

Kentucky
Woodlands
Magazine

Volume 3 Issue 2
August 2008

**Selective Harvesting Part One
Build Your Own Wetland
Tribute to Tim McClure and David Maehr**

Kentucky Woodlands

Volume 3 Issue 2 Magazine

Promoting stewardship and sustainable management of Kentucky's non-industrial private forests.

In this Issue...

Selective Harvesting	1
Environmental Education	4
Common Concerns About Using Wood for Energy	6
Build Your Own Wetland	12
UK Forestry Extension	16
In Honor of Tim McClure and David Maehr	19

Departments:

Forest Health	8
KWOA	10
Forestry 101	18
Kentucky Big Tree Program	20
Test Your Knowledge	21
Non-Timber Forest Products	22
Kentucky Woodland News To Use	24

From the Editors of the Kentucky Woodlands Magazine:

The forestry and natural resource community has suffered the loss of two significant individuals since our last issue. Tim (Thomas) McClure, forest health specialist for the Kentucky Division of Forestry and Dr. David Maehr conservation biology professor with the University of Kentucky Department of Forestry were lost to us unexpectedly. This issue is dedicated to these individuals and the cover of this magazine that is turned on its side is representative of our feelings in the wake of these tragedies. Both of these individuals can not be replaced and while certainly the forestry and conservation communities will endure in part because of the vestiges of their work the loss is significant and ultimately our natural resources are in less secure hands today. Please turn to page 19 and take time to pay homage to these individuals.

While the articles that are contained in this issue were decided upon months in advance of their passing it is interesting to note that several of the key articles focus on aspects of forest health and wildlife conservation and diversity. This is certainly an indicator of the importance of the subject areas that Tim and Dave contributed to and their importance to the health and ultimate sustainability of Kentucky's woodlands.

On behalf of the Kentucky Division of Forestry and the University of Kentucky Department of Forestry we thank you for your stewardship of Kentucky's woodlands and hope that you can use the information contained in every issue of this magazine to improve the sustainability of your woodlands and ultimately our forests and wild areas.



Jeff Stringer,
University of Kentucky
Department of Forestry



Diana Olszowy,
Kentucky Division of Forestry

About the Covers:

Dave Maehr, professor of conservation biology with the University of Kentucky Department of Forestry, provided the cover photo of a woodland road at Robinson Forest. Robinson Forest is managed for research, teaching, and extension education by the University of Kentucky's Department of Forestry, it is one of the largest research and educational forests in the eastern United States totaling 14,800 acres located on the Cumberland Plateau in southeastern Kentucky. For more information about Robinson Forest, visit www.ca.uky.edu/forestry/robfor.php.

Back cover photo courtesy: Kentucky Forest Leadership Program

Managing Editors:

Jeff Stringer
Cooperative Extension Service
University of Kentucky
Department of Forestry

Diana Olszowy
Kentucky Division of Forestry

Associate Editor:
Billy Thomas
Cooperative Extension Service
University of Kentucky
Department of Forestry

Assistant Editor,
Advertising & Graphic Designer:
Reneé Williams
Cooperative Extension Service
University of Kentucky
Department of Forestry

Proofreading and Web Support:
University of Kentucky
Agricultural Communications Service

Volume 3 Issue 2

Kentucky Woodlands Magazine is published under the direction of the University of Kentucky's Department of Forestry Extension and the Kentucky Division of Forestry and is sponsored by the Kentucky Forest Stewardship Coordinating Committee. Kentucky Woodlands Magazine is supported by funds from the Kentucky Forest Stewardship Program, U.S. Forest Service, Renewable Resources Extension Act, and the Cooperative Extension Services. Views and opinions expressed in the Kentucky Woodlands Magazine do not necessarily represent the opinions of its editors, the UK Department of Forestry or the Division of Forestry. The appearance of a logo, organization, manufacturer or product within the magazine does not constitute an endorsement by the editors, the University of Kentucky Department of Forestry or the Kentucky Division of Forestry.

Change of Address and Other Magazine Business:

Forestry Extension Office,
Department of Forestry,
University of Kentucky,
216 Thomas Poe Cooper Bldg.,
Lexington, KY 40546-0073
859.257.7597
E-mail: billy.thomas@uky.edu
www.ukforestry.org

Duplicate mailings:
For duplicate mailings, please
send both mailing labels to the address above.



Forestry Extension Office
Department of Forestry
216 Thomas Poe Cooper Bldg.
Lexington, KY 40546-0073
859.257.7597
www.ukforestry.org



Kentucky Division of Forestry
627 Comanche Trail
Frankfort, KY 40601
502.564.4496
www.forestry.ky.gov

Photo courtesy: Thomas R. Biebighauser



SELECTIVE HARVESTING

PART ONE: SUSTAINABLE MANAGEMENT OR HIGH-GRADING?

by Jeff Stringer

Note: This is the first of a two-part series that explores the sustainability of selective harvesting. The first part outlines the difference between a sustainable selective harvest and a high-grading, which is a form of selective harvesting most prevalent in Kentucky. The second part of this series outlines how to determine if your timber marking strategy is sustainable and part of a good long-term management strategy.

Most woodland owners are averse to harvesting a large percentage of their overstory trees. Because of the drastic change in aesthetics and the issues that arise from very intensive harvests over entire woodlands, many owners prefer the idea of a selective harvest. Unfortunately, the term selective harvest is almost meaningless. In essence, it means that not all of the trees will be cut. However, it does not indicate what species, size, number, or quality of tree is to be left. Because of this vagueness, it is not a term normally used by foresters in technical discussions. When

responding to the question, “If you had one word to describe to landowners the type of harvesting you do, what would it be?” more than 1,400 loggers in the Kentucky Master Logger program overwhelmingly used the term selective. Upon deeper enquiry, it was found that this meant everything from a commercial clearcut, where only small or unmerchantable trees are left, to a high-grade where only the best trees are removed.

So the question “Is selective harvesting good or bad?” is an important one, and the answer needs to be thoroughly understood if woodland owners are to make good decisions about developing a timber harvest that ensures long-term sustainability.

One of the biggest plagues to sustainable hardwood timber production is high-grading. This practice is often done under the banner of a selective harvest. High-grading is defined as a harvest that removes only high quality and value trees while leaving lower quality trees to occupy valuable growing space. When high-grading occurs several times to a stand, it can result in a long-term loss of value that is hard to regain.

This woodland was just harvested as part of a thinning to improve quality hardwood production. Note the many straight undamaged trees and the limited amount of ground disturbance, tops, and debris. This is an excellent example of a controlled selective harvest. Lower left image: Harvester used to thin this hardwood stand. Photos courtesy: Jeff Stringer





Once high quality trees are mature they need to be harvested to maximize timber revenues. Note that the tree being cut is marked and this harvest was designed to carefully remove the mature sawtimber trees and low grade trees to ensure room for good growing stock.

and few markets for lower grade trees. If your hardwood forest is selectively cut based on markets for grade sawlogs only, there is an extremely good chance that the harvest is a high-grading. A study in Kentucky indicated that approximately 60 percent of the harvests occurring during the late 1990s were high-gradings (see Figure 1). This situation is not uncommon for hardwood forests in many states in the East. Unfortunately, repeated high-grading has been shown to reduce the standing value of hardwood forests to approximately one-fourth to one-tenth of the potential value that could be obtained through the use of silviculturally sound harvesting practices. Since the initial harvest of the state's hardwood forests, limited or nonexistent markets for low-valued hardwoods have resulted in second and third cuts that were high-grades. While the development of low grade hardwood markets have helped reduce high-grading, the practice is still common.

It remains common in Kentucky because economics and to some degree tradition, push loggers and landowners to high-grading. In some areas, the only strong markets that exist locally are for quality sawtimber logs. In this case, true economics are driving high-grading. In some instances high-grading is done because individual timber buyers and/or loggers have traditionally cut high quality trees and have developed their operations to efficiently harvest and market only high quality logs. In these cases their ability to efficiently harvest lower quality trees is limited. Some loggers have learned to harvest lower grade material. This is accomplished either by improving their ability to harvest large quantities of low quality wood for markets such as pulpwood or by processing the low grade material themselves into a value added product. In some instances loggers have developed reduced overhead costs that allow them to live with the lower profit margin associated with harvesting and selling low grade logs. Even in bottomlands, where highly mechanized logging operations are possible, high-grading, under the guise of selective cutting, is still common. In many cases, many landowners yield to economic pressures associated with high-grading and "mine" the current and future growth of high-quality trees from their lands. Unfortunately, there are few forests that can withstand repeated high-grading.

Problems with High-Grading

High-grading has several harmful effects. First, it removes the better quality stems, leaving growing space to be occupied by poorly formed trees or species of low timber value.

Second, high-grading, like any type of light selective cut, limits the amount of sunlight reaching the forest floor, resulting in the long-term development of regeneration from shade-tolerant species such as red and

Generally, high-grading is regarded as the fastest way to ruin the sustainability of a hardwood forest.

A diameter-limit harvest is also a type of selective harvest. In this type of harvest, only trees above a specified diameter are cut. A large majority of landowners and loggers believe that diameter-limit harvests are the best in the long run for hardwood stands. This perception is common because many believe that the small diameter trees are younger and will eventually grow into large, valuable trees. This may or may not be the case (see discussion on size and age below). If a diameter-limit cut results in only small, old, low vigor and low quality trees being left, this type of harvest is as unsustainable as high-grading and it is not uncommon for high-grading and diameter-limit cutting to be categorized together as unsustainable practices. There are instances where trained foresters can prescribe a diameter-limit harvest that will improve woodlands, but only if enough young, vigorous, and potentially high valued trees are present and can be left undamaged after harvest of the larger trees.

Unfortunately, the practice of high-grading is widespread and results from readily available markets for high-quality grade sawlog and veneer trees

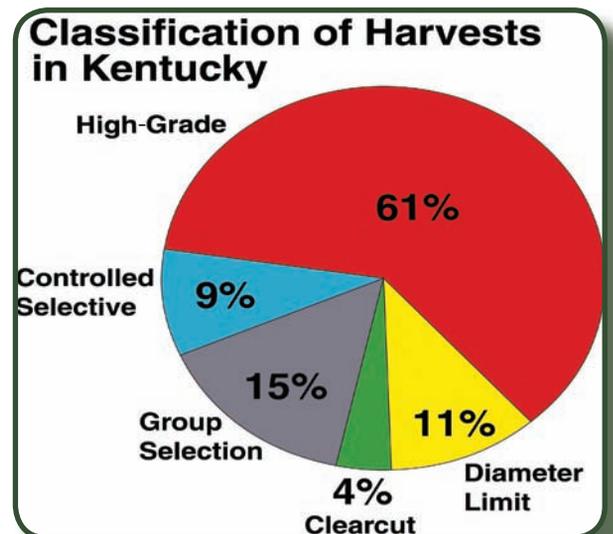


Figure 1. Timber harvest classification in Kentucky.

sugar maple, American beech, and various species of hickory. Even though there is nothing inherently wrong with these species, their presence reduces the successful regeneration of species needing full or moderate sunlight to regenerate and grow vigorously such as oak, ash, walnut, and yellow-poplar.

