UTEXTENSION
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE






FORESTRY, WILDLIFE & FISHERIES UPDATE NEWSLETTER

MAY/JUNE 2015

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Center for Native Grasslands Management

The University of Tennessee Institute of Agriculture Center for Native Grasslands Management is one of the best community-campus partnership. As part of the university's successful Carnegie Community Engagement Classification application process, the Office of Research and Engagement has compiled a list of fifty of UT's best community-campus partnerships. The university will be celebrating its status as an engaged institution throughout the year by featuring these individual examples in articles that highlight their unique contribution to the community. The collaborative **Center for Native Grasslands Management** focuses on improved outcomes for farms, forests, and rural communities throughout Tennessee, the Southeast, and the eastern United States. The center promotes the advancement of science in grasslands conservation, including forage production, sustainable forest management, biofuels production, wildlife conservation, and economic development. This multi-disciplinary approach in turn has provided community-based training and learning opportunities for scores of graduate and undergraduate students.

Related Video: Tennessee farmers grow hay and native grasses in all 95 counties, making healthy fields a critical part of our state's economy. UT's Institute for Agriculture partners in native grasslands research with the Natural Resources Conservation Service and Tennessee Farm Bureau, which has provided nearly 2,000 cattle for this program.
https://www.youtube.com/watch?v=W2kR-rq_jVg&feature=player_embedded

Using Native Grasses for Livestock in the Eastern US Webinar

Related Video: Details of native grasses and the recommended species to use for various purposes, along with establishment challenges, grazing management practices, and ensuring sustainability of these grasses are discussed. Dr. Patrick Keyser addresses how native grasses can be used to add production to the warm season to complement typical cool-season grass-dominant pastures. Nutritional values of native grasses will be included in the presentation. This webinar increases conservation planning knowledge and skills to use native grasses as part of a managed grazing system in the eastern U.S

https://www.youtube.com/watch?v=mZAaOpGyU0E

Fisheries Questions? Who You Gonna' Call?

Have you often had questions about your pond, stream, fish, water quality, algae, fisheries production and farming methods? The University of Tennessee Institute of Agriculture have "Fisheries First Responders" in place to help with any questions you may have. But first you should follow the suggestions below to be able to get quick responses to your questions.

First contact is with your U.T. County Extension agent. To find your county website go to https://extension.tennessee.edu/Pages/Office-Locations.aspx. Then click on your county name to visit your county Extension Office's website and get to know your local Extension agents. You will find the office phone number, agent's names and e-mail contact information.

You can also research your questions from the following website and then call your agent. Researching will help you give the agent a more informed question. Information is available on more than 20 species of fish and shellfish produced in the Southern Region. http://srac.msstate.edu/publications.html. Remember to take pictures to send along with your questions through e-mail. You will get a quicker response.

If further assistance is needed, the agent will contact the Regional Fisheries Agent/First Responder.

If the county agent cannot be contacted and you have an emergency, you may contact the Regional Fisheries Agent directly.

Fishieres Agent / "First Responders"

Western District
Ronald Blair, Extension Agent and County Director
Henderson County Agricultural Extension Office
P. O. Box 159
Lexington, TN 38351
731-968-5266
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Firewood Time in Tennessee

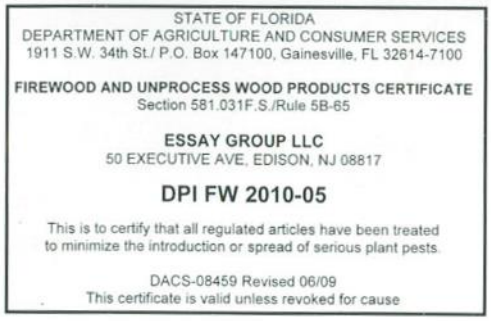
Adam Taylor, Associate Professor, Material Science and Technology Unit

The beginning of the hot weather may seem like a strange time to think about heating with wood but there are reasons to consider your firewood supply right now. Firstly, a camping trip isn't complete without a nice camp fire – and, depending on where you are camping, suitable firewood may now require some special treatment. Secondly, if you want to have safe, effective firewood for your stove or fireplace this fall, then you need to get it started drying now.

There is growing concern about insects and other pests getting moved around the country. Emerald ash borer, walnut twig beetle and gypsy moth are just a few of the more notorious examples – and these insects are often moved around in firewood. Firewood is of particular concern because a) it still has bark on it and many insects live in the bark, b) it normally hasn't been 'kiln dried' like lumber, a process that will kill any bugs, and c) firewood is brought to forests all over the country, when campers bring it on their trips.

