wet the trunk if possible.

Young, newly planted trees need additional watering care. There is little sideways movement of water in soil. You must apply water directly over where you need water in a soil. For new trees, concentrate water over the root ball, as well as the planting area, to assure survival.

Old, large trees can be extensively watered over the entire area under their drip line. Another method in watering large trees is to select roughly 1/3 of the area within the drip line for concentrated water applications. The whole area below the foliage can be watered occasionally.

When to Apply Water

The best time to water is at night from 10 pm to 8 am. Trees relieve water deficits (refill) over the nighttime hours. Watering at night allows effective use of applied water and less evaporative loss, assuring more water moves into the soil and tree. Nighttime application hours, when dew is already present, does not expand the foliage wetting period for understory plants. This watering cycle minimizes pest problems.

Drought predisposes trees to pests because of lower food reserves, poorer response to pest attack, and poorer adjustment to pest damage. Unhealthy trees are more prone to pest problems. Drought creates unhealthy trees. Attacks on trees by boring insects that live in the inner bark and outer wood can be more severe in dry years than in years when little water stress develops. Little water and elevated temperatures can also damage pest populations.

Supplemental watering of trees can be timed to help trees recover water and minimize pest problems on surrounding plants. Watering from dusk to dawn does not increase the normal wet period on plant surfaces since dew usually forms around dusk. Watering during the normal wet period will not change pest/host dynamics. Watering that extends the wet period into the morning or begins the wet period earlier in the evening can initiate many pest problems.

The next best time to water is late afternoons when foliage is dry and evaporation potential is not at its daily peak. Be sure to allow applied water to dry off of leaf surfaces before the evening dew appears. This dry gap between watering and atmospheric condensation helps minimize pests problems, which can become a problem with longer wetting periods. This is especially critical where turf surrounds a tree.

Because trees lose water from day to day, month to month,

and season to season, dormant season watering during winter drought is important, especially for evergreen trees and juvenile hardwood trees that have not lost their leaves. Because of temperature and relative humidity interactions, much less water is required in the dormant season, but water is still needed. Do not water when the soil surface is less than 40°F.

For every 18°F increase in temperature, the amount of water lost by a tree and the site around it almost doubles. This feature of water loss must be factored into applying supplemental water to a tree. Trees surrounded by pavement and other hot, hard surfaces can be 20-30°F warmer than a tree in a protected, landscaped backyard. Water use rapidly climbs with increasing temperatures and so should water application volumes.

How Much to Apply

Depending upon soil texture, bulk density, daily temperatures, and rainfall amounts, 1-3 inches of water per week should keep a tree healthy. Trees in limited rooting areas, in containers or pots, or on major slopes, need additional care to assure water is reaching the root system in adequate amounts and not suffocating roots from lack of drainage. Five gallons of water applied to a square yard (3 feet by 3 feet) of soil surface area is equal to about 1 inch of water. An easy way to determine when you have applied an inch of water to the soil surface is to set a pie plate or bowl down on the ground in the area you are watering. When the container fills with water to a depth of 1-2 inches, move the hose and the emptied container to a new location and continue watering.

Fine soils (clays) require careful attention to prevent overwatering and root death. Sandy soils can be very droughty because water runs out of the rooting zone quickly. There are some water-holding compounds that are commercially available for keeping water near roots. Composted organic material additions and organic mulch covers on the soil surface can help hold and prevent rapid loss of applied water.

Mulches are any materials used on the surface of the soil. This broad definition could include organic materials such as wood chips, pine needles, straw, peat moss, corncobs and lawn clippings. Inorganic mulches would include river rock, ground tires, volcanic rock and synthetic fabrics.

Generally organic mulches are preferred for plant growth because of their ability to improve soil structure and provide a more natural environment for good root growth, and, therefore, good top growth of the plant. Benefits of organic mulches include:

☐ Conserving soil moisture. Mulches can also increase water penetration into the soil.

☐ Maintaining a uniform soil temperature by insulating the soil. Mulches keep the soil warmer during cool weather and cooler during warm weather.

☐ Minimizing soil erosion and compaction from heavy rains, heavy equipment such as lawn mowers, and heavy use in high foot-traffic areas.

