AGRICULTURAL EXTENSION SERVICE
THE UNIVERSITY OF TENNESSEE

Forestry, Wildlife & Fisheries Update Newsletter

Department of Forestry, Wildlife and Fisheries *July 2002*
George Hopper - Professor and Head *Website: http://fwf.ag.utk.edu*

In This Issue:

Calendar of Events - 2002

July 22 -23
4-H Roundup, Martin - See you there!

July 24-25
Milan Field Day

August 7
Inservice Training for Establishing & Managing Native Warm Season Grasses for Wildlife - Smoky Mountain District
Location: NRCS Office, Kingston, Tennessee **Time: 9:00 a.m.**

August 8
Inservice Training for Establishing & Managing Native Warm Season Grasses for Wildlife - Central District
Location: Middle Tennessee Experiment Station **Time: 9:00 a.m.**

* *Agents from the Western & Cumberland Districts are welcome to attend either session.*

Faculty:

Brian Bond, Forest Products
Wayne Clatterbuck, Forest Management
Craig Harper, Wildlife Management
Thomas Hill, Fisheries Management
George Hopper, Natural Resources
David Mercker, Forest Management
Larry Tankersley, Forest Management

Attention Extension Agents Responsible for Wildlife and Forestry Programs

Craig Harper, Assistant Professor, Wildlife Management
Larry Tankersley, Extension Assistant, Forest Management

Please consider hosting a wildlife management short course this winter (seven Tuesdays starting Feb. 4 and ending on the evening of March 18. The short course **requires** satellite links as the sessions will be originating from Clemson.

Many of you recall the "Master Tree Farmer" short courses offered by Wayne Clatterbuck over the past couple of years. This is the same format and logistics with a Wildlife Management curriculum. Master Tree Farmer received rave reviews from participants.

A fair amount of commitment on the part of you and yours will be **required** as you know seven consecutive Tuesdays can be time consuming and difficult.

We need to make a decision on this project by July 31st. Let us know what you think. More information is available on request. We hate to let this opportunity pass.

Thanks for your consideration and support.

Larry and Craig

For more information contact: *Craig Harper at (865) 974-7346*
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# # #

Oxygen in Ponds

Tom Hill, Professor, Fisheries Management

It's that time of year again. Phone calls with concerns about either stressed or dead fish have become plentiful lately. Here is some information to help you understand some of the dynamics of oxygen or lack of it in ponds, in order to try and avoid some problems.

How do you recognize oxygen depletion? First of all, you should observe the pond immediately before daylight. Fish will be seen on the surface gulping for oxygen. If disturbed by a loud noise, they dive but immediately return to the surface. If the oxygen content is not low enough to kill fish, fish at the surface in early morning will return to deeper water as the oxygen builds up during the day through photosynthesis. In fed ponds, fish often give warning signs of low oxygen by not eating. Oxygen levels lower than 3 ppm in the upper 2 feet should cause concern. Many fish will die if oxygen content is below 0.5 ppm for very long.

Oxygen in ponds comes from two sources – photosynthesis and diffusion from the air. The most important source is photosynthesis, which is the process plants use for manufacturing food. In the presence of sunlight, plants (especially algae) add oxygen to water as a by-product of photosynthesis. At night, no oxygen is

produced, but respiration of algae, fish, bacteria and other pond dwellers continue to remove oxygen from the water. Most of the time there is a desirable balance between how much oxygen is produced and how much is

used. However, under some conditions the balance can be upset, and the oxygen concentration becomes low enough to stress or kill fish.

The most common oxygen problem occurs when consumption by respiration exceeds the amount of oxygen produced through photosynthesis and diffusion from the air. Algae grow in large quantities as a result of heavy fish feeding. As the quantity of algae increases, it accumulates closer and closer to the surface to gather sunlight and increasingly shades the lower depths. As a result, most of the oxygen is produced near the surface, leaving a large volume of water below the first 2 to 4 feet deficient in oxygen production. Eventually, oxygen produced during the day is less than the demand for oxygen during the night, resulting in possible death or undesirable stress on fish. This situation may be especially acute after several consecutive cloudy days.