A third problem results from the perpetuation of small, old, low-vigor trees. Often smaller trees are left, with the idea that these trees are young and can grow rapidly into sawtimber-sized trees. In fact, small sapling to pole-sized trees in many hardwood stands are close to the age of the large overstory trees and cannot be relied upon to respond successfully to increased growing space after a harvest. Leaving these small but old trees further reduces the volume and quality yield of the forest.

Finally, the repeated entry at 10- to 20-year intervals that is typically associated with high-grading can be detrimental to the stem form of regenerating trees, especially if a limited number are present. High-graded forests are thus degraded, not only through the reduction of a valuable overstory but through a loss of valuable regeneration. Figure 2 shows the effect of repeated high-grading on a typical hardwood forest initially stocked with a high quality overstory of oaks and yellow-poplar.

Options to High-Grading

What can be done? One obvious remedy to break the cycle of repeated high-grading is to use a type of silvicultural system and harvest that initiates generation of a new age class that is capable of growing into high-quality, valuable trees.

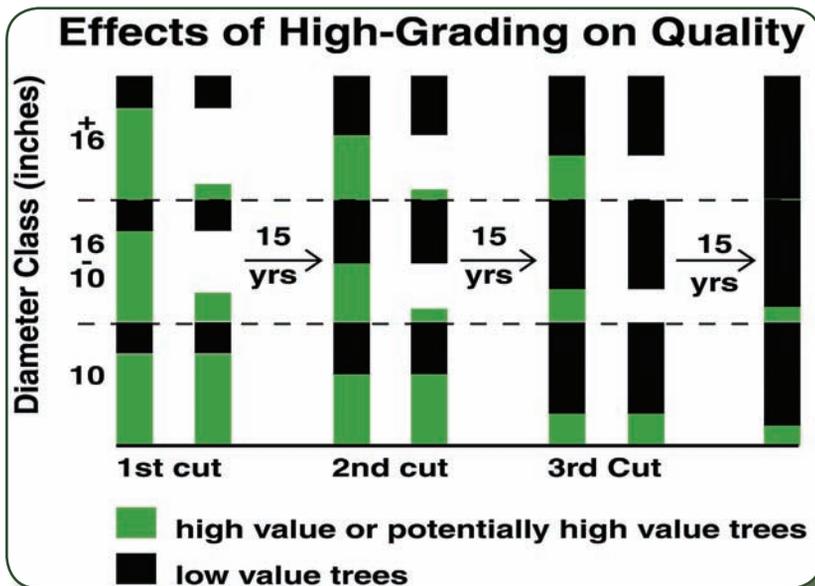


Figure 2. This diagram shows the adverse effect of high-grading on stand quality and value. In this example, the initial stand is composed of a large number of high-quality or potentially high-quality trees in all size classes as indicated by green segments in the first bar. When the first high-grading occurs, the majority of the valuable trees greater than 16 inches are removed as well as the better-quality medium-diameter trees 10 to 16 inches in size. The remaining high-quality trees as well as the low-quality trees grow in volume until the next high-grading. However, the percentage of high-quality trees is less in 15 years than was initially present. Unfortunately, due to the shade on the forest floor and damage to the regeneration, the forest is not able to develop potentially high-value regeneration that is able to replenish the overstory. This cycle is repeated until both the overstory and the regeneration are dominated by poorly formed stems or species of low value resulting in a highly degraded forest.

In situations where high-grading has left an entire stand or woodlands significantly degraded, clearcutting or a similar treatment can be recommended. However, there are many cases when the use of clearcutting is not an option.

If selective harvests are to be attempted, it is imperative that a forester be employed to develop a harvest that is not exploitive. Analysis of the woodlands will determine the age and size of quality trees in the stand and the status of the regeneration, and those factors will indicate the type of silviculturally based harvest that is needed. For example, group selection, small patch, a two-age deferment harvest, or a shelterwood harvest might be prescribed if regeneration within the stand is needed. If regeneration is not required, the forester will prescribe an improvement harvest ensuring that a significant amount of lower-quality material will be marked for harvest along with any good quality mature timber. This job can be difficult in stands that have been degraded and where limited markets for low-grade timber exist. Regardless, a professional forester is required to prescribe and mark successful harvests. Without a professional forester's assistance, selective cutting in many of our hardwood stands can easily result in degrading and a loss of sustainability.

About the Author:

Jeff Stringer, Ph.D. is a hardwood extension specialist at the University of Kentucky and is responsible for continuing education and research in hardwood silviculture and forest operations. He is also an editor of the Kentucky Woodlands Magazine.

Cooperative Extension Service, Department of Forestry, University of Kentucky, 213 Thomas Poe Cooper Building, Lexington, KY 40546-0073; E-mail: stringer@uky.edu; Phone: 859.257.5994; Fax: 859.323.1031.

Environmental Education: Opportunities for Kentucky's Youth

by Lynn Brammer and Jennifer Turner

Kentucky offers a variety of opportunities in environmental education ranging from instructional materials to organized programs. Although most educators are familiar with these opportunities, many would like more information to determine whether or not the activity would benefit their students or children. One of the best sources for locating environmental materials, programs, and information is through the Kentucky Environmental Education Council (KEEC). KEEC provides a network for these types of resources on its Web site that can be viewed at <http://keec.ky.gov/index.htm>. The site includes several links to forestry education resources that promote forestry in a fun, kid-friendly way.

Envirothon, Forestry Leadership Program, Future Farmers of America (FFA), and 4-H are a few of the programs in Kentucky that help students learn more about forestry. Canon Envirothon is an annual competition in which winning teams compete for recognition and scholarships by demonstrating their knowledge of environmental science and natural resource management. The teams, each consisting of five high school-aged students from participating U.S. states and Canadian provinces, exercise their training and problem-solving skills in a competition centered on four universal testing categories such as forestry, aquatic ecology, wildlife, soils/land use, and current environmental issues. Kentucky has been participating in Envirothon since 1999. Check out the national Web site at www.envirothon.org/about/what.php or the Division of Forestry's Web site at www.forestry.ky.gov/programs/education/kyenvirothon.

A similar opportunity to Envirothon is through the Kentucky Future Farmers of America (FFA). The FFA sponsors a competitive event that tests students' skills and knowledge in the area of forest management. This event helps FFA members apply the lessons taught in the high-school agricultural education/agribusiness class to real-life situations. To find out more about Kentucky's FFA program, visit its site at <http://kyffa.org>.

The Kentucky Forest Leadership Program, which began more than 50 years ago, is perhaps the most comprehensive forestry program offered to high-school students. The program is designed for students completing their sophomore and junior years. This camp provides hands-on training in surveying, soil sciences, wildlife habitat, wood products, and overall forest management. During the week, students are assigned an 80-acre forest in which they must determine land use and proper management. Professional forest and natural resource managers from the University of Kentucky, Kentucky Division of Forestry, Kentucky Department of Fish and Wildlife Resources, USDA Forest Service, and private forest industry provide training and support. For further information on this program, contact Doug McLaren at 859.257.2703 or e-mail dmclaren@uky.edu.

Kentucky 4-H Youth Development offers programs for students from elementary to high school and is specifically designed for students ranging from ages 9 to 19. There are 4-H forestry projects for both juniors and seniors that may result in materials for county and state fair judging—leaf collections, leaf prints, and educational displays of several types. Forestry field days are also held for junior 4-H'ers. The field days offer instruction and testing in tree identification, tree measurements, and compass and pacing. These field days usually occur in September and are located all over the state. A similar instructional program is held for senior 4-H'ers in which a three- or four-person team is selected for the National 4-H



Students learn to determine their pace for measuring distances in the forest.

Photos courtesy: Renee Williams



Students learn how to measure the height of a tree by using a Biltmore stick.

Forestry Invitational, held every summer at the Jackson's Mill 4-H Camp in Weston, West Virginia. In addition to the three topics given to the juniors, the seniors are also tested in forest health (insects and diseases), forest evaluation, topographic maps, and a forestry quiz bowl. Instructional materials for the senior program may be obtained from the Department of Forestry at the University of Kentucky, or on the Invitational Web site at www.aces.edu/n4Hfi/. Information on forestry 4-H programs is available at any county Cooperative Extension office. Teachers might also be interested in the 4-H Virtual Forest. This program, created by Virginia Cooperative Extension, provides youth with an interactive Web-based learning experience that introduces the concepts of forest management to youth ages 9 to 13 (www.ext.vt.edu/resources/4h/virtualforest/).

A final recommendation for teachers is one of the best-known forestry programs available. The program, which can be used by formal and non-formal educators, is Project Learning Tree (PLT). PLT is designed for and by educators working with students in pre-kindergarten through grade 12. PLT helps prepare students to make informed decisions about conservation practices and natural resource use by practicing problem solving and critical thinking skills. For more information on PLT workshops and programs, visit the Kentucky Division of Forestry's Web site at <http://www.forestry.ky.gov/programs/education/plt/>. Teachers should also encourage their students who show an interest in forestry to visit the "Just for Kids" Web page at www.forestry.ky.gov/kids/.

About the Authors:

Lynn Brammer is an Environmental Education Section Supervisor with the Kentucky Division of Forestry.

Kentucky Division of Forestry, 627 Comanche Trail, Frankfort, KY 40601; E-mail: lynn.brammer@ky.gov; Phone: 502.564.4496; Fax: 502.564.6553.

Jennifer Turner is an Environmental Education Specialist, Kentucky Certified Environmental Educator with the Kentucky Division of Forestry.

Kentucky Division of Forestry, 627 Comanche Trail, Frankfort, KY 40601; E-mail: jenniferl.turner@ky.gov; Phone: 502-564-4496; Fax: 502-564-6553.



Photo courtesy: Kentucky Forest Leadership Program

A student learns how to measure a tree using a Biltmore stick.



"Win with Wood" Reveals a Forest of Possibilities to Youth

Photo courtesy: Carroll Fackler

by **Katie Pratt**

The University of Kentucky Robinson Station's "Win with Wood" day-long program provides east Kentucky youth an opportunity to explore the area's forest industry and possibly earn money for college.