☐ Improving soil structure through the decomposition of organic mulches. This is particularly important in heavy (clay) soil types. Mulches keep clay soil from cracking after rains. Mulches encourage worm activity and other beneficial life in the soil.

☐ Reducing weed problems by preventing weed seed germination.

☐ Keeping lawn mowers and string trimmers away from tree trunks and surface roots. Few things will bring a horticulturist or tree care professional to tears faster than to see tree trunk damage due to lawn mower blight. Once a tree is damaged from a lawn mower scrapping the trunk or a string trimmer bruising the trunk, little can be done to correct the damage.

Some disadvantages of organic mulches include:

☐ Induced nitrogen deficiency. As they decompose, fresh organic materials could cause nitrogen deficiency if fertilizer is not added regularly. Fresh mulch should be composted for at least three months before use.

☐ Aeration and water-logging problems. Fine textured mulches such as sawdust or grass clippings may retain too much moisture so should be applied in several thin layers or they should be used mixed with a coarser material. Over time, sawdust can also crust-over and cause water to run off rather than soak in.

Generally mulches such as pine needles and oak leaves will not cause dramatic changes in the acidity or alkalinity of the soil as is often believed.

Mulching recommendations:

☐ Apply composted material to the soil surface and "top off" the mulch with coarser, fresher material. Incorporation of the mulch into the soil is not recommended or necessary.

☐ Mulch should be about 4 inches deep and should not exceed 6 inches in depth. At minimum, it should cover the zone underneath the tree's drip line.

☐ Keep mulch at least 6 inches away from the tree's trunk and a couple inches away from plant stems to discourage insect and rodent problems.

How Often to Water

Trees should be watered once or twice a week in the growing season if there is no rainfall in that particular week. A few heavy (high volume) waterings are much better than many light, shallow waterings. A greater proportion of the applied water is utilized by the tree with heavy watering. Also, light waterings encourage shallow rooting which can lead to more severe drought damage. Once you begin watering you should continue to water until rain comes.

Other Things to Consider

Many plants in a small area can effectively compete within the soil to use available water. This water competition can be severe. Remove excess plant competition from around any tree to decrease water stress. Use mulch to conserve water and prevent weed competition. Careful applications of herbicides can also reduce weed competition for water, but severe drought conditions can lead to unexpected results. You should be very cautious about using any "weed and feed" fertilizer within the drip line of a tree. Weed and feed fertilizers contain herbicides that target broadleaf weeds in the yard—a deciduous tree is a broadleaf plant. While the herbicide in the weed and feed fertilizer may not kill the tree, the herbicide can put it under considerable stress. Add drought stress on top of this and serious problems could result.

When landscape watering is not allowed because of water-use restrictions, "gray water" could be used. Gray water is waste water from household bathtub, shower, sink, dishwasher, and/or washing machine. You should check to see if it is legal to use gray water in your county or city. Gray water will play a greater role in water conservation in the future. If you use a sodium-based water softening system, you should not apply this water to the soil.

Xeriscaping—the development of water-efficient landscapes—is becoming more important. There are a number of concepts involved in developing a water-efficient landscape and when integrated wisely, will conserve water while providing a functional and aesthetically pleasing landscape. Selecting trees for landscaping based on their ability to tolerate drought is an important part of any water-efficient landscape. The following list of trees identifies those species *(commonly found in Illinois)* that are drought-resistant:

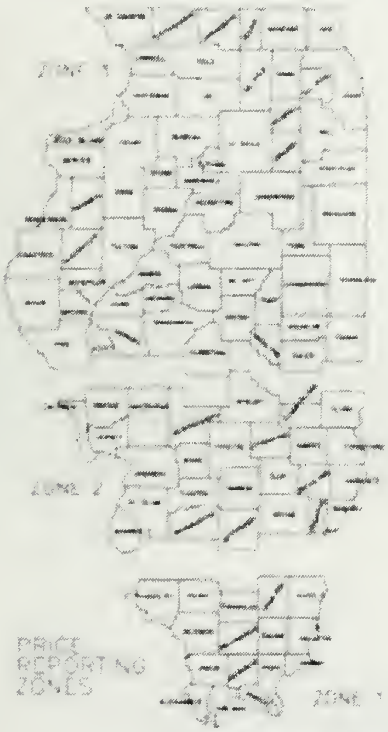
Maple	
Acer negundo	**boxelder**
Acer platanoides	**sycamore maple**
Acer rubrum	**red maple**
Acer saccharinum	**silver (soft) maple**
Ailanthus altissima	**tree-of-heaven**
Betula nigra	**river birch**
Hickory	
Carya glabra	**pignut hickory**
Carya ovata	**shagbark hickory**
Carya tomentosa	**mockernut hickory**

