



Kentucky Woodlands

Magazine

**Healthy Soils
Global Climate Change
Tree Protection in Yards,
Farms, and Forestry
Plantings**

Volume 6 Issue 2

Kentucky Woodlands

Volume 6 Issue 2 Magazine
August 2011

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

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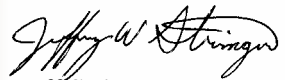
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From the Editors of the Kentucky Woodlands Magazine:

Recent census data has shown that Kentucky is becoming a more urbanized state with a 7.4% increase in population since 2000. This increase of approximately 350,000 people has pushed residents out of the cities and into the rural areas that surround the city. Having the conveniences that the city provides and the natural beauty that the rural areas provide is a perfect combination for thousands of Kentuckians. This area located on the edge between these two areas is called the wildland-urban interface and living on the "edge" is not without its own set of problems. This issue will highlight some of the problems including drastically different soil conditions, tree planting complications and the threat of introducing non-native landscaping into your yard and how that could impact the adjacent woodlands.

Also in this issue, Dr. Tom Barnes has included an article about Global Climate change and what changes we should expect to see in our woodlands in the future. The national champion American smoketree will be introduced and persimmon production will be discussed as well as how to control a "new" invasive plant that is one of the most popular landscape trees in the state – Callery pear.

We hope you enjoy this issue and please feel free to contact us with any suggestions for future articles.


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About the Cover:

The front cover of this issue, as well as the articles, acknowledge the important role trees and woodlands play across Kentucky whether they occur in a rural or urban setting. The image on the left was provided by Dr. Bill Fountain, Extension Horticulture Professor at the University of Kentucky and the image on the right was provided by Reneé Williams, Assistant Editor of Kentucky Woodlands Magazine and Information Specialist Senior in the University of Kentucky Forestry Extension group. Both images depict the prominent place trees and woodlands hold in Kentucky. To learn more about Kentucky's trees visit www.uky.edu/Ag/Horticulture/kytreewebsite/treeprofiles/treelist.htm

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Trees may be of the natural forest, but for the majority of the world's population the closest trees are part of the urban forest. Species found in our cities and towns are also found in natural forests and woodlands but in drastically different environments and often on distant continents. The differences in the environments between natural areas and the communities where we live present a series of interrelated problems. When compared with urban trees, Kentucky's woodlands have a more moderate climate, less intense sunlight and drastically different soils. The properties of the soil environment are usually dissimilar to woodlands and, as a result, present the greatest challenges to sustainable, healthy urban trees.

Urban soils are so radically different from undisturbed soils that the major thing they have in common is what we call them -- soil. Urban trees provide us with benefits that make our communities livable, yet we relegate them to an existence confined by human needs and habits. Limited soil volume along with changes in soil chemistry and physical characteristics limit the ultimate size and life span of our urban trees, also limiting their effectiveness in making our homes, be they hamlets or mega cities, the best possible places to live and raise our families.

Changes in Soil Volume

The volume of soil available for tree roots to explore in search of water and mineral elements has a significant impact on the ultimate size and longevity of the tree. The question of "How much soil is necessary for a tree?" can only be answered when we first answer the question, "How big do you want the tree to get?" and "How long do you want it to live?"

The rule of thumb is that a minimum of three cubic feet of soil is required for each square foot of crown projection (number of square feet of canopy in silhouette). This minimum amount of soil will require regular irrigation and fertilization. Less soil than the minimum requirement will not allow the roots to physically anchor the top during windstorms. Limited amounts of soil will not provide a sufficiently large reservoir for the water and mineral element.

Native, undisturbed soils are characteristically expansive, allowing multiple trees to root into the same common area. Because urban real estate is expensive, designers try to maximize every square inch for development. One way they do this is by spacing trees far apart in small tree pits. The result is solitary trees where each is exposed to lower humidity, more wind and more intense sunlight than masses

Healthy Soils: The Key to Healthy Trees in Our Communities

by William M. Fountain

Photo courtesy: William M. Fountain



of trees in woodlands. To add insult to injury, the soil urban trees are forced to grow in is nothing like that in woodlands. The volume of the soil is important, but the quality is even more so.