If you have experienced excessive filamentous algae growth in your pond this year, consider fertilizing earlier next year. A good plankton bloom established and maintained can shade the pond bottom and prevent growth of unwanted filamentous algae. Stock 15 Chinese grass carp per acre in your pond as well. They can be a tremendous help in keeping algae and aquatic weeds reduced in ponds. *(See article, "Grass Carp for Weed Control" in May 2002 Update Newsletter).*

Another type of oxygen depletion occurs when algae die suddenly. When algae die, not only does the pond lose it source of oxygen, but the decaying algae use considerable amounts of oxygen. All causes of sudden algae die-offs are not fully understood, but it is known that die-offs can occur after pond treatments with certain chemicals and herbicides.

Predicting natural algae die-offs is difficult. However, they are often associated with surface algae scums and very heavy algal "blooms". When a die-off occurs, the green water often becomes streaked with gray, black or brown. The color of the water may eventually become totally brown, gray, black, milky or clear. A distinct foul smell may also be noticeable.

The third and most serious kind of oxygen depletion is referred to as a "turn-over". During hot summer weather, surface water becomes less dense as it absorbs heat and it floats over a cooler, more dense layer of water. All the oxygen is produced in the warmer layer and the two layers may not mix for weeks at a time, especially in deep-water ponds. Eventually, all the oxygen is used up in the lower, cooler layer. A cool snap or a thunderstorm with wind and hard rain can cool the warm surface water, making it heavy enough to sink and mix with the oxygen-deficient bottom layer. The net result is a dilution of the oxygen and an increase in the demand for oxygen from dissolved minerals and decaying organic matter. To complicate these problems, the algae usually die at the same time. "Turn-overs" cause the most catastrophic fish kills in ponds of any oxygen-related problems.

What should be done if signs of oxygen depletion are observed? Immediate action must be taken. Stop feeding until good water quality is restored. Flush the pond with fresh aerated water from a well or another pond. If an irrigation pump is available, pump water from the upper 2 feet, aim the exhaust parallel to the bank and establish a circular motion around the pond. Back a tractor-powered rotary grass cutter into the pond and stir the water with the blades. A boat motor can help in a small pond. Add 6 to 8 pounds each of potassium permanganate and superphosphate per acre. The potassium permanganate helps reduce some of the organic matter and the superphosphate will stimulate the growth of planktonic algae in the water.

After the emergency has passed, the pond management program should be reviewed and the cause of the oxygen depletion eliminated. Prevention of such situations through proper management is the only permanent solution.

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# # #

Site Sensitivity of Native Forest Trees
David Mercker, Associate Extension Forester, Forest Management

If one considers a continuum of forest site productivity based on soil moisture, most forest trees will prefer to grow on mesic sites (as opposed to hydric or xeric). Mesic forest sites are characterized by intermediate moisture conditions, i.e. neither decidedly wet nor dry. Moisture conditions can vary considerably by moving short distances or by traveling from one side of a slope to another. Mesic sites are common throughout most of Tennessee, the exceptions being the wetlands located to the west, and the drier, shallow soils in the Nashville basin and its surrounding highland rim.

It is commonly believed, because of their prevalence on these sites, that certain species of trees prefer sites with moisture extremes . For instance, Red cedar and Post oak dominate on xeric (dry) sites while Bald cypress and Tupelo prevail on hydric (wet) sites. To the contrary, these species actually exist on extreme sites *not* because that's where they prefer to grow, but because that's where they can out-compete others. In most cases, trees found on extreme moisture sites actually prefer mesic sites and would reach their best growth potential on mesic sites. Unfortunately, that's where they're often out-competed by other tree species

Adaptations, both physiological and morphological, allow certain species to endure harsh site conditions. For instance, trees capable of enduring xeric sites often have: smaller leaves, leaves with thicker waxy cuticle, the ability to rapidly close leaf stomas (pores), root systems that can penetrate deeply, and flat-like crowns. These characteristics help to either conserve moisture or to seek new sources of it. In contrast, trees capable of surviving on hydric sites, do so by enduring prolonged periods of low soil oxygen (anaerobic condition). Bald cypress trees often produce pneumatophores (outgrowths from submerged roots, also called Cypress knees) to aid the roots in obtaining oxygen.

Understanding site sensitivities is vital whether managing an existing forest or planning for the creation of a new one. Mastery of each species'site requirements and its ability to out- perform the competition is important. As a general rule, pines are less site sensitive than are hardwoods. Called "plastic", the range of pine on the moisture gradient is generally broad. In addition, it is normally easier to move wet site species to dry sites than dry to wet.

For homeowners trying to establish trees in yard settings, close examination of the site (particularly soil moisture) will help determine which tree(s) are better adapted to survive. The UT Agricultural Extension Service can assist in matching the tree to the site.