Catalpa bignonioides	catalpa
Celtis occidentalis	hackberry
Cercis canadensis	redbud
Crataegus spp.	hawthorn
Diospyros virginiana	persimmon
Elaeagnus spp.	olive
Fraxinus pennsylvanica	green ash
Ginkgo biloba	ginkgo
Gleditsia triacanthos	honeylocust
Gymnocladus dioicus	Kentucky coffee tree
Juglans nigra	black walnut
Juniperus spp.	juniper
Maclura pomifera	osage orange
Morus spp.	mulberry
Nyssa spp.	tupelo
Ostrya virginiana	ironwood
Pines	
Pinus echinata	shortleaf pine
Pinus sylvestris	Scots (Scotch) pine
Pinus taeda	loblolly pine
Platanus spp.	sycamores
Populus alba	white poplar
Populus deltoides	cottonwood
Oaks	
Quercus coccinea	scarlet oak
Quercus imbricaria	shingle oak
Quercus macrocarpa	bur oak
Quercus marilandica	blackjack oak
Quercus muehlenbergi	chinkapin oak
Quercus prinus	chestnut oak
Quercus shumardii	Shumard oak
Quercus stellata	post oak
Quercus velutina	black oak
Robinia pseudoacacia	black locust
Salix nigra	black willow
Sassafras albidum	sassafras
Elms	
Ulmus americana	American elm
Ulmus parvifolia	Chinese elm
Ulmus pumila	Siberian elm

For more detailed information on how trees react to and deal with drought situations, refer to the publication entitled "Drought Damage to Trees" *by Dr. Kim Coder. This publication is available on the Internet from this web site address:*

http://www.gaipm.org/forest/drought/droughtdamage.html

ILLINOIS TIMBER PRICES



PRICES PAID ILLINOIS TIMBER PRODUCERS
MAY 2000 THROUGH AUGUST 2001

This report is prepared by the Illinois Agricultural Statistics Service in cooperation with the Illinois Division of Forest Resources. Unless otherwise indicated, prices shown in this report are prices reported by Illinois timber buyers. The cooperation of those timber buyers who participated in the survey is greatly appreciated.

Illinois is divided into three price reporting zones based on timber types, utilization standards and practices, and soil types. Zone 1 is the Northern Unit, Zone 2 the Claypan Unit, and Zone 3 the Prairie Unit. Ranges of prices for each zone are shown on the back of this report. Of the timber buyers reporting volume of their 2001 operations, [illegible] indicated their volume was [illegible] thousand board feet or more.

This report can be used only as a general guide for determining market value of timber. General market and economic conditions are the major price determining factors. Contractual considerations such as accessibility, size and terrain, distance to logging, size of sale and tree size and quality also affect the price paid. For technical, marketing or management assistance, contact your local State Forester or the Division of Forest Resources, Illinois Department of Natural Resources, 600 North Grand Avenue West, Springfield, Illinois 62706.

AVERAGE PRICES FOR STUMPAGE AND F.O.B. IN SELECTED PERIODS
SAWTIMBER - $ PER M BD FT

SPECIES	May 2000 - August 2000		November 2000 - February 2001		May 2001 - August 2001	
	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill	Stumpage	F.O.B. Mill
Ash	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Basswood	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Beech	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cottonwood	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sweetgum	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Elm & Hackberry	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hickory	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Soft Maple	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sugar Maple	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Black Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pin Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Red Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Yellow Poplar	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sycamore	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Black Walnut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

FACE VENEER - $ PER M BD FT

Red Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
White Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Walnut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