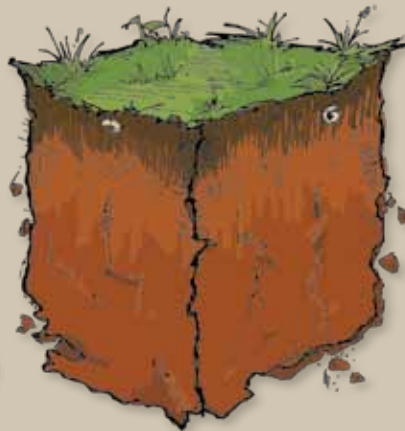
Soil Structure

Soil is ALIVE!--at least soils suitable for growing large, healthy trees must be alive. Microorganisms, insects and other invertebrates are responsible for developing soil structure. Structure is how something is put together. We recognize good quality soil as naturally granular or crumbly. The structure of many urban soils has been altered by equipment scraping and compaction to the point where it more closely resembles pudding when wet and concrete when dry. Roots have to push through this substance in order to grow and develop. Roots travel through the path of least resistance. In native, undisturbed soils, this path is through small cracks that open and close with changes in moisture. Roots also follow old worm holes and insect burrows and even grow through the same paths where roots of now dead plants once grew. All of these cracks and crevices are lost when soil is pounded by foot traffic and equipment.

Compacted urban soils can have a weight-to-volume ratio, called bulk density, that is higher than concrete. Not only is it difficult for roots to physically push through these hard, compacted soils, it may be impossible for them to function like normal roots. Compacted soils lack the pores that would naturally be filled with water and oxygen. In order to grow and absorb water and mineral elements from the soil, roots must have an abundance of oxygen in the soil. Compacted soils trap carbon dioxide and lack sufficient oxygen. Roots that cannot physically grow through the soil and absorb water and mineral elements are not able to provide the structural support for the tree or supply water and mineral elements for growth. These physical characteristics of urban soils make them distinctly different from native, undisturbed soils.

Chemistry

Along with the physical alterations in urban soils, chemical charac-



The color of soil can tell a great deal about the amount of organic matter in the soil. The woodland soil (left) is a darker color indicating much more organic matter than the urban soil (above). Woodland soils have more structure than urban soils because of an abundance of invertebrates and lack of disturbance. Compacted urban soils lack adequate pores which are naturally filled with oxygen and water. These compacted urban soils hinder root growth and trap carbon dioxide.



Urban trees are often severely restricted because of soil limitations.

Photo courtesy: Bill Fountain

teristics also change. Woody plants require 19 essential elements to survive. Most Kentucky soils have an abundance of these elements, and many are among the most fertile in the world; however, when soils become too acidic or too alkaline these elements can be changed to chemical forms that are impossible for the plant to absorb, or elements may become so readily available that they are toxic to the tree. The result is stunting of the roots and shoots and yellow foliage that cannot photosynthesize and carry out the other processes necessary for growing, flowering and maturing fruit. Weakened plants are less efficient at being able to fend off disease and insect pests.

Alkaline soils are more common in our urban areas than soils that are too acidic. Two elements, calcium and sodium, result in soils becoming too alkaline. The most common source of sodium is deicing salt (sodium chloride) used in winter to keep streets and sidewalks safe and passable. After streets are salted, snow melts and vehicular traffic quickly returns to normal speeds. High speeds result in splashing and minute droplets of salty water traveling long distances. The remaining salty slush is either splashed or plowed onto median strips. Tree islands in parking lots and along streets make a convenient place to pile snow and ice out of the way of cars and pedestrians. As the snow melts the sodium is absorbed onto clay particles, making them alkaline, sometimes reaching a pH of 8.0 or 9.0.

Calcium is the other chemical responsible for making our urban soils too alkaline. Most of the excess calcium comes from the lime in concrete and mortar from construction. Soils become contaminated with excess calcium as lime leaches out of mortar joints on new masonry construction or washes out of the delivery chutes of concrete trucks.