Because of the concern about firewood spreading insect pests, many campgrounds, parks – even entire states – are requiring that all firewood be heat treated prior to being brought in. The specifics of the heat treatment process vary with the insect of concern but in general the wood needs to get hot enough (130-160F) for long enough (30 -75 minutes) to kill the pests that might be in the wood. Because of the need to demonstrate compliance with these requirements, there are certification schemes associated with these treatments. Thus, you may be asked to buy 'certified' or 'heat-treated (HT)' firewood for use in your camp fire. Please note that the heat treatment process is not intended to dry the wood. The HT process does take place in heated chambers (kilns) but properly drying firewood takes much longer than heat treatment.

Examples of labels on heat treated firewood.



Dry firewood is a much better fuel than the same wood that contains a lot of water. Dry wood of any species is acceptable but wet firewood is hard to get lighted, burns with more smoke, gives off less heat and increases the risk of creosote buildup and associated chimney fires. It is possible in some cases to buy firewood that has been dried in a kiln and generally the extra cost associated with this process will be worthwhile because of the added safety, convenience and efficiency of the dry firewood. However, in most cases, the wood that we buy will be wetter than we would like. Fortunately, all wood will dry naturally if given proper drying conditions and sufficient time. Proper conditions include splitting and cutting the wood to length, and stacking the wood to get some air flowing around the wood. A little rain won't hurt a firewood pile but logs that are sitting on the ground will often rot before they dry. Split and stacked firewood will usually dry to an acceptable level in 3-6 months or so. Hot weather speeds up the process – so, get your firewood pile going now and it will be ready for when you need it!

Thinking About a Timber Sale

Larry Tankersley, Extension Specialist II, Forestry

Years ago when I first started working for Extension, I recommended a timber sale to a person who had an old, crowded pine stand that in my opinion was “beetle bait” i.e. a high hazard for a southern pine beetle infestation. Her response was, “I don’t need the money and besides the government would just get all the money in taxes.”

I was just learning about Timber Taxes at the time, so I mentioned that the government, in fact, didn’t want all the money. I have since come to appreciate that this is the “Big Deal” about Timber Taxes, the Internal Revenue Service (IRS) code has a number of incentives designed to encourage forest landowners to grow more timber.

Timber, trees that can be used as wood products, is considered, by the IRS a capital asset, one that typically increases in value as time passes. Consider tree growth rings, bankers and savvy timber owners recognize that tree growth is actually a very good example of compound interest. The tree when we purchase it is our principle and the growth compounds each year that we hold it. It is important to note that unlike other investments like stocks, mutual funds, etc. we are not taxed each year on this value increase.

Each year during tax time, much of my time is spent explaining timber basis which is a term associated with the ownership of a capital asset. Basis is basically a term which recognizes that we purchase capital assets with money that has already been taxed when it was first earned. Many business owners and other owners of capital are familiar with cost basis which is what we paid for something which we “get back” or recover through depreciation, amortization or other methods where we don’t pay taxes on the money spent again.

With timber, we recover our basis through “depletion” when we sell or otherwise dispose of the timber. Our timber basis is deducted from our gross proceeds when we report our capital gains after a timber sale. Most tax preparers are familiar with basis and will ask you for your timber basis.

It is important when considering a timber sale to consider whether you have a timber basis. Ideally when you obtain timber, either by purchasing it, as a gift, or you inherit it, you would establish a timber basis at that time by completing a Form T (Timber), Forest Activities Schedule. Form T is largely a recordkeeping form that is not often filed but does help timber owners keep up with their expenditures and the tax incentives available to them.

Establishing a timber basis does require a timber inventory and opinion of its value. This information typically requires the assistance of a professional forester and therefore would incur a cost. This, in addition to not knowing about timber basis, is likely why very few folks establish a basis at acquisition. It is interesting to note that the expense of having the timber volume estimated and evaluated can be added to the timber basis. Still the expense can discourage this exercise especially since the dollar value of the basis typically sits unchanged until the timber is ultimately harvested and therefore the actual tax savings resulting from having the basis is difficult to determine looking into the future.

A timber basis however is worth establishing if we are planning a sale soon after acquisition and especially if we inherit the timber as we are allowed to “step-up” the basis. A stepped-up basis allows us to establish the basis on the day of the decedent’s death. Inherited capital assets inherently qualify as “long-term” and can be sold before the 12-month holding period required for purchased capital. Selling timber soon after establishing the basis would likely ensure that the amount we would deduct from the gross proceeds would net to a fairly small net capital gain.

As time passes and your trees grow it becomes increasingly difficult to determine the volume and value of those trees on the day that they became yours. A timber sale after, say 10 or 20 years, typically results in a long-term capital gain. And you are entitled to the reduced tax rates that are the "Big Deal" of timber taxes, but determining your basis may cost more than the tax benefits of the exercise but it's hard for me to say 'cause as with most things tax-related, it depends on your facts and circumstances.