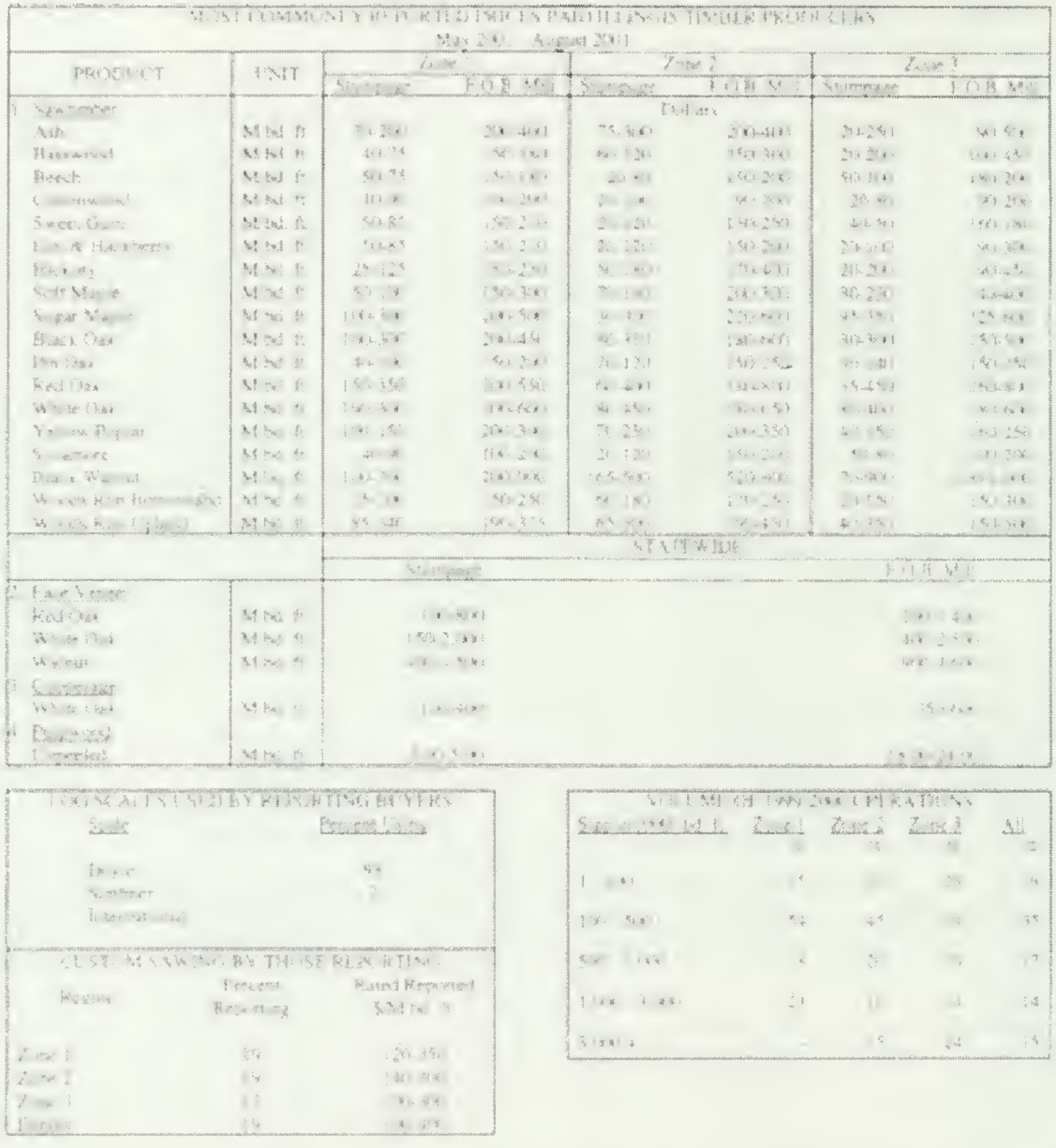
COOPERAGE - $ PER M BD FT

White Oak	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

UNPEELED PULPWOOD - $ PER TON

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

OVER



Illinois Forest Management Newsletter **http://www.nres.uiuc.edu/outreach/pubs/ifmn.html**