



Forestry, Wildlife & Fisheries Update Newsletter

Department of Forestry, Wildlife and Fisheries
George Hopper, Department Head

February 2004

Website: <http://fwf.ag.utk.edu>

Calendar of Events

Feb 26 Native Warm Season Grass
Workshop/Cost Share Program Opportunity
Jackson Experiment Station - - Contact
Mike Hansbrough, NRCS 731-668-0700/112

Feb 27 Native Warm Season Grass
Workshop/Cost Share Program Opportunity
Ames Plantation - - Contact
Mike Hansbrough, NRCS 731-668-0700/112

Mar 1 - 5 Aquaculture 2004, Hawaii
Convention Center, Honolulu
Contact: worldaqua@aol.com

Mar 3 - 5 Annual Meeting of the Tennessee
Chapter of The Wildlife Society

Mar. 9 Henry County Forestry Assoc. Mtg.
"Timber Marketing"

Mar. 18 Madison County Forestry Assn.

Mar. 28-30 International Society of
Arboriculture, Southern Chapter, Opryland
Hotel, Nashville

Mar. 27 Henderson Co. Forestry Assn. -

Apr. 2 Urban Forestry Grant Proposals due
in Division of Forestry Office-Nashville
(see article)

Apr. 6 Monroe County Assn. Mtg.

Apr. 16 Dickson County Assn. Mtg.
- Forestry Field Day

Faculty

Wayne Clatterbuck *Forest Silviculture*
Craig Harper *Wildlife Management*
Thomas Hill *Fisheries Management*
George Hopper *Natural Resources*
Samuel Jackson *Forestry Management*
David Mercker *Forest Management*
Larry Tankersley *Forest Management*

In This Issue

Notes from the Web	Page 1
Management Calendar for February	Page 2
Urban Forestry Grants Available	Page 3
4-H Forestry Contests are Set	Page 3
Timber Investment	Page 4
Harvest Fish to Maintain Balance	Page 5
Refill Ponds and Start Fertilization	Page 5
Fertilizer Platforms and Fish Shelters	Page 6
A Call for Post Harvest TSI using FLEP	Page 7
Veneer Markets - Part 2	Page 7
Goals of Managing Forest Stands	Page 8
Two Aged Regeneration Methods	Page 9
Course Schedules for Foresters	Page 11
Winter Food Plot Fertilization	Page 12

Notes From the Web

Samuel W. Jackson, Web Coordinator/Extension Forestry (865) 974-2946

With spring just around the corner, this is an excellent time to educate youth about natural resources. Whether in a classroom or in the field, kids should be introduced to the natural world around them. There are several websites out there that will help educators to design and implement activities and lessons about natural resources.

The first website to be featured this month is Carly's Kids Corner developed by the National Arbor Day Foundation. It can be found at <http://arborday.com/carly/large.htm>. The site is designed for both youth and educators. The central character is Carly the Cardinal who "participates" in activities with youth. The site boasts four different online, interactive, games that help kids learn about trees and their place in forest ecosystems. There are also two interactive learning activities, "Life of a Tree" and "Majestic Trees of America," that introduce tree growth and structure, as well as historically important trees. The site also has several lesson plans available for educators to use in classrooms or groups, many of which correlate with National Science Standards.

Another website that offers quality youth and educator resources is the Canfor Tree School. Canfor is a Canadian forestry company who has developed the online Tree School at <http://www.canfor.com/5000.asp>. The Tree School offers several different lesson plans for educators. There are downloadable games and links to other resources. The school's strength is that it offers materials and resources for a variety of educational levels (beginner, intermediate, and advanced.) This enables educators to better suit lesson plans and activities to the age group of the youth they are educating. The Tree School will enhance any group activity!

These and other web resources will enable you as educators to integrate natural resource education into your programming. By educating today's youth, we are preparing tomorrow's resource managers.