This has been a tedious discussion and you are to be commended if you're still reading. UT extension has a publication that discusses setting up your timber basis and Form T (Timber) at the attached website;

https://extension.tennessee.edu/publications/Documents/PB1691.pdf

For a comprehensive discussion of Timber Tax incentives you should be aware of the Forest Landowner's Guide to the Federal Income Tax at:

www.timbertax.org/taxpolicy/FS_Landowners_Tax_Guide.pdf

Be sure to let us know if you ever need help with any of this.

Hardwood Analysis and Trends (HAT - June 2015)

David Mercker, Extension Specialist II, Forestry

What a difference a few months can make in the hardwood timber and lumber business. **HAT** entered spring reporting strong prices but with concern that all could become lukewarm by summer. We had experienced a very strong rebound from the recession. Lumber supplies had dwindled and that, along with reasonable consumer, demand lifted valuation of most of the species tracked by **HAT**. But the market peaked, and just as strong as the prices once had lifted, they are now dropping.

In a typical year, by winter's end mills have drained their log inventory, and log and lumber prices often experience a bounce due to low supplies. 2015 does not appear to be typical. Prices for the species tracked by **HAT** began to decline in March and have not stopped. In a ten week period ending May 22, the average composite price for red and white oaks, poplar, hard maple, black cherry and walnut, has dropped 11 percent, or about one percent per week. This is an unprecedented decline over the ten years of **HAT**'s reporting, a decline even steeper than was experienced during the 2008/09 recession.

Simply put, lumber production has outpaced consumption. Lumber supply chains are full, for both green and kiln dried material. Export business is off of last year's levels. High inventory often leads to lower prices. A bottom is desperately needed in this current downfall. For those landowners considering selling timber, it might be advantageous to remain patient. But as always, seek the counsel of a professional forester, and perhaps several.

Summarized with permission of the Hardwood Market Report, Memphis, Tn.

Classifying Forest Insects by Feeding Habits

David Mercker, Extension Specialist II, Forestry

Forest entomology is a challenging science. Most of us have little more than passing knowledge of insects in the forest and yard settings, including foresters. Yet Extension educators receive numerous calls involving trees and insects - - damage, identification, and control. *The Woodland Steward* (Fazio 1987) has an excellent section whereby common forest insects are classified according to their feeding habits. By understanding feeding habits, insect control (if necessary) becomes easier. Following is a brief summary of the classifications.

Defoliators – defoliating insects eat the leaves of trees (both broad leaves and needles); the damage is easily seen via loss of foliage and "droppings" located under the crown; insects regularly feed on leaves and normally damage is minimal except when outbreaks occur; in our region, some of the more common defoliating insects include: sawflies, forest tent caterpillar, variable oakleaf caterpillar, and leafminers.

Bark Beetles and Other Bark Borers – over 100 insect species fall into this very destructive category; adults excavate the sugar-rich phloem just under the bark where they lay eggs; larvae hatch and continue eating their way from the main gallery through many smaller galleries; in our region, some of the more common bark beetles include: southern pine and ips beetles, emerald ash borer, walnut twig beetle, flatheaded borers, and twolined chestnut borer.

Wood Borers – similar to bark beetles, wood borers mine deeper into the tree and damage the new wood (called sapwood or xylem); sometimes wood borers cause little to no damage (such as for overwintering purpose), while other times their galleries can sever the flow of water to the foliage and cause rapid mortality; fine sawdust (also called frass) is often seen on the bark and near the trunk; in our region, some of the more common wood borers include: ambrosia beetles, oak borer, and carpenterworms.

Terminal Feeders – this category of tree pests feed on buds or roots; a few even cause damage by girdling twigs; rarely is their damage lasting (unless repeated annually); rather they mostly deform the bowl and crown of younger trees; in our region, some of the more common terminal feeders include: Nantucket pine tip moth, pales weevil, twig borers, and girdlers.

Sucking Insects – insects that rob trees of their food by drawing fluids from the leaves and fine branches are sucking insects; rarely do they cause death but can spread tree diseases; in our region, some of the more common sucking insects include; aphids, woolly adelgid, scales, spittlebugs, and cicadas.

When attempting to identify forest/tree insects, it helps to first classify their feeding habit. Control is then made easier. Some insects, such as the emerald ash borer, are very serious threats and restrictions on movement of wood products exist.

Fazio, J.R. 1987. The Woodland Steward. The Woodland Press. Moscow, Id.