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# # #

Oak Species Are Not the Same:
Match the Species to the Site When Planting Oak in Conservation Plantings
Wayne Clatterbuck, Associate Professor, Forest Management

The term "oak" is often used generically, without recognizing the different oak species, each species' growth habits and the sites that they occur. Oak is actually a genera within the beech family (Fagaceae) composed of 60 to 70 species in North America. More than 20 oak species occur in Tennessee. Planting failures

occur when one species of oak is planted on a range of sites. Outlined below are a few characteristics that must be considered when planting oak on bottomland sites.

Common and Scientific Name	**Cherrybark oak** *(Quercus falcata var. pagodifolia or Quercus pagoda)*
Occurrence in Bottomlands:	Widely on best loamy sites on all river bottom ridges and better-drained terraces. Mostly on older alluvium. Occasionally found on tight, silty clay, but grows poorly there.
Shade Tolerance:	Moderately intolerant.
Flood Tolerance:	Weakly tolerant to intolerant. Seedlings can withstand little flooding. Viability of acorns greatly reduced by submergence. Cherrybark oak will not tolerate flooding during the growing season, especially during budbreak.
Reproductive Characteristics:	Seed dispersed from Sept. to Dec. by gravity, birds and animals --- seldom by water. Seedlings may start in the shade, but cannot survive long. Not a good stump sprouter.

Common and Scientific Name:	**Nuttall oak** (*Quercus nuttalli*)
Occurrence in Bottomlands:	Widely on flats, low ridges, shallow sloughs, and near margins of swamps in recent alluvial sites. On older alluvium mainly restricted to wet, heavy, but not impervious sites. Restricted to major streams entering the Gulf and their tributaries. Considered the "generalist" of bottomland oaks as will prosper in poorly- drained to well-drained sites as long as soils are not inundated with water.
Shade Tolerance:	Intolerant.
Flood Tolerance:	Moderately tolerant. Seedlings killed by high water during the growing season. Viability of acorns not reduced by 30 days of submergence.
Reproductive Characteristics:	Starts readily in either shade or opening but soon dies in prolonged shade. Persists against heavy ground cover. Many large trees are of sprout origin.

Common and Scientific Name:	**Shumard oak** ***(Quercus shumardii)***
Occurrence in Bottomlands:	Mainly on terraces in older alluvium and outwash from upland and well-drained creek bottoms. Rare on newer soils. Widely distributed, but scattered.
Shade Tolerance:	Intolerant.
Flood Tolerance:	Weakly tolerant. Seedlings relatively intolerant to flooding.
Reproductive Characteristics:	Seed dispersed Sept. - Dec. by gravity and animals, largely by squirrels and rarely by water. Establishes as scattered individuals in shade or openings. A poor sprouter.

Common and Scientific Name:	**Swamp chestnut oak** (*Quercus michauxii*), also known as cow oak and basket oak.
Occurrence in Bottomlands:	Common in large creek bottoms on best, well-drained loamy ridges. Occasionally on a wet, silty clay, high flat. Rarely on recent alluvium, but typically a tree of older alluvium sites. Occurs on similar sites as cherrybark oak.
Shade Tolerance:	Moderately intolerant.
Flood Tolerance:	Weakly tolerant. Seedling intolerant to flooding.
Reproductive Characteristics:	Seed dispersed in Oct.-Dec. by gravity and animals. Seed germinates soon after seed falls. Best seedbed is moist and well-drained with a light cover of leaves. Seedlings require full sunlight for best development. Small stumps sprout well.

Common and Scientific Name:	**Water oak** (*Quercus nigra*)
Occurrence in Bottomlands:	Widely on loam ridges in first bottoms (recent alluvium) and on any ridge and silty clay flat in second bottoms or terraces (older alluvium)
Shade Tolerance:	Intolerant.
Flood Tolerance:	Weakly to moderately tolerant. Prolonged submergence of seedlings during the growing season will kill the trees.
Reproductive Characteristics:	Seed dispersed Sept.-Nov. By gravity, birds, animals and water. Seedlings establish best on moist, well-aerated soil. Small stumps sprout readily.