Carroll Fackler, UK forestry research specialist, began the program several years ago as a recruitment tool for the Hazard Community and Technical College's forestry program. When that partnership ended, many area 4-H agents remembered the competitions and asked Fackler to revamp the program for youth. He said young people do not realize forest industries are one of the top industries in the state and vital to the economy of eastern Kentucky, which largely depends on natural resources, such as coal and forestry, to generate income.

The day includes an assortment of contests, demonstrations, and information for youth ages nine to 18. Young people from area 4-H clubs, FFA, and agriculture classes compete in events such as compass and pacing, wood identification, tree identification, soil judging, and identification of invasive plants. Youth can submit individual and team wood-working projects for judging. The program not only exposes young people to the industry but also provides a chance for industry members to learn about the skills area youth possess. Representatives from major and area forestry companies are on hand to speak with students during the event about careers in forestry and ways the industry affects their lives.

While this program is in eastern Kentucky, individuals from other areas of the state who are interested in forestry and the program are invited to participate. There will be hands-on demonstrations, games, and prizes. The Kentucky Forest Industries Association and its members sponsor a \$500 UK College of Agriculture scholarship to the individual who accumulates the most points in the competitions. "Win with Wood" events begin at 9:30 a.m. Oct. 16 at the Wood Utilization Center at Robinson Station.

For more information on "Win with Wood," contact Carroll Fackler at 606.666.2438, ext. 235, or visit the UK Wood Utilization Center's Web site at www.ukwoodcenter.net.

About the Author:

Katie Pratt is an Editorial Officer in UK's Agricultural Communications Services. She produces news stories and features.

Agricultural Communications, 131 Scovell Hall, Lexington, KY 40646; E-mail: katie.pratt@uky.edu; Phone: 502.564.4496; Fax: 502.564.6553.

COMMON CONCERNS ABOUT USING WOOD FOR ENERGY

by Terry Conners

Sometimes it seems as though fuel costs for transportation and heating/cooling will never stop climbing, and it's only logical to look around for more efficient cars, furnaces, air conditioners, and water heaters. These measures will save us all money in the short term, but is there a way to achieve lower energy costs by taking greater advantage of home-grown fuels like coal or wood? Coal is a well-known, relatively inexpensive energy source for Kentuckians, but expansion of coal use has been criticized by some because of concerns about the environment and global warming. Does wood have the potential to supply energy for Kentuckians? Does using wood for fuel have a downside? This article addresses some of the questions from people all around the commonwealth.

Question 1:

How does wood fuel compare to coal and natural gas in terms of environmental impact and price?

Environmental considerations are different for coal, natural gas, and wood. Coal-fired power plants require air pollution control devices to keep sulfur dioxide and mercury compounds out of the air. In contrast, natural gas and wood emit negligible amounts of sulfur dioxide and mercury when they are burned, and they tend to produce smaller amounts of nitrogen oxides and carbon monoxides than coal. Ash from burned wood contains minute amounts of metals from the soils in which the trees were grown, but studies have shown that ash disposal does not present any environmental problems or concerns about uptake of metals in vegetation.

The cost of fuel wood depends on the local market demand for pulp wood and manufacturing by-products, as well as harvesting and transportation costs. Generally, however, wood compares favorably on an energy unit per dollar basis. Based on regional market prices available as this article is written (June 2008) and nominal boiler efficiencies, fuel costs exclusive of delivery are approximately as follows:

- Wood fuel, roundwood (not split, chipped, dried, or made into pellets)—\$3 per million BTUs at 68 percent boiler efficiency;
- Natural gas—\$13.35 (based on the commercial rate) per million BTUs at an efficiency of 85 percent;
- Appalachian coal—\$5.20 per million BTUs at 85 percent boiler efficiency.

Obviously there will be additional processing costs associated with chipping or grinding wood into a form that can be used for fuel, but wood appears to be competitively priced

and may be more economical than customary fuel sources in Kentucky.

Many people in Kentucky want to see us continue to use coal for power, and there are political and economic pressures for us to expand coal's use and even to turn local coal into liquid fuels. However, because of Kentucky's coal heritage and the coal-handling infrastructure that already exists, wood is not likely to replace coal based on economic reasons alone at the present time. If coal prices continue to escalate compared to wood prices, this situation might be more open to change.

Question 2:

Doesn't burning wood put carbon dioxide into the air the same as other fuels?

Wood, coal, and natural gas are all made of carbon-based compounds, and burning any of them releases carbon dioxide into the atmosphere. The difference between burning coal, natural gas, or trees, however, is that when trees sprout or are replanted after harvesting operations, each new tree will absorb the same amount of carbon during its lifetime as the tree it replaced; there is no net increase in the amount of carbon in the atmosphere when wood or other biomass is burned. Whether wood decomposes naturally or burns, it releases the same amount of carbon. Burning coal or natural gas, however, releases fossilized carbon that has been out of the earth's ecosystem for millions of years. This "old" carbon, when added to the atmosphere, is thought to be responsible for a changing global climate.

Question 3:

Will a wood energy power plant produce a lot of air pollution?

Burning wood in uncontrolled conditions can release minute particles into the air, causing a haze and respiratory irritations. This has happened in the past during times when energy prices rose quickly and before residential wood stoves were constructed to minimize these sorts of problems. Unlike burning wood in a fireplace or uncontrolled wood stove, however, modern wood-burning power plants control the combustion temperature, the moisture level, and the size of the wood particles, all of which reduce air pollutants. In addition, air emission controls capture and filter combustion gases and particulate air pollutants. These processes greatly reduce the amount of pollution produced by commercial wood-burning facilities.



Question 4:

If we use wood for electricity, will we consume all our forests?

Unlike fossil fuels, wood is a renewable resource. With proper management, local forests can readily produce enough wood to replace 10 percent of the fuel required by a coal-fired power facility. More wood could actually be made available in some locations (particularly if intensively managed “energy farms” are planted with trees), but a goal of replacing 10 percent of the coal used in Kentucky power plants is a practicable objective for some companies. With the exception of equipment to make wood fuel a uniform and suitable size, replacing this relatively small amount of coal fuel with wood does not require major modifications of the power-generating plants, and at the same time, it reduces the amounts of nitrogen and sulfur compounds emitted by coal-fired generators. This helps keep the cost of EPA-required pollution control equipment down and maintains a low cost of energy for Kentuckians. Using wood for energy may actually help maintain forests by increasing their economic value.



Wood pellets are an easy way to handle wood fuel in the home.

Photo courtesy: Sarah Ashton, www.southernbioenergy.net

Question 5:

If we use wood for fuel, will we deplete the forest of all its nutrients?

It is possible to reduce soil nutrients over time through intensive agriculture if nutrients are removed faster than they are replaced. However, most of a tree’s nutrients are contained in the leaves, not the wood. The removal of wood from a forest removes only about 4 percent of the nutrients that a crop of corn would, and it only happens once every 75 years or so (not every year as for corn), depending on how often timber is cut. Nutrient depletion is not normally going to be a problem.

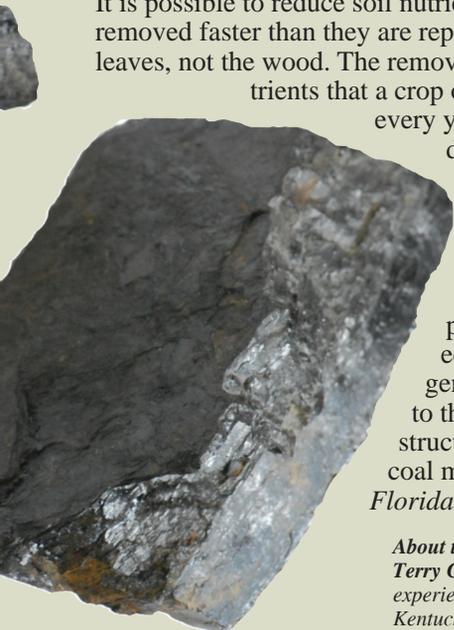


Photo courtesy: Terry Conners

Summary

Wood has the potential to replace some of the fuel in coal-fired power-generating facilities. It is economical and low in pollutants, and it does not contribute to environmental concerns about carbon additions to the atmosphere. The inclusion of wood as part of a coal-fired power plant would actually help to reduce air pollutants and the cost of air pollution control equipment. However, even though wood could be an economical alternative to coal for power-generating facilities in Kentucky, it is unlikely that it will replace coal in large percentages due to the culturally and economically embedded supply chain and the existing coal-handling infrastructure. If coal prices continue to rise compared to wood prices, the substitution of wood for coal might become more flexible. *(Thanks to Martha C. Monroe and Richard Plate, University of Florida for their contributions to this article.)*

About the Author:

Terry Conners, Ph.D. is an associate extension professor at the University of Kentucky Department of Forestry and has experience working with the pulp, paper, and wood industries as well as youth education. Current interests include assisting the Kentucky forest industry, youth education, and assisting homeowners with wood identification and wood related problems.

Cooperative Extension Service, Department of Forestry, University of Kentucky, 202 Thomas Poe Cooper Building, Lexington, KY 40526; E-mail: tconners@uky.edu; Phone: 859.257.2463; Fax: 859.323.1031.

Above photo: Burning coal releases fossilized carbon that has been out of the earth’s ecosystem for millions of years. This “old” carbon, when added to the atmosphere, is thought to be responsible for changing global climates.

Photo courtesy: Terry Conners



A monument honoring coal stands in Baxter, KY. Maybe someday there will be one for trees!

Forest Health



Invasive Plant Hit List: Japanese Stilt Grass

by Jeff Stringer

Japanese stilt grass (*Microstegium vimineum*), also known as Nepalese browntop or by its genus name of *Microstegium*, is a sprawling annual grass that is common to disturbed sites throughout Kentucky. It is native to Japan, Korea, China, Malaysia, and India. It was first reported in the United States in the early 1900s initially in Knoxville, Tennessee, in 1919, and in the 1930s in Virginia, North Carolina, Alabama, Kentucky, and Pennsylvania. The most probable means of introduction was from its use as a packing material for china and other fragile products from Asia. This species is now a common invasive exotic throughout the eastern United States and the South.