Prescribe Fire in Hardwood Forests

Wayne Clatterbuck, Professor, Forest Management and Silviculture *and*
Charles E. McGee, Retired Research Project Leader, USDA Forest Service, Sewanee, TN and Retired Executive Director for the Center of Oak Studies, University of Tennessee, Knoxville, TN

The purpose of this article is to consider the use of prescribed fire to achieve management goals in hardwood forests where the primary objective is to grow high-grade hardwoods. At the present time, we do not endorse the general concept of using fire in quality hardwood stands. Nor will we recommend the use of fire until certain questions are answered with properly conducted research studies. Some of these questions include: How can a mature stand of valuable hardwoods or an immature stand of developing hardwoods be burned without damaging the crop trees? How can fire be used to release desirable hardwood regeneration from competition without topkilling the desirable regeneration? What is a viable and proven oak regeneration prescription on productive sites using fire considering that most hardwoods sprout?

Prescribed fire has been used effectively and economically: to reduce fuel on the ground in pine stands (generally most hardwood stands do not have a fuel problem because of rapid decay rates of deciduous leaves), to control disease in longleaf pine, and to control unwanted competing hardwood vegetation in pine stands. Burning has been used successfully to enhance pine growth because burning effectively kills and controls hardwoods. Single fires will usually topkill most oaks under one inch in diameter. Additional fires will usually influence most understory hardwoods. Most of the widespread use of fire has been in pine stands or on sites soon to be planted in pine. A skilled burn specialist can slip a low intensity fire under a 10-year-old loblolly pine stand to reduce fuel, topkill oaks and other hardwoods without hurting the pine because of the thicker, more insulating bark of the pines.

In view of the great success with burning in pine, why have we not been able to repeat the practice on hardwoods? Hardwoods in general and oaks in particular have certain attributes that make it almost impossible to use fire in and around valuable oaks. Most hardwoods are highly susceptible to butt rot, especially from the *Armillaria* root fungus. Unfortunately, even a light burn with small fire scars will result in substantial increases in butt rot. Even when the rot does not kill the tree, it reduces tree vigor and value. To a great degree, improved hardwood management has resulted from keeping wildfire out of the woods!

Good hardwood regeneration occurs naturally following complete harvests/clearcuts of high-quality hardwood stands on good hardwood sites. However, it has been widely reported that oak regeneration has been difficult to maintain following any type of harvest. On good sites the oaks cannot compete with faster growing yellow-poplar, ash, red maple, black cherry and locust. A number of practitioners recognized that the wildfires that burned regularly 80 to 100 years ago must have influenced the formation of the fine, mixed hardwood stands we are harvesting today. Some of those practitioners developed a theory that prescribed fire might be used to favor the growth of oak seedlings and saplings over the growth of the competition.

In 1978, the USDA Forest Service, Southern Forest Experiment Station in cooperation with the Bankhead National Forest in Alabama initiated a study to evaluate how hot prescribed fires would impact 3 to 4 year old hardwood regeneration (McGee 1979). Four 10-acre tracts of the best hardwood regeneration on the forest were burned. The regeneration was well-distributed across the four tracts and included 300-400 yellow-poplar per acre that were 5-6 feet tall and many smaller ones, 100 ash, 75 cherry, 75 red maple, and 50 hickory, all averaging 5 feet tall. The total oak seedling component per acre (at least 5 feet tall) was 30 white oak, 25 northern red oak, and 15 black oak. There were a few oak stump sprouts resulting from the harvest. Prior to the fire, almost all red oaks were single stemmed about half of the other oaks were single stemmed.

The fires were set in the spring (2 sites), summer and fall with a 3-6 mph wind and in dry and sunny conditions. The fire crews were from the Ranger District of the National Forest and from the Southern Experiment Station. Burning a 4-year-old regeneration area requires patience, expertise, and hard work. Fuels were variable and required the fire crew to keep setting the fire to avoid leaving gaps. More than 95% of the areas were uniformly burned.

Almost all the seedlings and saplings were burned and topkilled except the larger stump sprouts. One year after the fire, about half of the oaks had resprouted, but vigor was variable and many of the oaks were multiple stemmed. The fires killed outright about half of the yellow-poplar and other stems. The ones that survived the burning were resprouts. Two years after the last fire, it was obvious that the surviving stand was going to be predominately a yellow-poplar stand with a few ash and black cherry, some red maple and a few oaks primarily from stump sprouts, not seedling sprouts. The oak seedlings that survived the fire appeared to be overtopped and crowded worse than before the fire. The obvious impact of the fires was a loss of four years of good growth which is more reason to keep fire out of hardwoods.