Management Calendar for February

Wildlife

Burn woods (hardwoods and pines) and fields to enhance conditions for wildlife

- make sure firebreaks are in place
- **much** more beneficial for wildlife than bushhogging!
- * If you won't burn, do not bushhog oldfields yet – wildlife needs the cover for another month!

Disc strips around field edges to encourage early successional growth

- disc strips 2 tractor-widths wide (12 – 15 feet)
- can be used as firebreaks

Continue planting trees/shrubs for wildlife

- use as a hedgerow to break up fields into sections
- use soft- and hard-mast producers (see PB 1633 for list of species)

Fertilize/prune trees and shrubs

Erect boxes for wood ducks and bluebirds

- 1 box per 100 yards of shoreline is adequate for wood ducks
- clean out old wood duck boxes and put in fresh wood shavings (about 4 – 6 inches)
- bluebird boxes should be no closer than 80 yards apart
- up to 9 or more bluebirds may roost in a single box during the winter

Continue Timber Stand Improvement activities

- select good mast producers and release their crowns by girdling competitors and spraying herbicide solution into wound (1 quart Garlon 3-A / 6 ounces Arsenal AC / fill to 1 gallon water)

Build brushpiles

- put large stems on bottom, small stems on top

Keep bird feeders full

- black-oil sunflowers are a favorite of many birds
- thistle seed is preferred by goldfinches
- suet provides energy for lots of birds during the winter

Strip-mow dove fields

- complete mowing now for late winter seed source

Plant perennial clover plots

- ladino white clover, alsike clover, white-dutch clover, and birdsfoot trefoil do well when sown in February
- prepare seedbed and amend soil with lime and fertilizer as recommended from soil test
- inoculate seed (if not pre-inoculated)
- use cultipacker to firm seedbed and seed-to-soil contact

Fertilize and lime perennial forage plots as recommended from a soil test

Fisheries

Apply agricultural lime to ponds.

- Takes several months to react to pond bottom, apply now in winter
- Take 10 samples of each pond bottom with a can or stick.
- Dry, pulverize and blend samples.
- Fill soil sample box and send to Soil Test Lab in Nashville.
- Results with recommendations will be sent back to you.
- Lime at least 4 weeks before starting fertilization.

Liquid fertilizers for ponds.

- Spring will be here soon, make 1st application in early March.
- 8 or 9 applications will be needed throughout the year.
- Dilute with water before applying.
- Researchers recommend 4 lbs of phosphate per acre in ponds with light fishing.
- Recommend 8 lbs. per acre where heavy fishing is expected.
- Should result in increase fish production and control of aquatic plants and filamentous algae.

Urban Forestry Grants Available

Bruce Webster, Staff Urban Forester, Division of Forestry

The Tennessee Department of Agriculture, Division of Forestry is announcing the availability of the Urban and Community Forestry grants for 2004. Eligible applicants include local governments non-profit organizations and educational institutions.

"The grants have helped many communities to increase their trees and to better manage and maintain the trees they have," says Bruce Webster, Staff Urban Forester. "We are fortunate to have the USDA Forest Service provide this funding to Tennessee."

Projects will be funded in 3 categories. They are personnel to hire urban foresters at the local level, projects to help manage trees or to provide education/training about the management and care of trees, and tree planting.

Proposals will be due in the Nashville Office of the Division of Forestry by 4:30 P.M. on Friday, April 2, 2004.

Additional details on the types of projects along with application forms and proposal instructions are available in grant information packages. These may be obtained by calling or emailing the urban and community foresters, or the website at www.state.tn.us/agriculture/forestry/tdfuf.html

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4-H Forestry Contests Are Set

Larry Tankersley, Extension Specialist, Forest Management

4-H Forestry District Contests are right around the corner.

May 10 Smoky Mountain District at the Knoxville Experiment Station

May 11 Cumberland Location TBA

May 12 Central Location TBA

May 13 Western, Location TBA

June 17th is the date for the State Contest and it will be in the Cumberland District. If you have ideas and/or opinions about locations let your District Program Leader know so we can make arrangements ASAP.