The species spreads by seed. It flowers in late summer, and the small, abundant seeds can float and readily move with wildlife. It normally establishes on disturbed areas, both natural and manmade, and can tolerate a range of soil conditions. However, it is most abundant and aggressive in moist environments such as bottomlands, north-facing slopes, coves, or any moist soil environment. Unfortunately, this species can establish and maintain itself in the shade, responding with vigor to increased light if an opening in the forest canopy occurs. It can grow to form thick mats up to 3 and 4 feet in height and has the ability to smother other ground cover and even lodge newly planted trees on moist sites. Forest roads, trails, regeneration openings, rights-of-way, and stream banks are all likely candidates for invasion.

Identification and Life Cycle

This species does not have long blades like fescue or other common lawn grasses. It more resembles a small delicate bamboo, having pale green 1- to 3-inch lance-shaped leaves that emerge alternately from a branched stalk. The off-centered midrib of the

leaves has a pale, silvery strip of hairs along the midrib. The flowers of this annual grass produce 1- to 3-inch-long seed heads in September and October. The seeds stay alive for up to five years in the soil, building up a considerable seedbed. Look-alikes include perennial whitegrass (Virginia cutgrass), a native species, and lady's thumb (*Polygonum persi-*

Japanese stilt grass.

Photo courtesy: James H. Miller, USDA Forest Service, www.forestryimages.org



caria), a non-grass species. Most foresters, wildlife specialists, and natural resource professionals can identify Japanese stilt grass, or you can contact the UK Forestry Extension Department at 859.257.7597 (forestry.extension@uky.edu) for help with identification.

Woodlands at Risk

The majority of this grass will occur within or along a woodland road, forest or field edge, or disturbed bottom. It can move from these areas slowly into undisturbed and shaded areas. If these areas are exposed to sunlight, this grass will respond with vigor. As with most invasive species, preventing or reacting quickly to invasion is critical. Disturbed ground that is moist and highly productive is most likely to be at risk for invasion.



A bottomland forest understory that was completely invaded by Japanese stilt grass after a shelterwood harvest. Tree seedlings had been underplanted and many were lodged by the heavy stilt grass cover. Photo courtesy: Chris Oswalt

Control

Long-term control requires not only the eradication of the plants but continued control of germinating seed that may occur for several years after controlling the initial plant population. The species is fairly shallow-rooted and can easily be pulled in a similar fashion to crabgrass. Mowing must be done very close to flowering time in late August or early September. If mowing is completed earlier, the grass will generate new flowers and ultimately seed. The mowing or hand pulling must continue until the seed stored in the surface soil is depleted; in some instances, this may take up to five years. Unfortunately, many infestations cannot be mowed or are too large to be hand pulled; then chemical control is required.

Japanese Stilt Grass

Kentucky Forest Health Task Force

Herbicides can be effective in controlling Japanese stilt grass. Broad-spectrum herbicides that kill both broadleaves and grasses can be used (for example, Roundup and other glyphosate products) as well as herbicides that are specifically designed to kill grasses. The advantage of using grass herbicides is that they limit the unwanted killing of beneficial and native broadleaf herbaceous plants, shrubs, and trees. Foliar sprays can be used to kill existing plants, and some preemergent herbicides have been tested and shown effective in killing the germinating seed. The latter is useful given that the species is an annual and must reseed every year, and the seed stay viable in the surface soil for several years.

A single foliar application of glyphosate herbicide (examples include Roundup, Accord, Rodeo) at the typical 2 percent foliar solution has been shown to provide effective control of established plants. These nonselective herbicides are best used in situations where Japanese stilt grass is the only plant present. Research¹ using various grass herbicides such as clethodim (Select or Select Max), sethoxin (Post),

and fluzifop-P (Fusilade) were shown to provide 50 to 88 percent control with one application and 82 to 99 percent control when applied twice. Preemergent herbicides such as oryzalin (Surflan) and imazameth (Plateau and Journey) have been shown to be effective, resulting in close to 90 percent control eight weeks after application. Grass herbicides are a better choice where other plant species are mixed with the stilt grass.

The key to controlling this species is to stop seed production and continue to treat plants that emerge from the seeds in the surface soil. Cultivating or disturbing the ground could significantly increase the emergence of plants from stored seed. This could be used to advantage if preemergent or postemergent treatments could be administered to kill the exposed seed or newly established plants. By stopping seeding for several years, the invasion can be slowed and potentially stopped.

Table 1. Control methods for Japanese stilt grass (*Microstegium vimineum*)

Method	Timing	Details and Cautions
hand pulling	July – early September	Pull plants before seeds form. Plan on hand pulling annually until plants are no longer germinating (3 to 5 years).
mowing weed eating	Late August early - September	Treat directly prior to flower formation. Mowing too early can cause reflowering. Plan on continued mowing 3 to possibly 5 years or until plants no longer are germinating.
herbicide ¹ - nonselective (glyphosate)	June – July	Foliar applications of 2% glyphosate. Accord is labeled for use in woodlands and Rodeo for wetland areas. Use other glyphosate products for other areas ² .
herbicide ¹ grass	June – July	Use foliar applications at recommended rates for crabgrass control. (ex. Select, Select Max, Fusilade, Post, based on location and label instructions).
herbicide ¹ - preemergent	early spring	Apply at recommended rates. (ex. Plateau or Journey at 6 ounces per treated acre).

¹ Other herbicide brands can be used for Japanese stilt grass. The herbicides that are listed are those that have been used regionally.
² There are currently a large number of brand names for glyphosate herbicides. Many are for use in fields or fencerows. Few such as Accord are labeled for use inside a forest (see Kentucky Woodland Magazine 1(1)) for more information on glyphosate herbicides.

Mention or display of a trademark, proprietary product, or firm in text or figures does not constitute an endorsement and does not imply approval to the exclusion of other suitable products or firms.

¹Judge and others. 2005. Preemergence and Postemergence Control of Japanese Stiltgrass (*Microstegium vimineum*). Weed Technology 19: 183-189.

Graphic courtesy: Ted Bodner, Southern Weed Science Society, www.forestryimages.org

About the Author:

Jeff Stringer, Ph.D. is a hardwood Extension Specialist at the University of Kentucky and is responsible for continuing education and research in hardwood silviculture and forest operations. He is also an editor of the Kentucky Woodlands Magazine.

Cooperative Extension Service, Department of Forestry, University of Kentucky, 213 Thomas Poe Cooper Bldg., Lexington, KY 40546-0073; E-mail: stringer@uky.edu; Phone: 859.257.5994; Fax: 859.323.1031.

www.KyForestHealth.org

-Thoughts from Jim Corum, President KWOA

You Should Manage Your Woods... SAY WHAT?!

“Let me see if I understand this, you are asking me to manage my woodland and spend my own money to grow more Grade 1 logs. Is that it? Well, you know I’m now providing tree cover to enhance tourism, recreation, hunting, and adventure tourism. Along with that, I’m providing free to the public cleaner air, water, and carbon sequestration. Wait there’s more; I also provide a place for ATV trespass, garbage, theft of ginseng, cohosh, goldenseal, and even my timber. Now, for all that, I get to subsidize the property tax of urban residents by paying an unfair, unconstitutional property tax that creates a major competitive disadvantage for me, when compared to timber growers in other states. Anyhow, it’s hard to find out what my good logs are worth AND some so-and-so burned most of my woods three years ago and, because of that, most of the young trees in the area that burned are dead or damaged at best.”

Now for the Rest of the Story...

While I have all of these issues, and as you can tell, get frustrated with them, I still own my woodlands, love to live and work in them, and will continue. However, some of my frustrations may be common to you, and I believe our frustrations point to where we need to come together as a group and make changes to help woodland owners in Kentucky.

If you face some of the issues that I do, or just love your woodlands, I strongly urge that you become a member of the Kentucky Woodland Owners Association (KWOA) and help all of us deal with the problems and challenges of woodland ownership.

As a KWOA member I have seen the organization deal with issues such as: woodland arson, log price reporting, woodland taxes, and timber theft. KWOA has a history of activism to help woodland owners and the more of us there are the better our chances of making changes. Members of the KWOA can tell you that woodland ownership can be very rewarding and the use of simple woodland management practices can benefit you significantly.

If you are interested in improving your enjoyment of your woods we strongly urge that you become a member of KWOA and be provided with pertinent information on woodland ownership, opportunities to support meaningful legislative efforts to improve woodland ownership, and develop ties with other woodland owners through the formation of Local Forestry Organizations.

For more information about KWOA contact Betty Williamson at 270.821.8657 or e-mail at willdan@bellsouth.net.

Photo courtesy: David S. Maehr



Build Your

by Thomas R. Biebighauser

Perhaps the most important project you can complete to help wildlife in a woodland is to build a wetland. Every animal from white-tailed deer, waterfowl, frogs, and salamanders will benefit from having a shallow water habitat in the forest.

Wetlands don't have to be large to help wildlife. One that is only 18 inches deep and 30 feet across can help wood ducks, spotted salamanders, and wild turkey. Properly constructed, a wetland can be expected to last for thousands of years. Provided your land has soils that are high in clay, a wetland can be built for under \$1,500.

Techniques are now available for building a wetland just about anywhere on a landscape. Mountain ridge tops, benches, small bottomland fields, mined areas, and even transmission line right-of-ways can be turned into a wetland. The good news is that you don't have to be an expert to construct a wetland. Following these simple steps will lead to success.

When looking for a place to build a wetland, search for land that appears level, whether in an open field, young forest, or canopy gap within an older forest. An area that is 80 feet in diameter or larger will provide enough space for building a wetland that appears natural.

There is no need to interrupt a stream to build a wetland. Avoid the high costs and negative environmental impacts associated with damming a stream by choosing a location on higher ground. Building a wetland on a dry ridge is a good idea. You'll supply much-needed water to wildlife and can avoid problems associated with buried gravel often found along streams.

Select an area that changes 3 feet or less in elevation from upper to lower edge. If the ground looks flat enough to pitch a tent on for a good night's sleep, then it is level enough to build a wetland. It's always better to stair-step several shal-

lower wetlands down a steep slope than to build one large one with a huge dam.

Use plastic flagging to mark the perimeter of a construction site that is at least twice as large as the surface area of water planned in the new wetland. The added space will be needed for piling woody debris, vegetation, and topsoil and for building a dam with gradual slopes. Don't be afraid to remove some trees to create a wetland. In many cases, they are now only growing on a site because it was historically drained.

Determine whether the wetland you are building will be supplied by surface water or by ground water (see key below). A surface water wetland holds rainfall like a cereal bowl, that is, within a depression of packed soils that are high in clay and a dam that prevents water from flowing downhill. A ground-water wetland contains water like a large hand-dug well, exposing a high water table present near the surface.

Wetland Construction Strategies Key

Use the following key to identify the best construction method to use in building a vernal pond. This key uses information you obtain by testing the soil at the construction site. Start by reading both A's to see which one applies to your area.