Advance regeneration, that is the regeneration that is in place and on the ground when the stand is harvested, can play an important role in the development of the future stand. How does burning impact advance regeneration? Let's consider a high-quality stand that is dominated by northern red oak, but is also stocked with other desirable species. Suppose that the stand has 50 red oak seedlings per acre that are well distributed over the area. However, yellow-poplar, ash, cherry, hickory, black locust and red maple are overtopping and crowding the slower-growing oak seedlings. The oaks urgently need release from the competition. Is prescribed fire a viable and successful option? A good, hot fire properly applied will topkill most of the competition and provide the release. However, there is a problem. Fire kills oak too! Fire will topkill almost all the regeneration including the oaks. About half of the oaks will resprout, but they will be mostly multiple stem sprouts of low vigor. The competition will also resprout, albeit at lower numbers, and overcome the resprouted oaks. Burning will also affect valuable crop trees if any are left after the harvest, causing fire scars and allowing the introduction of butt rot into the crop trees.

No one should undertake a program of prescribed burning on productive hardwood sites without full appreciation of the purpose, difficulty, and the risks involved with each burn. Burning in hardwoods is difficult! Fuels vary due to the species present in the overstory. Intensity of fire is difficult to control. Prescribed fire on slopes is very tricky. Fires will not start or carry on lower slopes and stream valleys because fuels are moist. Fires are tough to control on upper slopes and ridges because of dry fuels and high winds.

Fire is detrimental to and damages developing and mature high quality hardwood stems. Little direct evidence exists that burning perpetuates oak regeneration and its status in a developing stand. Our experience is that burning kills just as many or more oak seedlings and saplings than it perpetuates. Until there is direct scientific evidence that burning enhances oak regeneration to the degree that it can overcome other competition, we cannot recommend the practice. We are not aware of an oak regeneration prescription on good sites that uses prescribed burning where the growth and development of oaks is enriched in the long-term (more than 10 to 15 years) compared to competing species of yellow-poplar, black cherry, red maple and locust. Although there may be other purposes for burning in hardwoods such as creating habitat structure and browse for wildlife, burning damages standing hardwood stems and boles. Burning to regenerate oak has not been demonstrated with scientific rigor as an effective practice in hardwood forests.

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Citation
McGee, C.E. 1979. Fire and other factors related to oak regeneration. Pages 75-81 in Regenerating Oaks in the Uplands (H.Holt and B, Fischer, eds.). John S. Wright Forestry Conference, Purdue University, West Lafayette, IN.

Top Ten Family Forest Issues for 2015

Wayne Clatterbuck, Professor, Forest Management and Silviculture

The National Woodland Owners Association publishes the top ten issues that impact forest landowners in their *National Woodlands* quarterly publication each year. These issues are from a nationwide survey and may or may not be representative of individual states. The top 10 issues are listed below. For more specific information about these issues, reference the publication: National Woodlands, Volume 38, Number 2, pages 6-9.

1.Access to timber and wood products markets, biomass, and international fair trade.

2.Fair income, inheritance and property taxes

3.Impacts on forest health from invasive pests and species

4.Extension education and technical assistance by service foresters

5.Right-to-practice forestry and private property rights

6.Water quality and quantity from forests

7.Stewardship incentives through cost-sharing and tax credits

8.Keeping forests as forests

9.Wildfire: suppression, fuel reduction, early detection, and woodland fire insurance

10.Certification of loggers, foresters, and forest practices

Why Trees Die When Stressed: A Physiological Explanation

Wayne Clatterbuck, Professor, Forest Management and Silviculture

Stress in trees is caused by disturbances such as fire, disease or insect infestations as well as weather, especially droughts and flooding. Tree tissues produce and accumulate ethanol in response to many tree stressors. Ethanol provides the stressed tissues with a source of temporary and emergency energy when their normal source of energy from aerobic respiration is impaired by the stress. Respiration uses oxygen and sugars to generate energy and release carbon dioxide and water. If a tree does not get enough oxygen, or cells are damaged and respiration cannot occur, then the cells start to collapse. When animal (and human) muscles run low on oxygen, during periods of moderate or strenuous use, they synthesize and accumulate lactic acid until oxygen sources are restored. When tree tissues are stressed from lack of oxygen, they also produce lactic acid, but quickly switch to ethanol. The ethanol metabolic pathway allows the cells of trees to produce just enough energy to survive.

The ethanol becomes part of the internal water transport system of the tree and moves rapidly up the stem in the sapwood/xylem columns that supplies water to the leaves or needles. The ethanol is at low concentrations initially being diluted within the water pool of the tree. This allows healthy trees to survive brief periods of stress. However, as the ethanol concentrations accumulate and escape into the atmosphere, the increased concentration of ethanol from the tree is a signal to many insects that the tree is weakened or stressed and
easier to attack. These ethanol sensitive insects are opportunists detecting ethanol to find weakened trees that may not be able of producing as many defensive chemicals, such as oleoresins, to deter the insects.