Once damaged, soils in the urban environment that were once fertile and productive cannot be easily re-



stored to their original state. Remediation is both more expensive and time consuming than protecting the soil from compaction and contamination. Where contaminated soils are too alkaline we must select species that are tolerant of a high pH



Photos courtesy:
Bill Fountain



and accept greater maintenance expenses and shorter life spans. Quality trees in urban areas don't cost money; they yield economic benefits. Healthy trees in the urban environment make our cities livable but they must be designed for and protected. Inserting trees into a previously treeless urban area requires knowledge of the cultural requirements of potential species and selection of only those which are tolerant of an altered environment. The right tree must be installed in the right place. Equally important to designing the urban environment is providing protection from urban pressures by using best management practices that will ensure that trees will not just remain technically alive but will grow and thrive, yielding all of the intended environmental and aesthetic benefits.

It is well documented that trees greatly enhance the urban environment making it much more livable. Unfortunately, urban trees are often given too little space to grow and subjected to harsh environments that drastically reduce their ultimate size and life spans. Trees that are given adequate room to grow and are provided some basic protections, can provide many benefits to our towns and cities for many years.

About the Author:

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FORESTRY 101

Tree Protection in Yards, Farms and Forestry Plantings

by Jeff Stringer

Protecting trees directly after planting and for their first few formative years can be extremely helpful—or required—to ensure survival. In some cases protection may be required for many years. Protection generally includes providing shelter from adverse environmental conditions and protection from animal and human damage. Protection can be costly if large numbers of trees must be protected, so in large scale forestry plantings protection is often not practical. However, for a small number of trees protection may be a very cost effective option to ensure success. Protection is especially warranted for trees that are in urban environments, planted in locations where they are exposed or subject to damage from wild or domestic animals. Following is basic information on some common methods of tree protection.



Trees planted in urban environments are more exposed to the elements during the winter. Wrapping the trees with a commercially available tree bark wrap will help protect them from frost cracking and sun scald.

Winter Exposure

Winter exposure problems can occur to trees of all ages that are planted in the open or widely spaced so they are fully exposed to the elements, including yard or street trees, trees in orchards and wind or shelter breaks and trees planted by themselves regardless of the purpose. When the base or lower main stem of the tree is exposed to direct sun in the winter, two types of damage can occur: frost crack and sun scald.

Frost cracking occurs when temperatures are very low and the base of the tree is exposed to direct sun causing expansion and contraction from temperature changes. Particularly in thin-bark and young trees, the stem can develop vertical fissures. The condition can occur in a wide variety of species and ages under the right conditions. Frost crack can be

made worse by previous injury that causes uneven growth in the stem and uneven expansion and contraction.

Sun scald results from sunlight increasing temperatures of the underlying bark causing the living cells in the inner bark to be more susceptible to freezing during the cold night. The bark tissue dies, causing a wide vertical patch of dead bark that has to heal. Sun scald, like frost cracking, typically occurs on the southwest side of the tree, which has the most exposure to direct sun in the winter months.

Protect trees from winter exposure by following two simple recommendations: Don't fertilize the trees heavily in the fall, and apply a commercially available white paper or reflective tree bark wrap to the base of the trees in the winter. (Remember to remove the wrap as spring approaches.)

Protection from Yard Maintenance

Young and thin-bark older trees are susceptible to physical damage, primarily bark wounding, from lawn mowers, weed eaters, and other types of lawn equipment. Once the bark is knocked off the tree the only means the trees has to fix the problem is to grow callus tissue from the edges of the wound that will eventually cover the exposed dead wood area. If the wound is wide this repair could take a number of years. Protecting trees from equipment injury can be accomplished by various means. Keeping grass and weeds away from the bases of large trees will protect them from mowing and weeding machines. Properly applied wood and bark mulch beds around the tree will



Lawn equipment is one of the biggest threats to trees planted in urban settings. Mulching trees properly will prevent weeds and grass from growing near their bases and eliminate the need to get near them with weed eaters and lawn mowers.