If....

- (A) Water seeps into the test hole from the bottom and sides and rises near the surface: **Use the Ground-Water Strategy**
- (A) Little if any water seeps into the test hole... (go to step B)
- (B) Soils high in clay (you can make a ribbon 2 inches or longer): **Use the Surface-Water Strategy**
- (B) Soils not high in clay: **Use a Synthetic Liner**



Own Wetland

Photos courtesy: Thomas R. Biebighauser

An indication of the type of wetland that can be built may be determined by using a post-hole digger to dig a hole at least 3 feet deep near the center of the worksite. Watch to see if water seeps into the hole from the bottom and sides. If the hole fills partially or completely with water, a high water table is present, and a wetland can be built that will fill with ground water.

When considering the possibility of building a surface-water wetland, the amount of clay in the mineral soil must be determined. Mineral soil is located below the topsoil layer, which is dark colored and contains fine roots and organic material. Soils suitable for holding surface water are high in clay and silt. Soils with enough clay feel smooth and sticky like a mashed Tootsie Roll, while those with silt feel like wet flour. Soils that have too much sand and gravel feel gritty.

A simple test can be used to determine if the clay and silt content is high enough to build a surface-water wetland. Make a 1-inch ball of soil, add some water, and then try to form a thin ribbon between the thumb and forefinger that is 2 inches long or longer before breaking. If you can make a ribbon that is at least 2 inches long before it breaks, then the soil has enough clay and silt to be shaped and packed to hold surface water. Both natural and restored wetlands maintained by surface water have dams consisting of compacted clay that prevent waters from flowing downhill to a stream or river.

Before you begin construction, obtain necessary permits and approvals. Permits are generally required when building in a floodplain or within an existing wetland. Additional approvals may be required concerning archeological resources and federally endangered species.

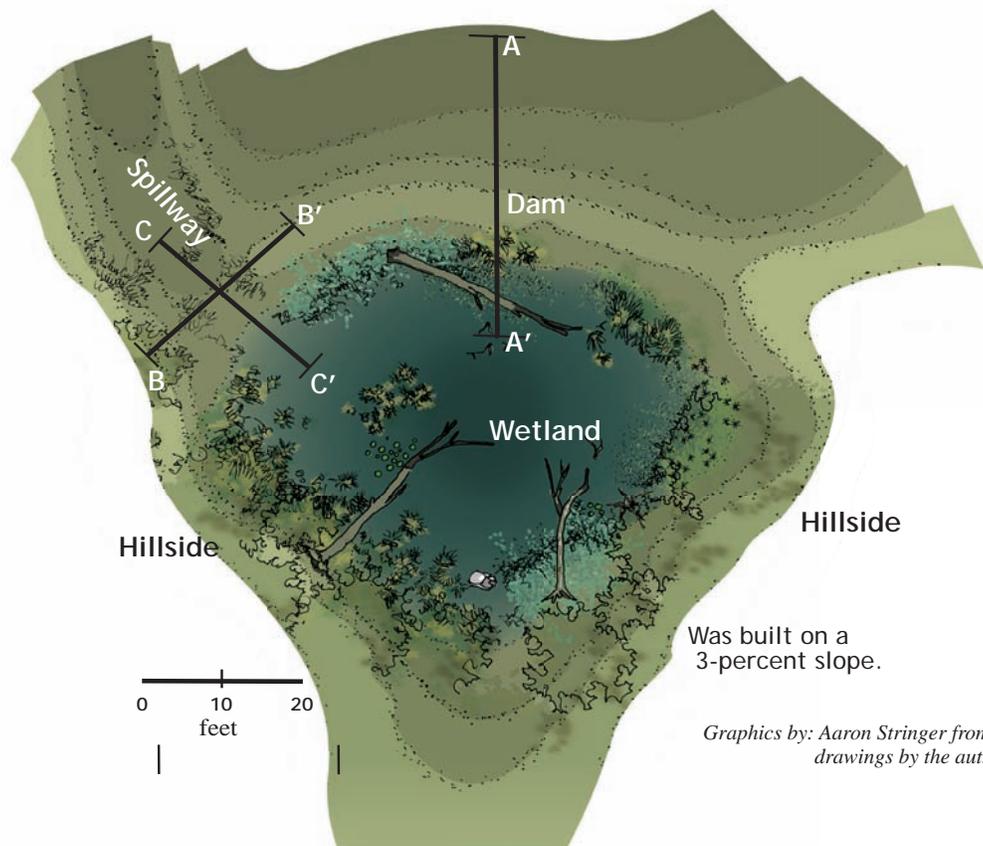
Let's assume you've found a location that has enough clay to build a surface-water wetland. These wetlands

should be built only when soils are dry enough to shape and pack, which usually corresponds to when farmers are in their fields working. Avoid building during drought as dry soils cannot be packed, and loose soils will not hold water.

Hire an experienced heavy equipment operator to build the wetland. A combination of an excavator and dozer works best for construction. The dozer should be equivalent to a Cat D5G, having 90 HP or greater, weighing at least 20,000 pounds, with metal tracks, a 6- or 7-way blade, and an inside C-frame. The excavator should be equivalent to a Kobelco 135SR or larger model having 90 HP or greater, metal tracks, weighing at least 28,000 pounds, and a bucket that is 42 inches wide or greater.

Begin construction by clearing vegetation and hiding it in small piles behind trees along the lower edge of the work site so it will not dominate the view of your new wetland. Save any large trees that are removed for placement in the completed wetland.





Once vegetation has been removed, use a simple construction level and survey rod to determine the location and elevation of the dam to be built. Begin by setting up the construction level on higher ground overlooking the work site. Choose a point along the uphill edge of the cleared area where you would like water to reach in the new wetland. The reading on the rod at this point will equal the elevation where water will reach in the new wetland and will be the same as the spillway elevation, which we will call "S." Mark the beginning of the dam and the spillway location by walking to one side of the flagged area and finding where the elevation is equal to S, placing a wire flag in the ground at this point. Now walk over to the other side of cleared area, mark where the elevation is also equal to S, and set a wire flag at this point. Next, mark where the wetland dam and core will be located by adding flags between these two flags, forming a line with a gentle arc that bows downhill. This line marks the center of the dam to be built and should be at least 40 feet uphill from the lower edge of the cleared area so there will be enough room to place topsoil and a gradual slope on the backside of the dam. The elevation of the dam will be equal to "S" plus 12 inches for that portion of the dam that will be built above the water level in the new wetland.

After the location of the dam has been marked, use the dozer to remove roots and topsoil, pushing approximately one-half of the material downhill along the lower edge of the cleared area and the other half uphill in piles that are out of the way. The excavator should then be used to dig a trench for the core along the entire length of dam to be built. The trench should be dug as wide as the blade is on the dozer and extend down into the ground so that the bottom is based on bedrock or an impermeable layer of clay. The core must be dug below the bottom of all crayfish burrows and interrupt and block all buried drain lines, gravel layers, sand pockets, buried shrubs, and trees. An average depth for the core trench is 6 feet on ridge tops and 12 feet deep or more near streams and rivers.

Fill the core with soils that are high in clay. Use suitable soils removed from digging the core trench, and scrape additional clay from the area in front of the dam. Spread the clay in layers 12 inches thick or less within the trench, and run over each layer four times or more for compaction. Build the dam the same way over the top of the filled core trench. The top of the dam should be level and be at least as wide as the blade on the dozer. Placing gradual slopes (10 percent or less) on both the front and back of the dam will ensure longevity, increase plant diversity, and improve the appearance of the new wetland.

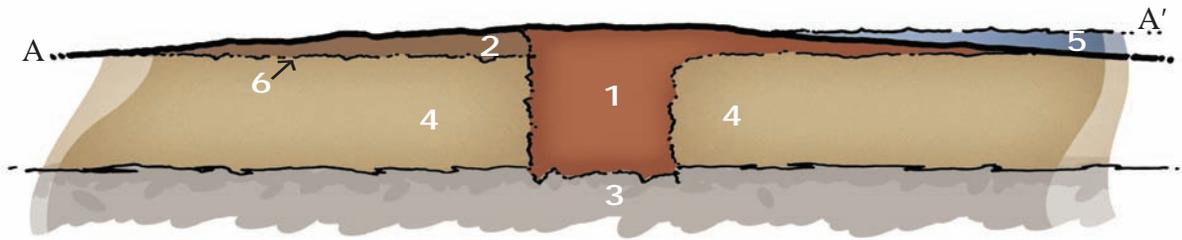
Decide how deep you would like the water to be in your new wetland. Wetlands that are 18 inches deep or less can be expected to dry in drought years and will provide critical habitat to frogs, toads, and salamanders that can't compete with fish. Deeper wetlands may contain water year round and will provide drinking water to deer, wild turkey, and bats in time of drought. Make sure the heavy equipment operator is aware of your desired maximum depth for the new wetland.

Build your wetland with an interesting and irregular shape, avoiding rectangles, squares, and straight lines that appear artificial. Generally, the more gradual the slopes and the wider the top of the dam, the better it will blend with its surroundings.

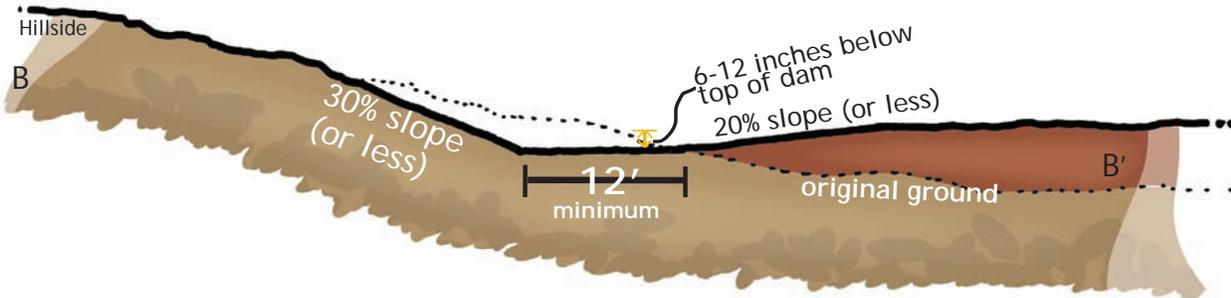
Construct a gradually sloped spillway that is at least 12 feet wide to carry overflow from the wetland and around the dam. The spillway should be located on undisturbed ground at one end of the dam along the upper edge of the cleared area. The elevation of the spillway should be from six to 12 inches below the top of dam to handle overflow. Waters leaving a wetland over the spillway should follow a gradual path downhill away from the dam so as not to cause erosion.