The authors caution that not all pathogens lead to increased ethanol production. However, several examples are given in support of these findings. Tree tissues stressed by heat from fire or burning accumulate ethanol rapidly, and those containing the most ethanol attracted more wood-boring beetles than trees with lower levels of ethanol. Cankers caused by the sudden oak disease pathogen on the trunks of coast live oak trees contain more ethanol than tissue outside the cankers. Beetles sense the ethanol and attack the cankers. The tunnels bored by the beetles and subsequent decay increase stem fissures and shorten the life of the tree. Controlled greenhouse experiments simulating drought and monitoring ethanol production with tree seedlings of various species suggest that ponderosa pine was the most tolerant of drought with less ethanol production, followed by lodgepole pine, while Douglas-fir was the least tolerant, producing more ethanol. Severely drought-stressed pine attacked by bark beetles contained more ethanol than their unattacked neighbors in a study from Spain.

Keeping trees healthy and vigorous is essential for maintaining resilient forests with strong resistance to stress and disturbance. Knowing the potential relationships between stress, ethanol production, and pathogens may eventually assist managers in identifying vulnerable, stressed trees and develop measures to help the trees survive.

Reference: *Pacific Northwest Science Findings*, Issue 173, May 2015, USDA Forest Service, Pacific Northwest Research Station, Portland, OR

Managing Native Grass Forages
Continuous Grazing Native Grass Pastures

Patrick Keyser, Professor and Director, Center for Native Grasslands Management

Most recommendations for grazing native grass forages are based on some form of rotational grazing. That approach to native grass management and its benefits were discussed in an earlier 'Managing Native Grass Forages' article. However, continuous grazing may also be used effectively with native grasses. In fact, in the Great Plains where a great deal of native grass grazing occurs, this is a common practice. As is the case with rotational grazing though, the key to successful continuous grazing of native grasses is maintaining the proper canopy height.

Native grasses are tall growing and to remain vigorous they require maintenance of a higher canopy – especially under continuous grazing – than what is required by most other common forage species. For big bluestem and indiangrass, canopies should be maintained between about 15 - 20 inches tall throughout the summer grazing period. For switchgrass, canopies should be kept between 20 - 30 inches for lowland varieties such as Alamo and Kanlow. Eastern gamagrass heights should fall between that for switchgrass and the other natives, about 18 - 24 inches.

Under continuous grazing, maintaining canopy heights lower than those described above will result in weakened stands, reduced gains, reduced yields, and increased weed pressure. However, research conducted at the University of Tennessee and elsewhere has demonstrated that continuous grazing is a viable strategy – as long as minimum canopy heights are diligently maintained.

Two other cautions should be observed in continuous grazing with native grasses. First, do not allow the canopy to get too tall or the grass will get stemmy and unpalatable. In that case, grazing will be concentrated on the more heavily grazed portions of the pasture where the grass is shorter and more vegetative. If not corrected, the result will be patches that are overgrazed ('grazing camps') and others that have gone to seed and are not grazed at all. Of course, the key to managing canopies that are not too short or too tall is appropriate stocking. And this leads to the second caution for continuous grazing.

Native grasses grow rapidly during early summer and then slow down in mid- to late-summer. This is particularly true of switchgrass, but also occurs with the other species. You need to be prepared to make some adjustments in stocking during late June to ensure that you do not 'overshoot' the carrying capacity for the later part of the grazing season. Typically, stocking will need to be reduced by about one third during this time. Also, be sure to rest the stand after September 1 under continuous grazing.

Continuous grazing will allow you to effectively manage your native grass pastures with less time invested in moving cattle during the summer than is required under rotational grazing. However, you ***must*** still carefully monitor the condition of the pasture and be prepared to adjust stocking as needed (especially in late June). Remember, it's all about canopy height.

Managing Native Grass Forages

Hay Production with Native Grass Forages

Patrick Keyser, Professor and Director, Center for Native Grasslands Management

As is the case with most forages, timing of harvest for native grasses is very important. Harvesting at the boot stage will ensure the best balance between quality and yield. At this stage, crude protein content will typically be about 11 – 12% with big bluestem and indiangrass tending somewhat higher than switchgrass. Although hay feeding trials for native grasses are lacking, many producers have told me that their native grass hay is among the best that they have fed.

One challenge with native grasses is that they are less forgiving than cool-season grasses when it comes to late harvests. Harvesting more mature grasses (seedhead emergence) will result in greater yields, but lower quality and less palatable hay. However, ideal hay harvest dates for native warm-season grasses (boot stage) typically fall in late May/early June for switchgrass and mid- to late-June for bluestems and indiangrass. These dates typically provide weather more conducive to curing hay than is normal in early-May when cool-season grasses reach boot stage. This difference in timing can make it easier to harvest native grasses at the correct stage.