I am not planning any changes to the rules this year. Last year's rule book will be the one we use. If you need more books, let me know.

I would still like to do some in-service training for you and your volunteer leaders. If a couple of counties want to work out a visit prior to the contests, let me know and we'll try to make arrangements.

Keep in touch if we can help you prepare for these contests.

For more information contact: *Larry Tankersley at 865-974-7346*
ltanker1@utk.edu

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Timber Investment

Larry Tankersley, Extension Specialist, Forest Management

Timber is defined by the IRS as real property. That is investment property or income-producing property. How then does it compare with stocks that I invest in?

Liquidity – Markets are reliable in most places even if the products transacted are limited in some areas. Income from Timber sales is periodic as opposed to annual for most timberland owners.

Tax Treatment – Proceeds receive capital gains treatment, typically long-term treatment as timber is a long-term venture for most folks.

Risk – Risk can be high. Meteorological and biological risk, can be managed but may require additional costs for operations removing unmerchantable trees. Regulatory risk is perceived as some as a risk. Human caused problems such as timber trespass and other intrusions can also be managed for a profit with effective use of hunting/recreational leases.

Timber Mart-South(TMS), a timber price reporting service, recently compared \$10,000 investments in five vehicles: the NASDAQ, the S&P 500 Composite Index, the S&P Paper and Forest Products Index, pine sawtimber and mixed hardwood sawtimber. Timber values used in the analysis were from TMS south-wide average standing timber prices. Biological growth was incorporated with price appreciation or depreciation for the timber assets only. The land portion of the timberland investment is not considered in this analysis.

From early 1993 to the beginning of 2003, an investment in pine sawtimber more than tripled. At 12.3 % annually, this was greater than the S&P 500 which was up only 9.3% during the same period.

The mixed hardwood sawtimber investment had a steady growth rate of 8.8% per year with the \$10,000 doubling in the ten year investment. The NASDAQ and the S&P Paper and Forest Products Indexes performed at 7% and 4% respectively.

It is very important to note the importance of price trends and growth potential of forest investments. For example, pine sawtimber prices increased at 3.1% over the past ten years. Added to the biological growth of 6.5% these numbers approximate the 12.3% growth in the investment. Hardwood growth was assumed at 3.5% annually.

Investments in timber can be, and in most cases, are profitable. Tree growth is much like dividend reinvestment, without the tax consequences. Tree growth often responds to management.

Thanks to Tom Harris and Sara Baldwin at *Timber Mart-South* for conducting and sharing this perspective.

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Harvest the Fish that Are Produced to Maintain Balance

Thomas K. Hill, Professor, Fisheries Management

A very important practice in the management of farm ponds is to harvest the fish once they have been produced. Unfortunately, this particular practice is often neglected and, predictably, imbalance of the fish population results within a year or so.

In the second year after being stocked, a largemouth bass-bluegill pond will contain the maximum pounds of fish for its fertility level. The weight of fish in the pond is determined by the food supply that has developed from the available nutrients. Once the maximum crop is reached, growth of smaller fish is stimulated only as larger fish are harvested. Catch 50 pounds of fish per acre from an unfertilized pond and 50 pounds of fish will grow back. Fertilized ponds will produce 3 to 4 times this many pounds of fish so lots more fishing is required.

A new pond is ready to fish when the bass have reproduced successfully. The bass should be fished lightly for the first 2 or 3 months after spawning or too many of the easily caught yearlings will be removed. Harvest 4 to 5 pounds of bluegill for each pound of bass. To have the best continuous fishing, both bass and harvestable size bluegill must be taken.

Spread the catch out. You will have periods of good fishing and not-so-good fishing, but for consistently good results year after year try to harvest 5 to 6 pounds of fish per acre per week from a balanced fertilized farm pond from March to November. It is just good pond management to remove and use any caught fish that are large enough for food. Bluegill in the catch that are considered too small for the table should not be returned to the water. Since bluegill are so prolific, sufficient numbers will always be present in a pond.