Photo courtesy: Jeff Stringer

work, as do commercially available shredded rubber tire mats. Biodegradable paper weed prevention fabric is also available and can be used by itself or under mulch to help prevent weed growth next to the base of trees. Small trees can also be protected from this type of damage using a tree tube or tree shelter (see below).

Protection from Grazing and Wildlife Damage

Wildlife, both large and small, can significantly reduce survival and growth of planted seedlings. Critters such as voles can girdle seedlings at the ground line. Mulch and thick grass around seedlings can increase this risk. Rabbits can also girdle trees above the ground line and consume buds and terminal shoots within their reach. Of course large animals such as deer browse on buds and terminal shoots especially in the winter. Plantings around or in pastures, paddocks, or other similar areas are subject to physical injury from the animals eating or trampling them. Newly planted or first year seedlings normally have high concentrations of nutrients from fertilization in the nursery, making them very attractive to some animals both domestic and wild. Protection from large animals such as cattle, horses, and aggressive animals such as hogs and goats often requires fencing far enough away from the tree so that animals cannot possibly reach the bark.

Tree shelters (tree tubes) can be used to protect newly planted and young seedlings from many wildlife species and some domesticated animals such as sheep. These commercially available shelters act both as a small greenhouse for the seedlings thus enhancing growth and



Photos courtesy: Jeff Stringer



Some tree plantings occur in areas that are subject to wildlife damage. Tree shelters placed around newly planted tree seedlings can significantly enhance the survival rate of the plantings. Tree shelters can offer protection from rodents and deer. Tree shelters will not protect seedlings from cattle, goats, hogs, or horses instead fencing will be required.

protecting from animal damage. The tubes must be placed down into the ground in a manner that will seal them so that air does not enter the bottom of the tube; the trees are then protected from many rodents such as voles and mice. Tubes can be purchased up to 4 feet tall and can also protect the trees from rabbits, deer, and non-aggressive livestock such as sheep.

The tube type shelters were actually designed in Europe to help with planting trees in pastures (silvopasture). Tree shelters require a stake and some time to put into place. One negative aspect of shelters is that in some years the trees can keep growing into late fall and are susceptible to early freezes because they have not hardened off. Some

shelters are designed to be opened during the fall to allow for proper hardening of the tree before winter. It is important to note that if the shelter is totally removed from a seedling before it grows out the top of the shelter it could be susceptible to bending or breaking off if the sheltered seedling has not developed a structurally rigid stem. Once the tree comes out the top of the shelter for several years it develops a tough stem and can stand on its own. It should also be noted that tree shelters are not extremely effective in keeping cattle, hogs, goats or horses from knocking the seedling over, but most wild species shy away from them, with the possible exception of elk and bear.

Newly planted and young trees are also susceptible to browse. Tree shelters are helpful in this regard, but chemical deer repellents can also be used. However, you must keep fresh repellent on the trees throughout the winter and early spring right up to leaf out. Bud caps, plastic mesh or paper tubes or cones, can be placed over terminal shoots to keep wildlife, particularly deer and rabbits, from the buds. The bud caps should be removed during the growing season. Paper cones or tubes can waterlog and cause weight problems; use plastic mesh to avoid these issues.

Some of the more common methods of tree protection have been discussed, however many more are available. Online resources are common, but use only reputable sources such as material from the Cooperative Extension Service associated with land grant universities or the USDA, including the US Forest Service and the NRCS.

Photo courtesy: Jeff Stringer



Plastic mesh can be placed over terminal shoots to keep wildlife, from the buds.

About the Author:

Jeff Stringer, Ph.D., is an 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.

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Kentucky Tree Farm Committee Newsletter

Celebrating an Outstanding Kentucky Tree Farmer

by Cary Perkins, Chair of the Kentucky Tree Farm Committee

Charlie Williams is known around Munfordville in Hart County as “the Tree Man.” He has lived up to his nickname by planting thousands of trees since he was 15 years old. Mr. Williams owns 1,155 acres of land in Hart County, which includes 925 acres of woods. He is one of a handful of Kentucky landowners who is certified as a Golden Tree Farmer (50+ years in the program); his woodland has been a glowing example of sustainable forestry and exemplary land use for more than fifty years. Having been named Kentucky Tree Farmer of the Year in 2006, Mr. Williams has, in each of the past two years, been a finalist for the coveted designation of North Central Regional Tree Farmer of the Year for the central portion of the United States. In 2011, he also received the Arbor Day Foundation's national Good Steward Award which "recognizes landowners who practice sustainability on private lands from which others can learn."