Spread topsoil over the dam and the bottom of new wetland. The topsoil will promote the rapid growth of plants on exposed

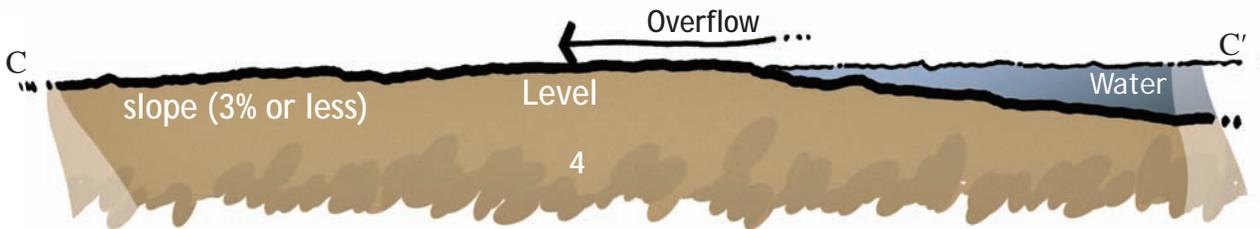
**Profile A
Dam**



**Profile B
Spillway Construction**



**Profile C
Spillway Path Construction**



Note: The spillway path follows undisturbed ground.

The following numbers correspond to the labels in each graphic:

1 = Packed silt-clay groundwater & dam (10% slope or less)	4 = Undisturbed ground
2 = Backside of dam (10% slope or less)	5 = Wetland
3 = Bedrock or impermeable clay base	6 = Topsoil

soils above the water level, and they may contain dormant aquatic plant seeds that will grow in your new wetland. Place logs and branches in and around the wetland to improve habitat for birds, salamanders, and turtles and to prevent damage caused by unwanted off-highway vehicle users. Apply wheat seed over exposed soils above the water line, and cover with a layer of straw. You may also wish to seed exposed soils with a permanent mixture of native species consisting of Indian grass, big bluestem grass, switchgrass, and partridge pea.

Individuals who have built a wetland in their woodland say it is one of the most gratifying projects they've ever completed. To learn more about the highly effective techniques for building wetlands of any type, you are encouraged to read Tom Biebighauser's new book *Wetland Drainage, Restoration, and Repair*, published by the University Press of Kentucky. Tom has built more than 1,000 wetlands in the United States and Canada and teaches hands-on workshops where participants learn more about wetlands by taking part in their construction.

About the Author:

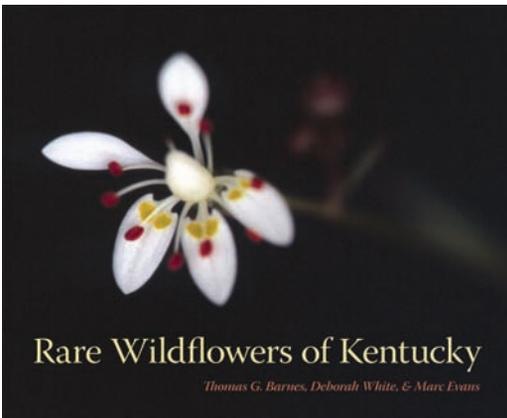
Thomas R. Beibighauser is a Wildlife Biologist for the US Forest Service and has built over 1,000 wetlands in 10-States and two-Canadian Provinces. He teaches unique hands-on workshops where individuals learn how to build wetlands by participating in their restoration.

USDA Forest Service, 2375 KY Highway 801 South, Morehead, KY 40351;
E-Mail: tombiebighauser@fs.fed.us; Phone: 606.784.6428 ext. 102.



Information is Power!!!!

Getting the right information when you need it is vital to the management and enjoyment of your woodlands. We wanted to make you aware of a number of information sources, products, and services available through UK Forestry Extension to help you make the most of your woodlands.

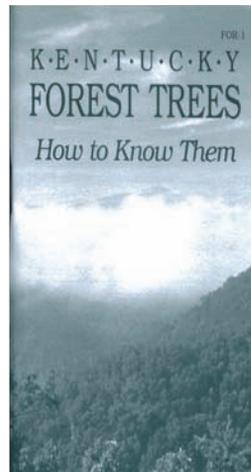


New Book - Rare Wildflowers of Kentucky

Award winning author and photographer Thomas Barnes, an extension professor of forestry and wildlife specialist with UK Forestry Extension, has written and provided photographs for a number of books that are available through the University of Kentucky Press. The books include Gardening for the Birds, Kentucky's Last Great Places, Wildflowers and Ferns of Kentucky, and Rare Wildflowers of Kentucky.

Kentucky Forest Trees: How to Know Them

Available for \$1.50. This booklet covers 87 of the most common trees in Kentucky and provides information on where they grow; ID characteristics of the bark, twigs, buds, leaves, flowers, and fruit; and information related to their value and uses.



Forest Health
Invasive Plant Hit List: Tree-of-Heaven
By Jeff Singer

Forest Health
One of Kentucky's Least Wanted Weeds: Winter Creeper
By Jason Bunker

Forest Health
Invasive Plant Hit List: Garlic Mustard
By Jeff Singer and Thomas Barnes

Small Trees (less than head high)
Fallor Spruce and Red Spruce

Large Trees
Oak Bark Beetle

Periodically Advancing
Frontier of the

14 Kentucky Woodlands Magazine

10 Kentucky Woodlands Magazine

12 Kentucky Woodlands Magazine

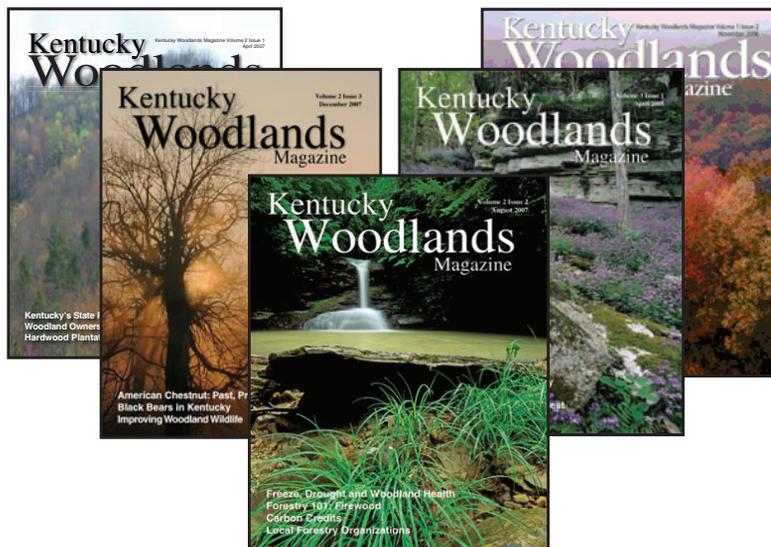
Invasive Plant Control

Forest Health articles on invasive plants are available online at www.ukforestry.org. Click on the new publications link.

- Tree-of-Heaven
- Winter creeper
- Garlic mustard
- Kudzu

Extension...

“Information is Power”

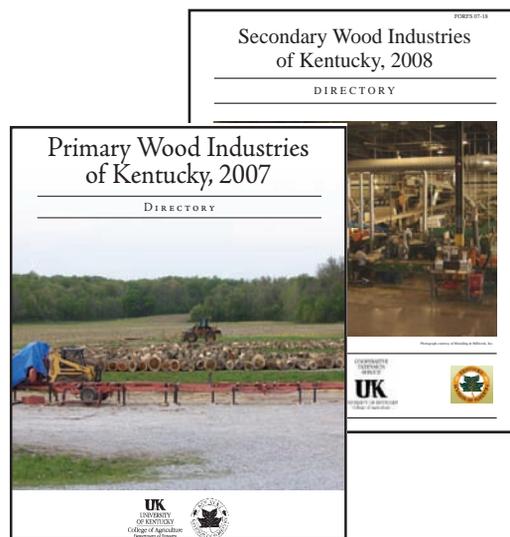


Kentucky Woodlands Magazine

Past issues of Kentucky Woodlands Magazine are available online at www.ukforestry.org. Click on Kentucky Woodlands Magazine link.

Primary and Secondary Wood Industries

Copies of the Primary and Secondary Wood Industries of Kentucky can be seen on the web at www.ukforestry.org. Click the publications link.



Call 859.257.7597 for information on any of these publications.

Master Tree Farmer 2008



As indicated in the previous edition of the Kentucky Woodlands Magazine the Master Tree Farmer 2008 Satellite Series will be conducted in September. However, due to budgetary issues, we will not be able to use Kentucky Educational Television (KET) to broadcast the program as we were able to do in the past. However, there is still hope for Master Tree Farmer in Kentucky. While it is not possible to broadcast Master Tree Farmer via KET in real time, we are obtaining first generation copies of all three nights of the program and will conduct the program over the internet at a later date. We will do this through the use of webinar technology that is available at a number of Cooperative Extension county offices in Kentucky. It is our hope that we can schedule the program for three nights this winter. Stay tuned for further information in the next issue of the Magazine.

Forestry 101

Forestry for Woodland Owners

The Value of A Tree

by Doug McLaren

Almost everyone will have the opportunity to buy or sell at least one car in their lifetime. If you are a woodland owner, you will also want to have the opportunity to sell timber from your woodlands. When the time comes to sell trees, as it is when you sell a car, the most obvious question for woodland owners is, "What is the realistic value of my timber?" You will quickly recognize that managing timber during the entire life of the stand will in most instances provide you with a higher potential value for your management efforts.

A number of factors can help in evaluating the potential value of your timber stand. One leading factor that improves the sale price of timber is the species of trees involved in the sale. Without question, having walnut as your major species component will provide a higher price. Stands that are composed primarily of pine, elm, and hackberry will be less attractive to potential buyers.

Individual stem quality is a very important factor to any buyer. Stem quality refers to how sound and free from defects the stem is. These defects might be the result of previous fires in the stand that have created internal blemishes and cavities that reduce the usable wood in each stem. The more defects found in any stem, the more work will be required either at the log landing or the mill to retrieve quality lumber. Handling unused wood will be an additional expense to the buyer.

Size of the individual stems being harvested will be assessed by a potential buyer. Individual large logs are extremely difficult to handle, but loggers are much more willing to handle fewer larger diameter stems than smaller stems. The reason? The larger the individual stem, the more valuable and more numerous the products that can be recovered from each stem. Larger stems also require fewer trips in and out of the woods and less time loading and unloading onto trucks and sawmill equipment.