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Refill Ponds and Start Fertilization

Thomas K. Hill, Professor, Fisheries Management

March is a good time to refill ponds and start fertilization. Ponds will need to be fertilized for them to reach their potential. Proper fertilization increases available food along the food chain so a pond supports more pounds of fish. However, if total alkalinity of the water is below 20 ppm, fertilization will not stimulate a good bloom. Take a bottom mud sample, dry it and have the UT Soil Test Lab check to see how much lime is needed. Apply the recommended amount of lime over the entire pond bottom during the winter.

A simple method of knowing when to fertilize a pond is based on water clarity. Light penetration can be measured using a Secchi disk. An optimum bloom allows light to a depth of 18 to 24 inches.

Liquid pond fertilizers have been available for several years and do a wonderful job of stimulating plankton booms. In fact, research has shown that concentrations of phosphate are available in the pond water sooner and remain available longer than comparable analyses of granular fertilizer. A gallon of liquid 10-34-0 yields slightly more than 4 lbs. of phosphate. The researchers recommend 4 lbs. of phosphate (P₂O₅) per acre in ponds with light fishing and 8 lbs. in ponds where heavy fishing is expected.

The first application of fertilizer should be **made in early March** and then as often throughout the summer as needed to maintain a good plankton bloom. Usually, 8 or 9 applications will be needed per year. Liquid fertilizers are heavier than water (they weigh about 12 lbs./gal) so they should be diluted with water before application. Pond fertilization should be stopped by mid-October.

Liquid fertilizer is available at most farm supply stores and will cost \$17.50-20.00 for 5 gallons. This means you can fertilize an acre pond for a summer for around \$50. **Considering the increased fish production and the resulting control of aquatic plants, this would be money well spent.**

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Fertilizer Platforms and Fish Shelters

Thomas K. Hill, Professor, Fisheries Management

Natural vegetation should be kept out of farm fish ponds, but two kinds of manmade structures in ponds can be very beneficial to fish. Both fertilizer platforms and fish shelters have their place in fish pond management.

A submerged platform provides the most efficient method of applying granular fertilizer to a pond. Fertilizer dissolves slowly and is distributed in the upper levels as the water washes over it. Platforms may save about one-fourth of the fertilizer costs, because nutrients do not get tied up in the bottom mud as they do when broadcast fertilizer settles to the pond bottom.

The platform should be located 10 to 15 feet from the shore, as far from the overflow pipe as possible — with a walkway for carrying the bagged fertilizer. The floor should have no cracks and be submerged 12 to 18 inches. One platform can be used for each 14 acres of pond surface.

Fish shelters are not necessary for good fishing in ponds, but experiments have proven them effective as feeding sites for concentrating fish. Small fish feeding on invertebrates in and around the shelter attract larger fish. As a result, angler success can be greatly improved.

Shelters should be constructed on the pond bottom where the water is five or more feet deep. They should be open enough to allow free movement of large fish in and about the shelter. Small openings offer protection to smaller fish and could promote overpopulation by forage species. Trees make good fish shelters, but the smaller limbs should be removed before they are submerged.

Fish attractors provide a place for some small fish to temporarily escape predation. In so doing, larger fish are attracted to a site known by the angler. Trees, stake beds, rock or block piles and tire reefs are all good attractors. Place no more than three per acre and have the openings large enough for big fish to pass through.

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###

A Call for Post-Harvest TSI Using FLEP

David Mercker, Extension Assistant II, Forest Management

It should be automatic . . . following up a hardwood timber harvest with timber stand improvement. Common perception is that forest management ends with the harvest. Rather, this is where it *begins*. There are a number of silvicultural practices recommended after a harvest to assure proper development of the next forest. With the new Forest Land Enhancement Program (FLEP), the TDA Forestry Division has cost-share funds available for post-harvest TSI to assist the family forest.