Mr. Williams has a life-long connection to the land. It goes far beyond what could ever be detailed in this short space. He has planted trees every spring for the past 36 years. For more than 50 years, he has selectively harvested timber on every acre of his 925 acres of woods, utilizing a "bottom-grading" system in which only dying, defective, or poor quality trees are harvested. This approach improves the health and vigor of the remaining trees and the forest for the future. Many areas of his property have been harvested in this manner several times as well as having had Timber Stand Improvement (TSI) done. He has even bought and erected an old surplus Division of Forestry fire tower on a knoll near his house from which he can overview his entire property. He has documented 46 different recre-

ational activities from fishing to fire-tower sitting that his friends and family have done on his tree farm.

Mr. Williams uses Best Management Practices in everything that he does. He has an extensive cave system underneath the property and has been very careful to tailor all of his land uses to practices that will protect the organisms that call it home. He is implementing a complete wildlife plan developed by the Kentucky Department of Fish and Wildlife Resources as well as a Forest Stewardship Plan

developed in cooperation with the Kentucky Division of Forestry. His Tree Farm is designated as a Stewardship Forest, and he was named the 2005 Kentucky Forest Steward of the Year. A professional forester supervises the woodland work, and Mr. Williams has also participated in numerous projects in cooperation with the USDA Natural Resources Conservation Service.

As the former Munfordville City Attorney, Mr. Williams has been very active not only in promoting good forestry but in promoting trees and their benefits far beyond his own property. He has hosted numerous farm tours, particularly for school children, to talk about the benefits of trees. He has lobbied the Kentucky legislature for stronger timber trespass

laws and spent his legal career vigorously prosecuting loggers engaged in timber trespass. He has also traveled to Washington, DC to meet and lobby Kentucky's congressional delegation regarding the importance of issues concerning Kentucky's woodland owners. He is an active member of the Kentucky Woodland Owners Association. Charlie Williams is an outstanding Tree Farmer and a wonderful example of the impact one person, with the help of family, friends, and professional foresters, can have.



Photo courtesy: Cary Perkins

Mr. Charlie Williams has been practicing woodland management on his Tree Farm in Hart County for many years. He is one of the few Tree Farmers in Kentucky that have earned the designation of Golden Tree Farmer meaning he has been in the American Tree Farm System program for more than 50 years. Mr. Williams received the national Arbor Day Foundation Good Steward Award for his years of work and has been a finalist for the regional Tree Farmer of the Year Award for the last two years. His positive impact extends well beyond his Hart County Tree Farm.



KWOA benefits Kentucky Woodland Owners

www.kwoa.net

by Henry Duncan, KWOA President

Economically stressed times create undue pressures on the wood industry. Slow-downs in home building and decreases in sales of timber products depress the market for timber ready for sale. The Kentucky Woodland Owners Association (KWOA) lists timber pricing as a key issue of concern.

The KWOA 15-member board of directors represents woodland owners across the state. One of 36 state affiliates of the National Woodland Owners Association, KWOA is also associated with the American Tree Farm System and coordinates with agencies and organizations regarding the latest woodland issues for the benefit of woodland owners.

KWOA's primary goal is to help Kentucky woodland owners attain the best dollar return from their forestry operations while maintaining healthy, well managed forestlands. Overall issues center on promoting economically and environmentally sound forest management, advancing skills of Kentucky woodland owners, serving as an advocate for woodland owners in legislative activities and keeping the public and lawmakers informed about the importance of woodlands to Kentucky.

Current discussions include: developing a timber market informational system, changing the unfair timberland tax procedures, promoting youth interest in forestry and revising KWOA's long range strategic plan.