Just as with any real estate venture, location of your woodland stand is important. There is the potential for a higher selling price if the stand is close to a major road system or to several competitive sawmills and if the woodland stand has an established woods roads.

These are only a few of the factors that a potential buyer evaluates when bidding on a timber sale. It can be seen now why woodland management needs to continue immediately after any harvest. It will benefit the forest manager for future sales to assure that the species favored in the management process are those stems with a potentially higher market price. Thinning and improvement cuts and other mid-rotation management investments are made to maintain a good growth rate on those trees to ensure quality and size when harvested. It is definitely important to maintain fire control at all times. Many of these woodland management operations can be carried out more effectively if a good road system is designed and maintained throughout the entire rotation of the trees.

Management throughout the entire rotation of your timber stand will help to ensure an increase in value of the stand when harvested.

About the Author:

Doug McLaren is an Area Cooperative Extension Specialist with the University of Kentucky Department of Forestry.

Cooperative Extension Service, Department of Forestry, University of Kentucky, 107 Thomas Poe Cooper Building, University of Kentucky, Lexington, KY 40546-0073; E-mail dmclaren@uky.edu; Phone 859.257.2703; Fax 859.323.1031.



Photo courtesy: Billy Thomas

Standing timber value (also known as stumpage value) is determined by a variety of factors including: tree species, size, quality, volume (overall and of individual trees), access, topography, distance to mills, and market demand. Woodland owners can positively impact several of these factors (tree species, size, quality, volume, and access) through woodland management activities.

In Honor



Tim McClure

Editors Note: It is with great sadness that we communicate the news of the passing of Tim McClure forest health specialist for the Kentucky Division of Forestry and Dr. Dave Maehr conservation biology professor at the Department of Forestry at the University of Kentucky. Our world has been turned on its side, as reflected by the cover of this magazine, by these tragic and unexpected losses to the forestry and natural resource communities.

-- Jeff Stringer and Diana Olszowy, Editors



David Maehr

by Diana Olszowy

The 10th of May was a dark day for the Division of Forestry as well as the entire forest health community. Thomas “Tim” McClure passed away unexpectedly causing a gaping hole in the fight against insect and disease threats to Kentucky’s forests.

Tim was the Forest Health Specialist for the Kentucky Division of Forestry and was instrumental in the detection and treatment of hemlock woolly adelgid. Tim took great strides in making sure that all partners (public and private) were aware of the threat that the adelgids were to Kentucky’s hemlock. He provided training to local officials and legislators in southeastern and eastern Kentucky, public agencies (parks, fish and wildlife, nature preserves, forestry, US Forest Service, etc.), and recruited “spotters” from local boy scout troops, ATV clubs, hiking clubs and mountain biking clubs. Tim was part of the group that founded “Save Kentucky’s Hemlocks”, which is a coalition of individuals and organizations that had just received more than a \$100,000 in funds to help eradicate the adelgids threatening our hemlocks.

Tim not only battled hemlock woolly adelgid, he monitored for the incoming emerald ash borer, sudden oak death pathogen, beech bark disease, exotic bark beetle surveys, invasive exotic plants and was an active member of the southern group of state forester’s forest health task force and the Kentucky Forest Health Task Force. He also provided training to division of forestry foresters and

ranger technicians on insect/disease and invasive plant threats.

His delightful sense of humor and his respectful, professional integrity made him a truly valuable employee and an honored coworker. The loss of Tim has turned our world on its side (just like the cover of this magazine). He will be and is already greatly missed by his coworkers and those who knew him.



by Wendell Berry

David Maehr died on June 20 while carrying on the work that was his lifelong commitment: the effort to save the remnants of wildlife and wild habitat from destruction by an economy that respects no limits. Dave was a professor of wildlife and conservation biology in the Department of Forestry at the University of Kentucky. His death, at the age of 52, is a tragedy for his family, his students and colleagues, and his other friends. It is also a grievous loss to the conservation movements of our state and nation.

Dave was noted for his work with elk and black bears in Kentucky and with black bears and panthers in Florida. His book, *The Florida Panther*, is compounded of disciplined science, valuable insight into conservation problems, and good stories. He understood that there is no such thing as single-species conservation. He wrote of the “complex interactions whereby individual species are considered just one of many natural functions of the landscape.” He knew, as he wrote to me, that “ecology and beauty [are] important elements of a definition of forest sustainability.”

My own trips into the woods with Dave are among my finest memories. For five years he and I, with two or three of his students and my friend Harold Tipton, gathered for what Dave had begun to call the “Annual Henry County Bird Count,” which were productive equally of knowledge and fun.

David Maehr was dedicated, intelligent, learned, curious, adventurous, humorous, and a great companion.





Kentucky Big Tree Program
Outstanding in
the Field -
Literally!
The National and
State Champion
Chinkapin Oak



Chinkapin oak leaf
Photo courtesy: Wimbish Tree Farms,
www.wimbishtreefarm.com

by *Diana Olszowy*

This new national and state champion Chinkapin oak is a long-term resident of a large, well-preserved remnant of Bluegrass-savanna-woodland located smack-dab in the middle of Kentucky's Inner Bluegrass region. The tree resides on the 746-acre Griffith Woods research farm in Harrison County which is managed cooperatively by the University of Kentucky, The Nature Conservancy and the Kentucky State Nature Preserves Commission.

When one describes the Bluegrass Region of Kentucky to a non-resident, they mention the vast expanses of rolling hills carpeted with grasses and wildflowers and presided over by majestic old trees like bur and Shumard oaks, blue and white ashes, hickories, hackberries and Kentucky coffeetree. Large, open-grown trees, referred to in forestry terms as "wolf" trees, are scattered across the region. Without any competition from nearby neighbors, these trees take full advantage of their growing conditions and reach for the sky, vertically and horizontally. The new Chinkapin oak champion is no exception - while only 76 feet tall and 69 feet in spread; the tree's circumference is a whopping 311 inches, that's nearly 26 feet around!

Chinkapin oak, also called yellow oak, yellow chestnut oak and rock oak and is sometimes spelled "chinquapin," is generally believed to be derived from "chinkomen," an Algonquin term for chestnut. Chinkapin oaks are very adaptable to many soil and pH conditions. They are a tough species and can be found naturally in dry, upland soils and are very

tolerant of heat and drought; making them an excellent urban tree as well.

Chinkapin oaks are considered a medium to large-size tree; averaging 50 – 70 feet in height and 50 – 60 feet in spread. They are a common resident in much of Kentucky and extend north into New England, west to Minnesota, and south to Texas and southeast to northern Florida. Historically through its range, early pioneers used Chinkapin oak wood to make thousands of miles of fences in the states of Ohio, Kentucky and Indiana. Later on, the trees were used to fuel the steamships that ran from Pittsburgh to New Orleans and were also used as railroad ties for the new railroads that crisscrossed the Midwest.

This tree has witnessed centuries of change and has lived to tell its tale. It provided blissful shade and a plentiful bounty of acorns for bison and elk in its youth; later cattle and horses reaped its benefits and who knows, maybe someday bison and elk will return to this tree outstanding in the field.

About the Author:

Diana Olszowy is Stewardship and Education Branch Manager with the Kentucky Division of Forestry. She is also an editor of the *Kentucky Woodlands Magazine*.

Kentucky Division of Forestry, 627 Comanche Trail, Frankfort, KY 40601; E-mail: diana.olszowy@ky.gov; Phone: 502.564.4496; Fax: 502.564.6553.

Test Your Knowledge

Photo courtesy: Kentucky Division of Forestry



A.

I am a fast-growing tree that is commonly found throughout the state. My heartwood ranks second only to black walnut and my fruit is relished by many birds. Unfortunately, the eastern tent caterpillar also relishes my leaves every spring causing me to leaf back out every year. Most people recognize me by my burnt potato chip bark – do you?

C.

I am found exclusively on white oak but only in the spring. Located inside my home are my grubby siblings who



secrete a chemical which causes the up to one-inch gall you see. I will eventually develop into a cynipid wasp and carry on in my family's tradition of gall making. By the time you notice my work, it's too late to control me but its okay because I don't cause too much damage anyway. Chances are you've seen me before, but do you know my name?

Photo courtesy: Lisa Ames, University of Georgia, www.forestryimages.org

D.



I have the perfect alibi; my work is often misidentified as insect borer holes on the trunks of trees. But actually, my holes are neatly arranged in a pattern of horizontal, vertical or diagonal rows and are not normally very deep. I use these holes to lure insects and to eat the sap that flows from the openings. I'm a common visitor to pine, maple and several other species and many like to use my name as an insult. Who am I?

Photo courtesy: Purdue University, Plant & Pest Diagnostic Laboratory www.ppd.l.purdue.edu/PPDL/

B.

Photo courtesy: Arnold T. Drooz, USDA Forest Service, Bugwood.org www.forestryimages.org



I am the reason why your black locust tree looks like it is dying every summer. My job is to mine inside the leaves and skeletonize them causing them to turn gray or brown, often suggesting an early fall color change. My work does not usually kill the tree, but it definitely makes it unsightly. Even though I prefer black locust, you will occasionally find me in honeylocust, beech and hawthorn. Do you know me?

E.



Warm, moist springs are ideal for me to attack your fruit trees, especially apples, pears and crabapples. I cause these trees to dieback in their crowns, creating a "shepherd's crook" and giving them the appearance of being burned. My spores are easily spread by insects, rain splash and infected pruning tools – have you figured out what I am?

Photo courtesy: Mark Longstroth, Van Buren County Extension, www.canr.msu.edu/vanburen/fblinks.htm

Answers to Test Your Knowledge can be found on page 25.



Photo courtesy: Deborah Hill

Alley cropping is the fifth of a five-part series of Agroforestry articles.

Agroforestry also includes the following practices: wind breaks, riparian buffer strips, silvopasture, and forest farming. See Kentucky Woodlands Magazine Vol. 1 Issue 2 for more information.

Non-Timber Forest Products

Agroforestry Part Five: Alley Cropping

by Deborah B. Hill

Alley cropping is probably the most commonly used technique of agroforestry. It simply involves planting single lines of trees and/or shrubs intercropped with a wide “alley” of either row crops or pasture grasses. The width of the alley is determined by the size of the harvesting equipment needed for the crop grown in the alley. Sometimes the alleys are fairly narrow—for corn or other row crops for example—and sometimes the alleys are very wide (greater than 60 feet, for example). The trees may include valuable hardwood veneer or lumber species; nut, fruit, or Christmas trees; or desirable softwood species for wood fiber production. As we learned in silvopasture, the alleys may also be used for pasturing livestock.