Common and Scientific Name:	**Willow oak** (*Quercus phellos*) **Pin oak** (*Quercus palustris*)
Occurrence in Bottomlands:	Widely on ridges and high flats of major streams. Less common in creek bottoms. May form nearly pure stands of poor quality on hardpan terrace soils. Grows best on flats of old alluvium and on clay loam ridge of new alluvium.
Shade Tolerance:	Intolerant.
Flood Tolerance:	Weakly to moderately tolerant. Seedlings among oaks are one of the more tolerant to water, but prolonged submergence during growing season is fatal.
Reproductive Characteristics:	Seed dispersed Oct. - Dec. by gravity, birds, animals and water. Frequent acorn crops. Stumps under 12 inches in diameter sprout well.

In summary, cherrybark oak and swamp chestnut oak grows best on older, well-drained alluvium (terraces) that does not flood. These species do not like to get their feet wet. Shumard oak is found in the transition areas between flats and terraces. Water, willow and pin oaks are usually found on the poorly-drained

flats (silty-clays) of backwater flooding areas. Nuttall oak is a "generalist" and tends to grow on a broad range of sites.

Most of our bottomland oak forests are mid-successional and are even-aged, originating from a disturbance. Most oaks will be found on older alluvium and not on sites with prolonged flooding every year. Oak seedlings, regardless of species, will not tolerate an extended period of flooding when young. Thus plantings should be free of prolonged flooding for 2 to 3 years to allow the seedlings to get acclimated to that site.

In the natural development of bottomland oak forests, oaks were probably in the minority in the mix of species at regeneration, but emerged over time to become a dominant species. Thus, planting 500 seedlings of oak per acre (similar to pine planting) is probably a wasteful and expensive venture. We suggest planting 200 or so oaks per acre at wide spacings and allow the other, shorter-lived, bottomland trees to fill in the gaps. Even with 100 oak trees reaching overstory (50 percent survival), that is more than enough to have an oak-dominated stand.

Many of our conservation plantings are converting agricultural fields or pastures to trees. Soil types, natural drainages, and the lay of the land have been masked by years of keeping these fields relatively flat. Detecting subtle changes in site quality is difficult, but must be done to match the correct species to the site condition. Changes of 3 to 6 inches in elevation can have a marked effect on soil drainage, soil texture and the type of tree that will prosper on that area. More mistakes and tree planting failures have occurred in areas where one tree species is planted across a large area with differing site qualities. Matching the species to the site will alleviate many of these planting problems.

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# # #

Insects and Fungi in our Forests

Larry Tankersley, Extension Assistant, Forest Management

Insects and fungi seem to be more prevalent this summer than in summer's past. Most agree that in areas still deficient in the water budget from the past few years, the forest is having trouble defending itself. Where the general vigor of the trees has been compromised the insects and fungi are just taking their opportunity. Many of the "pests" and "diseases" are **endemic**. This just means that they are native to our forests and are present all the time. Their levels or numbers however can go from "you can't hardly find them" to **epidemic** levels that kill large numbers of trees. When levels rise even casual forest observers notice. Southern pine beetle numbers have been at epidemic levels in East Tennessee for the last several years but seem to be returning to endemic levels this year in the same area. (Forest owners some where in the State notice a particular pest or pathogen every year.) Contrary to our first impressions an epidemic in Middle or West Tennessee would not necessarily mean that insects from East Tennessee moved(the insects don't live that long). It would mean that conditions for population build up were occurring in that new epidemic area.

Predicting insect and disease epidemics is difficult as the conditions are complex and imperfectly understood. We do however understand enough to "**rate our hazard**". Hazard rating is a major component of forest management. Hazard ratings are available for many of the most damaging insects. Where a formal(published) rating system is not available we generally consider the **age**, and **density/stocking** of our forest and the **site quality**. Older trees, crowded trees on marginal sites always seem to be involved early in an epidemic situations. Younger, vigorously growing trees with adequate space on better quality sites seem to be

involved only after the epidemic is fully evolved. Of course there are a wide variety of situations between these extremes.

It would be in a forest owner's interest to rate the potential for loss and be aware of insects and fungi that could become threats should their trees become stressed. Loss is generally being defined as diminished timber value, but tree death affects preferred wildlife species and for many folks the general aesthetic of the forest. Tree death to insects or fungi could otherwise be considered a fascinating characteristic of a healthy forest.

Limited options are available for most pests considering the fact that many are ever present and the area involved limits prudent use of insecticides or other means requiring "application". The advise most often given is to maintain tree vigor by regulating the number of stems as they age such that individual trees have room to grow. The appropriate number of trees will vary depending on your species preferences and the site quality. Replacing stands of trees with younger more vigorously growing trees is also an option especially for so called "early succession" species that will with time be replaced by those species who can reproduce in shade. For assistance contact your county agent.