The KWOA board meets at 10:30 a.m. on the third Thursday of August, November, February and May at the Kentucky Forest Industry Association Building in Frankfort. All KWOA members are invited to attend and participate in these meetings. Woodland owners are encouraged to stay in contact by joining KWOA and the National Woodland Owners Association.

KWOA membership is kept up to date on forestry issues via newsletters, our website, and electronic mailings.

Photo courtesy: Renee' Williams



Absentee owners, urban residents and a new generation of woodland owners

by Karen Marshall, KWOA Newsletter Editor and Web Manager

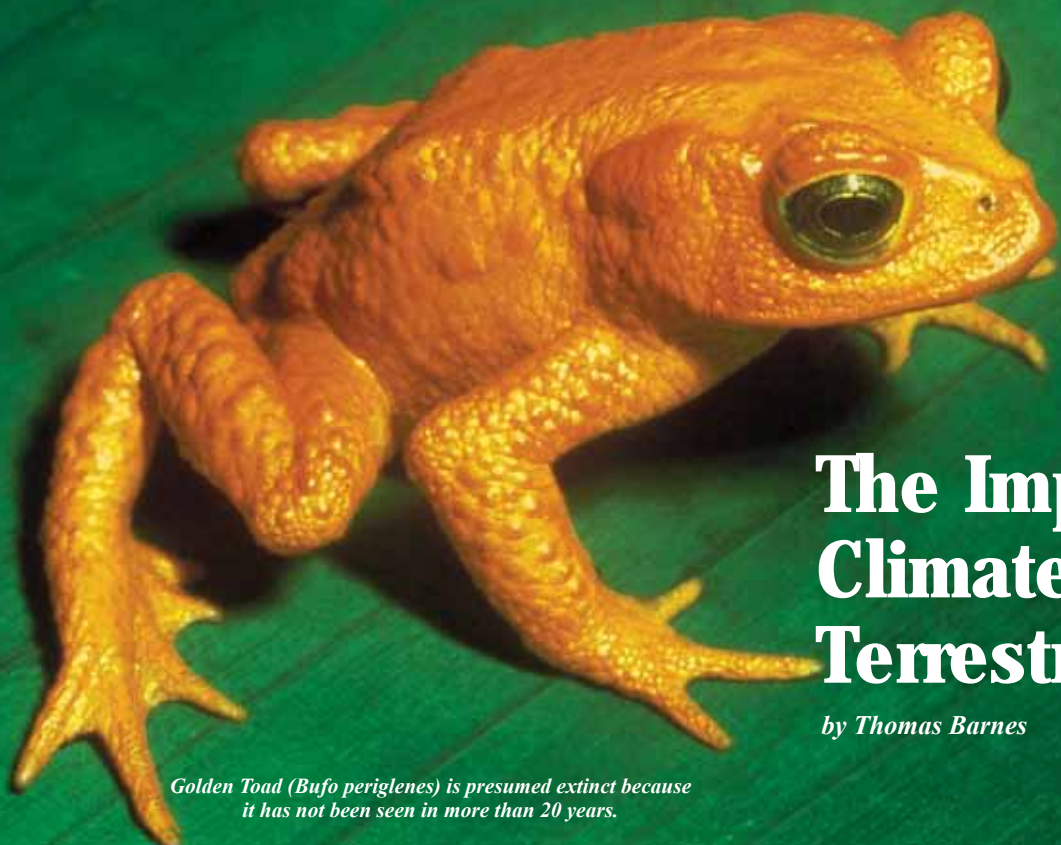
Many Kentucky woodland owners, including today's generation, are absentee owners living in urban areas. Many of these urban woodland owners may have had only an occasional opportunity to visit the woodland home place; they may have had little experience with farming practices and few opportunities to walk through a well-managed woodland forest. They also may have limited understanding of silviculture practices such as timber stand improvement, eradication of invasive species and sustainable harvests. This generational and geographic divide increases the importance of educating a new and different generation of woodland owners about the management of their woodland properties.