Benefits of alley cropping systems include:

- making the existing agricultural system more sustainable,
- improving plant and animal diversity on the site,
- improving economic stability by mixing short-term and long-term crops,
- increasing cash flow as tree crops produce something marketable, and
- improving the aesthetics of the site.

Some options for crops for the alleys include row or cereal crops such as corn, soybeans, wheat, barley, oats, potatoes, peas, beans, and forage crops such as fescue, alfalfa, orchard grass, bluegrass, ryegrass, brome, timothy, and clovers. The tree/shrub component could be landscape plants such as blue

spruce, dogwood, redbud, Christmas trees, dwarf fruit trees, or certain medicinal plants. They could also include biomass crops such as true poplars (*Populus* spp.), willows, birches, or switchgrass. Another option is shrubby species that are known as “woody florals”—species that are used in the florist trade, such as curly or corkscrew willow or red-leaf osier, species with stems of unusual shape or color. These latter species, once established, can be cut either every year or every other year and will sprout back with new growth. As with the other techniques that mix tree and non-tree plant species, it is important to be aware of maintenance needs and the appropriate use of chemical fertilizers and biocides.

Whatever is used on the site must be compatible with all crop species present. Siting the lines of trees in an east-west direction is best for making sunlight available, but if the main reason for including trees in this type of technique is to prevent soil erosion on slopes, then the lines of trees should follow the contours of the land.

When choosing the tree crop, look for species that will produce a high-value product or a multiple of high-value products (e.g., wood, fruits or nuts, chemicals). Also consider their usual rate of growth, and select for species that are either fast growing or moderately fast growing (note options for shrubs above). Tree species need to be tolerant of a variety of soil conditions and, if full-sized trees, they need to produce a lighter rather than a heavier shade so that they will interfere less with the companion crop. Also in consideration of the companion crop, the trees should be deep rooted so

that their roots will not compete directly with the more shallow roots of the companion crop. Other factors to be considered with regard to the trees are possible nitrogen fixation, a short growing season, production of a foliage that decomposes quickly and does not acidify the soil, and absence of allelochemicals (chemicals produced by some trees — black walnut for example — that inhibit the growth of other plants around them).

Crops in the alleys may change over time unless one begins with crops that are at least partially shade tolerant. When the trees or shrubs are first planted, they will need protection from animals and from equipment so that they have a chance to establish well.

This may involve fencing, herbicide applications, tree shelters, lines of electric fencing, or other protective measures. This would probably be necessary only for the first year or two after planting.

Alley cropping is one of the easiest agroforestry techniques to implement — and one that can bring economic and aesthetic benefits to a farm in a relatively short period of time.

About the Author:

Deborah Hill, Ph.D. is a forestry extension professor and forestry extension specialist at the University of Kentucky Department of Forestry, she is responsible primarily for programs in non-timber forest products. She also works with 4-H and youth, and in the areas of urban forestry, agroforestry, and permaculture. She has developed landowner programs in Christmas tree and shiitake mushroom production.

Cooperative Extension Service, Department of Forestry, University of Kentucky, 210 Thomas Poe Cooper Building, Lexington, KY 40546-0073; E-mail: dbhill@uky.edu; Phone: 859.257.7610; Fax: 859.323.1031.



Photo courtesy: Center for Agroforestry at UMO

Alley cropping usually involves single rows of trees separated by a wide enough “alley” to grow another agricultural commodity. If livestock are involved, the alleys would support pasture grasses. Otherwise, the alleys can support agronomic crops, either row crops (milo in the above example grown with pecan trees), or hay crops for cutting, or vegetable crops such as pumpkins or other ground-covering crops.

Kentucky Woodland

2008 Farm Bill Update

The Food, Conservation, and Energy Act of 2008 (also known as the 2008 Farm Bill) is now law. While many details are still being resolved a few of the voluntary financial incentive programs that are included in the farm bill and are of special interest to woodland owners are highlighted below¹. Stay tuned to Kentucky Woodlands Magazine for more information and details related to the 2008 Farm Bill and what it means for Kentucky's woodland owners.

EQIP Overview

The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land. Through EQIP, the Natural Resources Conservation Service provides financial incentives to promote agricultural production and environmental quality, optimize environmental benefits, and help farmers and ranchers meet Federal, State, and local environmental regulations.

WHIP Overview

The Wildlife Habitat Incentives Program (WHIP) helps private landowners to develop and improve high quality wildlife habitat.

WRP Overview

The Wetlands Reserve Program (WRP) provides technical and financial assistance to private landowners to restore, protect, and enhance wetlands in exchange for retiring eligible land from agriculture.

HFRP Overview

The Healthy Forests Reserve Program (HFRP) is a new program established for the purpose of restoring and enhancing forest ecosystems to: 1) promote the recovery of threatened and endangered species, 2) improve biodiversity; and, 3) enhance carbon sequestration.

More Information about the 2008 Farm Bill

For more information and updates about these programs and other Farm Bill topics, please visit the U.S. Department of Agriculture Web site <http://www.usda.gov/farmland> or the Natural Resources Conservation Service Web site <http://www.nrcs.usda.gov/programs/>

¹The above information was compiled from the USDA Natural Resources Conservation Service Web site <http://www.nrcs.usda.gov/programs/farmland/2008/ataglance.html>.



Armadillos in Kentucky

Update from Thomas Barnes, Ph.D.

One of Kentucky's newest residents in the past several years is the nine-banded armadillo (*Dasypus novemcinctus*). This southern species is making its way north and I first observed one in Fulton county about 6 or 7 years ago. Last year I received photos of one killed in Larue County and I observed one in Anderson County which would be the furthest north these animals have been reported in Kentucky. This spring I found one in northern Hopkins County. Armadillos are just one of many southern species that are headed north and these are particularly good indicators of a changing environment because at the temperature of 22 degrees the animal shivers continually and is uncomfortably cool. However, if they have a suitable winter nest which is usually located where there is an abundance of leaves and grass for insulation near the base of a tree, the animals can easily tolerate temperatures colder for short periods of time. The burrows range in depth from 3 to 20 feet in length and as long as soil temperatures do not freeze as deep as they are in the burrows, the animals will do just fine. They do not hibernate but can go for long periods without eating. Armadillos are primarily insectivores and will forage in erratic patterns. They are also nocturnal or crepuscular and are most often seen in the early morning or late afternoon time periods. *Photo courtesy: Thomas Barnes*



Dates To Remember:

Don't forget to add these important dates to your calendar! Preregistration is strongly encouraged for all events.

Date:	Event:	Location:	Contact:
August - September 23	Woodland Owners Short Course	various KY counties	859.257.7597
September 19 - 20	Kentucky Wood Expo	Madisonville, KY	502.695.3979

For more information about these programs, visit www.ukforestry.org

News To Use

Budget Cuts - UPDATE

Last issue we provided you with a page of information on impending budget cuts at the state and federal level that would impact woodlands and woodland owners in the Commonwealth. The following is an update on this issue. Unfortunately, not all of the news is good.

State Budget Cuts -

The state budget cuts were significant. However, due to lobbying efforts of concerned citizens, woodland owners, state forest industry and woodland owner associations the Kentucky Division of Forestry (KDF) tree nurseries survived, but not without consequence. Budget cuts were still deep and ultimately the reduction in budgets has to come from somewhere. The following currently applies to the Kentucky Division of Forestry.

- An additional \$373,500 reduction in General Funds for 2009.
- A reduction in workforce, including service foresters that assist woodland owners with forest management planning and technical assistance, and county forest ranger technicians that inspect timber harvesting operations and organize and direct local wildfire suppression crews.
- The budget does still not allow for the replacement of over 80 aged vehicles and over 30 pieces of wildland fire equipment.

The noticeable and cumulative effects of the state budget cuts will be at the least, a delay if not, an overall reduction

of technical assistance provided to woodland owners; less logging oversight and a decrease in the ability to effectively fight wildfires.

The University of Kentucky, Department of Forestry is dealing with budget cuts as well. In some instances, positions that were unfilled were functionally eliminated while others were left unfilled. The Department of Forestry did receive permission to continue the search for a research/teaching forest policy professor. However, one extension position previously held by Dr. Don Graves was lost from the Department. The budget tightening has also caused changes in other teaching, research, and extension programs. For example, some have noticed the increase in registration fees and the lack of the traditional 3-ring binder of resource materials in the Kentucky Woodland Owners Short Courses this summer. More changes will be in the works as Forestry Extension continues to strategically improve the cost effectiveness of educational opportunities for woodland owners.

Federal Budget Cuts -

With the current budget situation resulting in continued resolutions and the upcoming election little is known about changes in the federal budget as it relates to woodland owners in Kentucky. All of the possible changes and consequences that were outlined in the last issue of this magazine are still a possibility. Stay tuned for further information. Engaged woodland owners should be aware of these issues as they will undoubtedly affect assistance to woodland owners, communication and education on woodland issues, and forest health in Kentucky.

Family Woodlands School: a school for sustainable woodland management in Kentucky

Plans are being made for the development of a woodland management school for Kentucky's woodland owners. If you have attended one of the Kentucky Woodland Owners Short Courses this school is for you. It is designed to provide woodland owners that have participated in forestry continuing education programs in Kentucky with in-depth training in woodland management. In technical terms it is a school in sustainable woodlands management. Examples of specific areas of training include how to use new and emerging markets for carbon and biomass for improved management, use of GPS and mapping to improve planning, how to use current cost-share programs to improve your woodlands, training in techniques to improve timber, wildlife and protect the ecosystem. One important aspect of the school is that participants will bring information and materials on their woodlands to the school and will develop detailed and improved plans for their woodlands as part of the school. The school is being developed by Forestry Ex-

tension at the University of Kentucky in conjunction with the Kentucky Division of Forestry and will partner with the same organizations that sponsor our Kentucky Woodland Owners Short Courses. The first school will be conducted next year and surveys are now underway to determine the exact subject areas that will be included and the length and dates for the school. Stay tuned for further information.

Answers to Test Your Knowledge on page 21.

- A. Black Cherry
- B. Locust Leafminer
- C. Wool Sower Gall
- D. Yellowbelly sapsucker
- E. Fireblight



UNIVERSITY OF KENTUCKY

Forestry Extension Office
Department of Forestry
University of Kentucky
216 Thomas Poe Cooper Bldg.
Lexington, KY 40546-0073

NONPROFIT
ORGANIZATION
U.S. POSTAGE
PAID
Lexington, Ky
PERMIT NO. 51



In This Issue....
Environmental
Education Opportunities

Online version at
www.ukforestry.org