Because of the taller growth habit of native grasses, it is important not to harvest them too closely – leave an 8 inch residual height to maintain vigorous, productive stands. Using a "shoe" or "boot" on your mower (fabricated or purchased from your dealer) can enable you to consistently harvest at these greater heights. Repeated harvesting to lower heights will weaken stands, increase weed pressure, and reduce yields. Similarly, cutting hay late in the growing season (after late August) also can lead to weakened stands because such harvests remove so much plant energy just prior to fall dormancy.

Although a second cutting is possible with natives, typically in early- to mid-August, do not take two cuttings every year. Even with only one or two cuttings each year, native grasses can yield more than 4 tons per acre, well above what is typical for cool-season grasses. Producing the same amount of hay from fewer acres allows you additional land area for stockpiling cool-season grasses and/or grazing.

Native grasses do not need more than about 60 units of nitrogen per acre to achieve their high yields. Although we know that we are removing considerable amounts of both phosphorous (P) and potassium (K) when we harvest hay, most studies do not indicate a relationship between these nutrients and yield for native grasses. However, it is important to monitor soil in native grass hayfields and amend them whenever soil tests indicate low levels for either P or K.

Native grass hay can be produced at moderate costs (about 44% of the cost of cool-season hay) and can remain reasonably productive during drought conditions making them a valuable asset in a forage program. For more information, see UT Extension publications SP731-D (*Producing Hay from Native Warm-season Grasses in the Mid-South*). Both are available at https://utextension.tennessee.edu/publications/Pages/foragesLivestock.aspx or http://nativegrasses.utk.edu/publications/default.htm.

Managing Native Grass Forages
Cool Season Competition Control

Patrick Keyser, Professor and Director, Center for Native Grasslands Management

Cool-season weeds present substantial competition for native grass forages. If left unchecked, they can weaken warm-season natives and eventually take over the stand. Cool-season grasses have a place in a forage program, but that place is not within the warm-season grass stand! One or the other will dominate and the other will suffer.

Where fertility levels are higher than what is needed for native grass forage production, this competition can be especially severe. Native grasses, with the exception of eastern gamagrass, do not use much fertilizer. Thus, the first step in reducing cool-season weed pressure is making sure that you are not over-fertilizing native grasses. Given current – and forecast – fertilizer prices, this is a good step regardless.

Another important consideration in reducing cool-season weed pressure is to ensure that native grasses are not stressed. Hay harvests that are too late (after Aug 25 or so), too frequent, or too short (<8 inch residual height), or overgrazing can all lead to stressed stands that are more vulnerable to weed encroachment. This applies to warm-season and cool-season weeds. If you are seeing unacceptable levels of weed pressure, evaluate your canopy management to be sure you are not stressing the stand.

Where cool-season weeds do need to be controlled, it can be relatively simple because native grasses are dormant following frost in the fall. Thus, once the natives are dormant, broad spectrum herbicides can be used. For perennials, such as tall fescue and orchardgrass, use of glyphosate can be very effective during the fall. Spray once the natives are dormant but while the cool-season grasses are still actively growing – typically in November. In fact, this is the best time of year to control these species as far as effective and spray rates are concerned.

Broadleaf biennial and perennial weeds such as thistles and plantains can also be effectively controlled during late fall with 2,4-D or metsulfuron formulations. Winter annuals can also be controlled at this time of year or in March. For annuals, the broadleaf herbicides mentioned above can be used as can glyphosate. Burndown chemicals such as gramoxone can also be effective on annuals. Please keep in mind though, there is a 60-day restriction for grazing with gramaxone, so timing is important.

Another tool widely used in the Great Plains to control weeds in native grass stands is prescribed fire. Burning native grasses in late March or early April can be effective at removing annuals and suppressing perennials. Neither tall fescue nor orchardgrass will be killed by burning though. In fact, burning too early (before late March) can actually enhance these competitor's position in the stand.

Good management is the first step to reducing cool-season weed problems in native grasses. But winter dormancy provides a good opportunity to eliminate these weeds when they have become a problem. Left uncontrolled, they can weaken a native grass stand and reduce its vigor and production.

Wildlife Management Calendar for June/July

Craig Harper, Professor, Wildlife Management

Wildlife Notes

Black raspberries and mulberries ripen in early June

Wild plums ripen through June

Blackberries ripen in early July

Most white-tailed deer fawns are born in June. Do not pick them up, thinking they have been abandoned

Peak hatch for wild turkeys and bobwhites occurs in June. **DO NOT MOW** old-fields!

Ducks and geese molt in June and July and are flightless for a couple weeks

Initial nests of most songbirds have hatched in June and nestlings are fledging

Box turtle eggs hatch in June

Bullfrog breeding peaks in June and July

July is peak breeding season for black bears

July is also peak time for the second litter of squirrels

Lots of bobwhite poults using fields in July. **DO NOT MOW** early successional areas (old-fields)**!**

Grassland songbirds incubating second nests of season in July

Habitat Management

DO NOT MOW old-fields!