KWOA, the Kentucky Division of Forestry and the University of Kentucky's Forestry Extension Department offer information, training, demonstrations and professional advice. These offerings can equip the woodland owners and their successors with the skills that were once passed down in rural communities from one generation to another.

Kentucky is also fortunate to have a Center for Forest and Wood Certification that will provide group certification, allowing several small woodland owners to acquire cost effective certification, including advanced woodland management opportunities.

Woodland owners are encouraged to join KWOA and register for various trainings, field work and conferences to acquire the proficiency necessary to regenerate and sustain thriving woodlands for future generations.

For more information log on to www.kwoa.net



Golden Toad (Bufo periglenes) is presumed extinct because it has not been seen in more than 20 years.

The Impact of Global Climate Change on Terrestrial Systems

by Thomas Barnes

Photo courtesy: C. H. Smith, US Fish & Wildlife Service

The world is changing right before our eyes. Many woodland owners are not aware of how their woodlands are changing, because the change is happening so slowly that we fail to stop and observe nature on her time scale. We humans seem to lack a certain level of patience when it comes to these activities. Nature is infinitely complex and while we can put men into outer space for weeks and months at a time, we are still largely ignorant of how natural systems function and change over time. And our natural systems are changing as a result of a warming climate. For those interested in gaining a further understanding of the mechanisms of global climate change, or what I like to call global climate weirdness because of the widely erratic changes that are happening, the following web resources provide an excellent summary of the scientific evidence for climate change based on peer-reviewed scientific literature: www.ucsusa.org/global_warming/ and www.pewclimate.org/. The purpose of this article is to provide a brief overview of what is currently happening to terrestrial ecosystems as a result of a warming world.

The future impacts of climate change are difficult to predict because of many variables that impact complex natural systems, including climate, soil processes, movement and migration patterns, dispersal mechanism, and the ways individuals and species compete with one another. However, we do know that we are experiencing some of the "predicted" effects today. This is evident from the greater and more variable weather extremes that have given rise to increasing droughts; intensive, heavy precipitation events; and more days with extreme temperatures—all of which global climate change models predict. It would be fantastic to show the impacts of these changes on Kentucky's natural resources, but Kentucky lags far behind other states with

respect to conducting research on the present and future implications of climate change. However, significant peer-reviewed scientific information from around the U.S. and the globe is important to Kentucky, and weighty observational information is available from here in the Commonwealth.

First and foremost, the world will not end if we do nothing to slow or stop the effects of global climate change. It most certainly will be a different world, and there will be winners and losers. For example, research shows that red fox (a generalist) numbers are increasing and arctic fox (a specialist) numbers are dwindling as the bigger and more aggressive red foxes move into tundra areas that have warmed. If we continue on the current trend we can anticipate a general loss of between 15 and 37 percent of known plants and animals by the year 2050; most studies predict species loss in the 20 to 30 percent range. Not only will individual species become extinct, entire ecosystems such as mangrove swamps and salt marshes will be lost. Even if we were to curtail greenhouse gas emissions today, models all indicate that the impacts of climate change will proceed for several decades because of the time scale and the delayed effects of climate change.

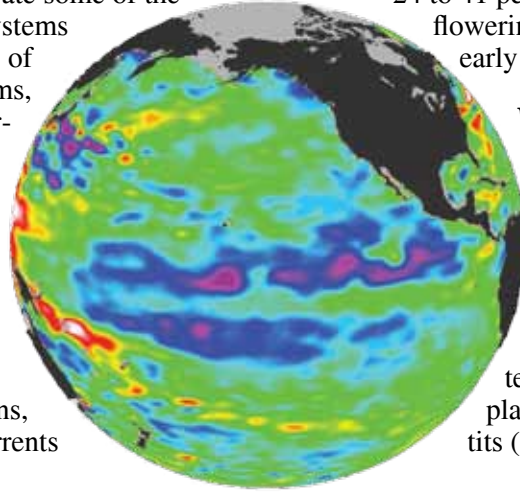
Since climate change is happening as you read this article, just what are the



Salt water marshes like the one above could be lost due to global climate change.