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# # #

4-H Forestry CD's Available!!

Larry Tankersley, Extension Assistant, Forest Management

CD's are available with training materials for your forestry teams. If has always been my goal that you have enough material for a year-round program in forestry or at least as much as you can stand. These CD's are very comprehensive. One CD contains training materials for 95% of the District, State and National contests and much more. The other contains "flash cards" for the Insects and Diseases on the "official" contest list. Now is a good time to be collecting these things and the flash cards will help. You might also use the CD for diagnostics day to day. Let me know if you would like either or both of these CD's.

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# # #

Carter County 4-H'ers are the State Winners in 4-H Forestry

Larry Tankersley, Extension Assistant, Forest Management

Carter County 4-H'ers are back, after a number of years, as State winners in the State 4-H Forestry Contest. The group from Smoky Mountain District worked hard and prevailed over competition from Dickson, Williamson, Bradley and Hardin counties at the contest held this year at the Ames Plantation.

The 4-H'ers from Carter County will represent Tennessee at this year's National 4-H Forestry Invitational in Weston, West Virginia, July 28-August 1. Let's all wish them good luck!

Special thanks to all the agents, volunteers and 4-H'ers involved in this year's Forestry Judging.

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# # #

New Event at the State Forestry Contest

Larry Tankersley, Extension Assistant, Forest Management

I am especially excited about the addition to the State 4-H Forestry Judging Contest of a new event, "Forest Site Evaluation". This is a team event and addresses our long held objective of stimulating critical thinking and information synthesis in the Forestry Judging Contest. My heart swelled with pride at young minds were obviously hard at work. Despite the rain interrupting our train of thought, we persevered and conducted this first ever site evaluation event. Our Extension program is commended for these efforts and opportunities we have afforded Tennessee's young people. Here's how it looked at a judge..

As per the contest rules, each team was given a work sheet and a scenario that was read aloud and explained prior to commencing the event. Notes were added to the Hopper family objectives, especially important to note was that despite the need for cash the Hopper's were unwilling to render the stand under stocked. The judges (David Mercker and I) found the stand to be understocked following the suggested procedure for Part 2. Let's go over the score sheet!

Part 1. The students were told the soil was deep and that the slope percent was a rise of 6 feet in a run of every 60 feet. The resulting slope percent was therefore 10% (rolling). The aspect of the slope as described to the students from the top of the hill along the road leading into the site to the low point in the forest was generally facing northeast. The quarter acre delineated for the students rested on the lower 1/3 of the slope. Circling these correct answers arrived at the conclusion that the land capability class was excellent.

Part 2. There was no evidence of a grazing problem or any type of fire, therefore the site was ungrazed and unburned. We found all of the potential tree sized present in the quarter acre.
The forest type was red oak, white oak and hickory. The stand origin is mixed (seedlings and sprouts). Average diameter was 13 inches on 18 trees (times four) equals 72 trees per acre. Reading the table on page 22 of the rules, we conclude the stand is understocked. You and the students should pay particular attention to this characteristic of any forest when deciding your recommended practices in part 4.

Part 3. Tree measurement, crown class determination and an introduction to estimating dollar($) value. Our answers are shown on the enclosed copy of the "key". BLO is black oak and WHO is white oak. Note the volume and the value stated are "per acre" numbers.

Part 4. The real challenge of this event and is admittedly arguable, but our discussion as the area was judged followed from the "data" collected for parts 1-3. The Hoppers needed cash but they qualified their needs with a desire to maintain the forest in a good condition for future growth. Recall that they were unwilling to capture the value of roughly $650/acre if it would leave the stand understocked and reduce the appeal for hunting. We felt that all sites should be 1) protected from wild fire and that 2) the stand is not yet merchantable, leave it alone to grow. These were the best recommendations given the charge and the state of the forest.

Best management practices were not needed at this time as we were not recommending activity. The landowners did not express any interest in a non-timber enterprise. There did not seem to be any need to work the wildlife habitat or recreational opportunities. Fencing was not necessary as the site was ungrazed and cows were not in the immediate vicinity. No disease or insect problems were noticed to require a salvage or sanitation cut. Generally we cannot conduct selection cuts or thin when a stand is considered understocked.