Most hardwood forests shouldn't be harvested with a single, broad-brush silvicultural prescription. Instead, family forests are more a conglomerate of small, unique areas, falling within the larger forest stand. Each of these smaller areas should be managed with careful analysis of what the forest structure indicates. This is precision forestry, and it means that young areas are avoided, intermediate areas are thinned, mature areas are regenerated, and abused areas are culled . . . all of this in a patchwork fashion within the same stand.

Once harvested, TSI is necessary to complete the management of the patchwork. For instance, young areas need crop tree release, regenerated areas require site preparation for natural regeneration, and abused areas have additional culls to kill. Consulting foresters and/or landowners can do this work, and with guidance from the Forestry Division, FLEP funds can be used for cost-share.

Timing is vital. Post-harvest TSI should occur by the end of the second growing season after the harvest. Consider:

- landowner interest is still high,
- reinvestment funds produced by the harvest are still available, and
- field work is more easily completed before forest re-growth occurs.

Professional foresters in Tennessee are a source of first-hand expertise for family forest owners, and as a matter of course, can now recommend post-harvest TSI. With the new FLEP program, this underutilized silvicultural practice will be more attractive to landowners and consulting foresters alike. And stewardship *after* the harvest can become the norm.

For more information contact: *David Mercker, Extension Assistant, Forest Management*
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Veneer Markets (Part 2 in a series of 7 articles)

David Mercker, Extension Assistant II, Forest Management

Markets for veneer are classified as: markets for **veneer trees** and **veneer logs**. Forest owners are most concerned with markets for their veneer trees. Many wrongly-informed landowners have mistakenly sold fine veneer trees as standard lumber trees, receiving a fraction of full market value. Landowners who are not expert at identifying, measuring, and appraising veneer trees should seek the assistance of an experienced professional forester.

Most loggers, timber buyers and mill operators are potential markets for standing veneer trees. Such individuals often have direct markets with veneer mills, and for small quantities of veneer trees, are landowner's best opportunity. However, when a timber sale has exceptional quality veneer trees, or a large quantity of them, owners should extend beyond these markets and include the veneer mills. Hardwood veneer buyers are scarce and there are very few hardwood veneer mills, particularly in the Southeast. Locating one often requires a forester.

Veneer logs are marketed to four major uses: architectural, secondary manufacturing, profile-wrapped mouldings, and paneling. The **architectural market** is for premium logs only - those without defects, longer lengths and a narrow, well centered heart. Architectural veneer becomes wall paneling in executive offices and public buildings. Groups of veneer trees originating from the same forest are especially sought after for this market because their physical traits (color and texture) will be similar. These trees can be bulked and marketed together and used to fill large orders for the same building. The **secondary manufacturing market**, which serves primarily the furniture, cabinet and flooring industry, is less rigid in quality specification than is the architectural market. Shorter lengths of veneer are used which can be cut between defects. Uniformity in wood color, however, is important for consistency in product. **Profile-wrapped moulding market** is a market that fits between the previous two. This veneer is wrapped or glued around reconstituted products such as fiber-board and is used to substitute for solid wood moulding. **Wall paneling market** is the lowest class and includes eight-foot mismatched wall panels. Because panels do not need to match, some wood defects (if sound) are acceptable.

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Goals of Managing Forest Stands

Wayne K. Clatterbuck, Associate Professor, Forest Management & Silviculture

Forest stands are managed to achieve some combination of desired products or values. These products or values may include tangible benefits such as income from timber production or fees for hunting rights. The values may be intangible such as the satisfaction of seeing wildlife or flowering plants, having a scenic view, enjoying recreational activities or just the simple pleasure of watching nature over time.

With such a diversity of benefits, landowners and land managers should first define land ownership goals/objectives before any decisions are made on how to manage the land. For some objectives, management may be very intensive. For other objectives, proper management may involve doing nothing more than providing protection against damaging agencies such as fire, insects and diseases.