- destroys cover for wildlife at a time it is needed most (nesting and raising young)
- stimulates grass and leads to reduced forb cover (which means less food and cover)
- increases thatch at ground level and makes travel through the field much more difficult for wildlife
- manage old-fields by burning or disking in late March/early April; **don't mow them**!
- to reduce woody encroachment, consider burning fields in late August – early October
- refer to Chapter 6 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information on managing early successional areas

Instead of mowing early successional areas, spot-spray undesirable plants instead

- this is a great method to improve the composition and structure of early successional areas; it works really well
- drive across field with tractor and sprayer as you would when mowing; spot-spray undesirable species with a spray gun as you see them
- composition of field will change over time, developing into an early successional area with desirable plant species
- Roundup and other glyphosate products work well
- Garlon 3-A and Cimarron work well for undesirable broadleaf plants, such as sericea lespedeza and curly dock
- Roundup, Garlon, Arsenal, Cimarron, and PastureGard are good herbicide options for woody competitors, such as sweetgum, red maple, green ash, privet, and multiflora rose

Finish planting native warm-season grasses and associated forbs by early June

- plantings through mid-June will do fine with adequate rainfall later in the month
- existing sod should have been killed before planting
- use a preemergence herbicide (imazapic) when planting bluestems and indiangrass
- plant seed **no deeper** than ¼ inch
- be patient!
- refer to Chapter 5 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information on establishing native grasses and forbs

Plant firebreaks and other disked strips not left for natural vegetation by early to mid-June

- iron-clay cowpeas, soybeans, grain sorghum, Egyptian wheat, and various millets provide forage and seed for a variety of wildlife species
- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for seeding rates and additional information

Plant warm-season food plots

- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for planting recommendations

Burn unharvested wheat fields that have been left standing for doves in late June/early July

Plant Japanese millet around beaver sloughs and other areas that will be flooded in fall for ducks

Mow and spray perennial forage food plots for weed control if necessary

- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for specific herbicide and management recommendations

Collect soil samples for testing from plots to be planted this fall and lime now as needed

Establish salt/mineral licks for white-tailed deer

- realize mineral licks have not been found to increase antler size, body weights, or reproduction
- trace mineral salt licks may increase visitation to sites that will be used later for infrared-triggered camera surveys

Construct/repair dikes and water-control structures for flooding fields/woodlands for waterfowl this fall/winter

Wildlife Damage/Population Management

Leave young wildlife alone

- let nature takes its course; you'll do more harm than good by trying to save "orphans"

Do not allow pet cats outside; report all feral cats to the animal shelter for immediate removal

- putting a bell around a cat's neck does not keep it from killing birds and young rabbits and squirrels
- house cats are not natural predators as they are not native to North America

Put up chicken-wire fence at least 6 inches belowground and 2 feet aboveground around vegetable gardens to repel rabbits

Put up a 2- or 3-strand electric fence (one strand 6 inches above ground and the other 6 inches higher) to keep groundhogs and raccoons out of vegetable gardens

To repel deer from vegetable gardens, erect a single-strand electric fence (2 ½ feet above ground) with aluminum tabs attached every 3 – 5 feet. Smear peanut butter on the aluminum tabs. Deer are attracted to the peanut butter; however, when they touch the aluminum tabs with their mouths, they learn to stay away.

Plant "alternative" forages (such as iron-clay cowpeas, buckwheat, and clovers) for wildlife on the outside of fencing around a garden to satiate the appetite of deer, groundhogs, and rabbits, further helping to keep them out of the garden.

Nuisance crawdads in the yard may be remedied by pouring boiling water down the spout of the mound

To keep bats out of attics and out from under vinyl siding and other areas, close or cover up all holes and cracks so they can't get in!

- do this at night after bats have left the roost; it may be necessary to open the hole the following night to allow any bats that were trapped inside a chance to leave
- maternal colonies will migrate to hibernation sites in the fall. If you wait until then to close holes and cracks, you will avoid trapping any inside.

"Repel" snakes by cleaning up around the house – mow more often, remove piles of wood, brush, and trash – to repel rodents that attract snakes. There is no reliable "repellent" for snakes; only "snake oil."

The best way to get rid of moles is by trapping, but you have to set the traps ***correctly***!

Keep crawl spaces and other entrances to houses and buildings closed to prevent young skunks from entering

Refer to *Managing Nuisance Animals and Associated Damage Around the Home*, PB 1624, for additional information on wildlife damage management

FWF Update Newsletter is published bi-monthly by The University of Tennessee Institute of Agriculture, Department of Forestry, Wildlife and Fisheries. Send comments and suggestions to mwright@utk.edu.

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