I hope that this brief discussion will be helpful in reviewing your efforts and preparing for future applications of this process either at this contest or when you become involved with forested properties. Your comments are encouraged and expected as we work together to make this an important part of our 4-H forestry program.

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# # #

Determining Stand Origin for the 4-H Contest

Larry Tankersley, Extension Assistant, Forestry Management

Forest type and history of the stand are important. Hard pines including loblolly pine generally do not sprout. Pitch pine and shortleaf pine can but seeding or planting is more common. For hard pine, the oak types almost always are established from both sprouting and seedlings. Thus mixed is the general rule for this forest type especially if it is been in place over 50 years. Forests showing evidence of most recently being an old field (redcedar understory) may tend to be more seeding (bluejays mostly). Visual cues for sprouting is two stems originating at groundline from the stump. Sweep in the first log could also be caused by a sprout that is significantly reduced or has disappeared but was present at an earlier time. I do recall an oak on the plot that had a sprout with a 3-4 Dbh side stem originating at ground line.

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# # #

Plan for Fall Food Plots Now

Craig Harper, Assistant Professor, Wildlife Management

It's not too early to be thinking about planting food plots for wildlife this fall. Collecting soil samples and preparing the site by mowing, spraying, burning, and liming should be done soon for plots that are to be planted in late August/early September. The first step, however, is collecting a soil sample and having it tested. By doing this now, you can have the results in time for seed bed preparation.

Areas to be planted that are rank with brush and/or high weeds should be bushhogged now and sprayed before planting to help control future weed problems. This is especially true if you plan to plant a perennial plot (e.g., ladino clover) where fescue is currently growing. Many times it is advantageous to burn the debris left after mowing to facilitate seed bed preparation.

It is not too early to lime fields that are to be planted this fall. Although lime begins to react in the soil soon after application, it may take up to 6 months before the full change in pH is realized. Liming is probably the single-most important factor in establishing quality forage food plots. Not only does liming increase soil pH, making nutrients (fertilizer) more available and increasing effectiveness of herbicides, but liming also helps correct calcium and magnesium deficiencies—both of which are important to white-tailed deer.

Now is also a good time to bushhog existing perennial forage food plots to help control weeds. Wait until September to mow again, top dress with the appropriate amount of lime and fertilizer, and spray weeds. Food plots rates and additional maintenance recommendations will be given next month.

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# #

TENNESSEE FOREST PRODUCTS MARKET REPORT

2nd QUARTER 2002

	EAST TENNESSEE	WEST TENNESSEE	STATEWIDE AVERAGE
STUMPAGE			
PINE SAWTIMBER $/MBF DOYLE	185	332	259
OAK SAWTIMBER $/MBF DOYLE	212	381	297
MXD HDW SAWTIMBER $/MBF DOYLE	162	171	166
PINE PULPWOOD $/CORD	13.11	18.69	15.90
HDW PULPWOOD $/CORD	11.53	10.80	11.17
DELIVERED			
PINE SAWTIMBER $/MBF DOYLE	311	380	346
OAK SAWTIMBER $/MBF DOYLE	446	475	461
MXD HDW SAWTIMBER $/MBF DOYLE	298	261	279
PINE PULPWOOD $/CORD	55.48	55.45	55.46
HDW PULPWOOD $/CORD	59.96	56.39	58.17
CHIPS – PINE $/CLEAN TON	-	-	20.07
CHIPS – HDW $/CLEAN TON	-	-	20.06

Note: This information is for educational use only by Tennessee Agricultural Extension Service. Price information adapted by permission from Timber Mart-South, a copyrighted publication by F.W. Norris, Highlands, NC. and is not to be copied for public distribution.

***EXPLANATORY NOTES*:**
PRICES: Prices given in this report are average prices in the current issue of Timber Mart-South. Prices for specific timber stands or products may vary significantly from the average prices listed due to location and accessibility of the timber, volume per acre, area included in the sale, restrictions placed on the harvest, size, quality and species of the stand or delivered product, and local demand.

Stumpage price is the price of timber standing in the woods.

Delivered price is the price of harvested products paid at the mill for sawtimber, or the loading point (with no freight included) for pulpwood.

Prices for sawtimber are given in dollars per thousand board feet ($/MBF) based on the Doyle log rule. The Doyle rule is the predominate rules for measuring tree and log volume in Tennessee. To convert prices to the International rule multiply the price by 0.61. To convert to the Scribner rule multiply the prices by 0.74. (Note: these conversions are for average values and cannot be used to convert individual log or tree volumes.)

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