The manipulation of forest cover is the primary tool of the forester to implement prescriptions that address the objectives of ownership; it will influence aesthetics, visual and biological diversity, wildlife habitat, water yields, plant and animal species composition, tree growth, economic returns and many other forest attributes. Some of the most important stand management activities are:

Establish regeneration. For long-term forest development and sustainability, establishing regeneration of desirable species is one of the most critical management tasks and is often the task most neglected.

Control species. Species composition determines the timber value produced, food and habitat value for wildlife and scenic value. Species composition also determines growth potential since certain species grow faster than others.

Control density. Stand growth and yield and timing of yield are determined by stand density. In dense stands, individual trees grow slowly, harvests are delayed, economic returns are reduced and trees with poor vigor are more susceptible to insect and disease damage. Such stands offer little vegetative cover or browse for wildlife. In stands that are too open, total yield may be reduced and individual tree quality is often poor because of excessive branching and other bole defects.

Reduce losses to insects, diseases and fire. By providing adequate growing space and maintaining desirable species mixtures through timely silvicultural treatments, forest stands remain healthy and losses to insects, disease, and fire are minimized.

Enhance non-timber value. The quality and quantity of nontimber benefits are affected by stand management practices. For example, dead snags and den trees can be protected for wildlife, minimum disturbance zones can be identified and harvest cuts can be distributed in time and space to assure consistent wildlife habitat. With forethought and planning, many nontimber benefits can be enhanced with little effect on timber production.

Forests should be managed to meet specific landowner objectives or combination of objectives. Silvicultural practices are implemented to move each stand toward meeting those objectives by manipulating vegetation. Most stand management practices are aimed at establishing regeneration; controlling species composition and density; reducing loss from insects, diseases or fire; and enhancing nontimber values.

Adapted from Central Hardwood Notes, USDA Forest Service, North Central Forest Experiment Station

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Two-Aged Regeneration Methods

Wayne K. Clatterbuck, Associate Professor, Forest Management & Silviculture

A number of research efforts are currently evaluating the two age regeneration method for use in eastern hardwoods. Two-age methods, such as deferment cutting or irregular shelterwoods, when initiated in sawtimber stands, generally involves the removal of all but 15 to 25 square feet of basal area per acre of overstory trees. The residual overstory trees are termed reserves or standards.

The limited number of reserve trees allows abundant light to reach the forest floor and provides for the rapid growth of the understory and the development of two age classes. The treated area is subjected to site preparation treatments similar to what might be done in clearcut situations to promote desirable species. The reserves are left standing around the treated understory. In contrast to the shelterwood method, the reserve trees will be left standing for a second rotation thus maintaining two predominant age classes. The low basal area of reserves is necessary to ensure continued rapid growth of the regenerating age class.

Two-age methods have the ability to deliver several important advantages compared to other regeneration cuts commonly employed such as clearcutting:

- Maintenance of sexual reproduction throughout the rotation
- Maintenance of advance reproduction development throughout the rotation
- Reduced visual or aesthetic impact, especially compared to clearcutting
- Development of large diameter trees, which can increase in value with time.

The maintenance of sexual reproduction and potential development of advance regeneration throughout a rotation may be critical in maintaining our ability to regenerate stands of oak. However, two-age methods also have some risks.

- Reserves should be of an age where they will prosper for a second rotation. Often these reserves are already mature or excessively mature such that they will not survive through an additional rotation length.
- Some species have a tendency to epicormic branch that decreases the future value of the tree.
- Single trees are much more susceptible to storm-related damage.

The choice of prescribing two-age methods will depend on the tradeoffs between timber production; obtaining and developing desirable regeneration; aesthetics; and risks associated with maintaining large trees for an additional rotation length. Two-age stands will ameliorate some of the visual effects of clearcutting, however timber production and value might decrease. This regeneration method may be more favorable to promoting regeneration and further development of oak species when compared to other alternatives. Based on limited research, white oak, hickories and yellow-poplar seem to be the longer-lived species that are amenable to two-age methods because of their longevity. Red oaks are too short-lived to be a favored species with this regeneration method.

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Course Schedules for Foresters

Larry Tankersley, Extension Specialist, Forest Management

Visit the Tennessee Forestry Association for more information at www.tnforestry.com or you may call or e-mail me, Wayne Clatterbuck, or David Mercker if you need assistance.

Master Logger 5-Day Course

****All participants MUST complete ALL five days to receive certificate and card!**

Dover, TN	Cindy's Catfish Restaurant
Wednesday, February 25	Safety
Wednesday, March 10	Best Management Practices
Tuesday, March 23	CPR/First Aid
Wednesday, April 7	Silviculture
Tuesday, April 20	Business/Graduation
Dunlap, TN	Studer Management Office
Wednesday, March 17	Safety
Wednesday, March 31	Best Management Practices
Wednesday, April 14	CPR/First Aid
Wednesday, April 28	Silviculture
Wednesday, May 5	Business/Graduation
Kingsport, TN	Weyerhaeuser Office
Wednesday, May 26	Safety
Wednesday, June 9	CPR/First Aid
Wednesday, June 23	Best Management Practices
Wednesday, July 14	Silviculture
Wednesday, July 28	Business/Graduation

Master Logger Continuing Education Class Schedule

March 11 Spring City
April 6 Dover
April 29 Wartburg

Teacher's Conservation Workshop - (look for article in upcoming issue)

June 20-25 University of Tennessee, Knoxville, TN
July 7 - 11 Lambuth University, Jackson, TN

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Winter Food Plot Fertilization

Craig Harper, Associate Professor, Wildlife Management

You can stimulate forage production for wildlife by fertilizing food plots in late winter before the growing season begins. Fertilize plots of cool-season grains (oats, wheat, rye) with 30 – 50 pounds of nitrogen per acre (that is, 1 or 2 bags of 34-0-0 per acre) by mid-March. Nitrogen is short-lived in the soil and the effects of fall nitrogen fertilization on grass plots are gone by this time. An application of nitrogen will stimulate growth and provide increased protein to deer, rabbits, and turkeys using the plot.

Clover plots (and other legumes such as alfalfa and birdsfoot trefoil) are able to fix nitrogen through a symbiotic relationship with *Rhizobium* and other bacteria. Nitrogen fertilization is not necessary for pure legume plots at this time. However, if you have a plot mixed with clovers and small grains (oats, wheat, or rye), an application of 30 pounds of nitrogen per acre may be warranted, especially if the grains look pale and/or if the plots are receiving a considerable amount of use.

Phosphorus and potassium are longer lived in the soil and their application rate should follow the recommendations of a soil test. If you haven't tested your soil, it's not too late. Visit your county Extension office for a sampling box and instructions. Soil tests are generally available within 2 weeks, sooner if you request the results via email.

The effects of fertilization are reduced if the soil pH is too low (below 5.8). For maximum nutrient availability to food plot forages, the pH should be maintained at approximately 6.5. The effects of liming are also long-lived, usually lasting at least 3 to 4 years. If you are going to establish a new food plot this spring or fall, go ahead and have a soil sample tested and apply the recommended amount of lime now as it takes 5 to 6 months for the full effect of liming to be realized. Your preparation and work now will pay off in a big way come April and November when you look for long beards and wide antlers!

For more information contact: *Craig Harper at (865) 974-7346*
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The Agricultural Extension Service offers its programs to all eligible persons regardless of race, color, national origin, sex, age, disability, religion or veteran status and is an Equal Opportunity Employer.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS

The University of Tennessee Institute of Agriculture, U.S. Department of Agriculture,
and county governments cooperating in furtherance of Acts of May 8 and June 30, 1914.

Agricultural Extension Service

Charles L. Norman, Dean