Photo courtesy: Billy Humphries, Forest Resource Consultants, Inc., Bugwood.org

impacts of climate change that we are experiencing at this point in time? The remainder of this article will discuss the current effects of climate change on plants, forests, birds, and amphibians, which demonstrate some of the strongest impacts in terrestrial systems from climate change. The effects of climate change on oceanic systems, particularly coral reefs and fisheries, are even more dramatic as ocean acidity has increased by as much as 38 percent from the 1700s, having serious implications for all oceanic life. In addition, climate change is affecting ocean temperatures, the supply of nutrients from the land, ocean chemistry, food chains, shifts in wind systems, ocean currents and extreme events such as cyclones, which in turn affect the distribution, abundance, breeding cycles and migrations of marine plants and animals, which millions of people rely on for food and income. The effect of climate change also impacts el Niño and la Nina events, which affect terrestrial short-term weather patterns in North America.



The effect of climate change impacts El Niño and La Nina events, which affect terrestrial short-term weather patterns in North America. This image shows a La Nina, the blue area in the center of the image along the equator, which persisted for more than a year in 2007-2008.

Photo courtesy: NASA Jet Propulsion Laboratory

What would the famous naturalist, Henry David Thoreau have to say about what is happening with the wildflowers in Concord, Massachusetts, his hometown? They are flowering earlier just like plants are doing in many places around the world. Research has shown that wildflowers are blooming an average of seven days earlier than when Thoreau wandered around the woods and forests. Even in Kentucky, naturalists have observed wildflowers blooming earlier, often by as much as several weeks. Twenty five years ago the peak of the spring wildflower season was generally the last week in April, today it is early to mid-April and in western Kentucky; the peak of the spring flowering season is done by mid- to late-April. Other empirical data indicate that increasing temperatures are affecting the timing of plant growth, development and flowering, even in unlikely places such as the American southwestern deserts, where spring blooming shrubs are flowering 20 to 41 days earlier, lilacs flowering 7.5 days earlier, honeysuckles 10 days earlier; 15 percent of all wildflowers are blooming earlier. In New York, 6 of 15 wildflowers studied bloomed an average of 20 days earlier than in the past 50 years and no species



One sign that the climate is changing is that wildflowers are blooming earlier. In Kentucky, naturalists have observed wildflowers flowering up to several weeks earlier.

Photo courtesy: Thomas Barnes

was found flowering later. Ten species of Wisconsin woodland flowers bloomed earlier, and 15 species trended toward flowering earlier. In the northern Great Plains region, 24 to 41 percent of hundreds of native species shifted flowering times; most of them flowered unusually early as a result of warming temperatures.

Why should we worry if plants flower earlier?

On the surface it appears that plants adapting to warming temperatures is positive. But that casual observation is made without the understanding that species adapted to using that particular plant may not be able to adapt, particularly in terms of pollination, seed dispersal or other plant-animal interactions. One study of great tits (a bird common to the Netherlands) shows that warmer springs result in a mismatch of peak food availability and hatchling requirements. The peak availability of the insects the birds eat is occurring nine days earlier, and the result has been a decline in the number of offspring surviving, which has led to population declines. Some evidence indicates that this population may be adapting to a warming planet, but the bird's long-term survival will depend on whether enough of the population can remain productive for the population to recover.

Mis-timing of food resources and reproductive success has also been documented for the Pied flycatcher. These are among the most studied songbirds in the world. During the past two decades, some populations have declined by 90 percent as a result of the birds arriving from the wintering grounds, nesting and beginning to raise young only to find that the caterpillars are no longer available to feed the young.

How else is climate change affecting birds in North America?

Generally speaking, the range of migratory birds is moving north, and a recent Audubon study found that nearly 60 percent of 305 species have shifted their ranges north by an average of 35 miles. In addition, studies from around the globe have documented that climate change is altering migration timing; some species have abandoned migration altogether, and reproductive failures have been shown to be related to changes in insects and habitat availability. In addition, birds such as the American tree swallow; snow and Canada geese and Mexican jays are nesting earlier. So why care if the nesting dates change, or range or habitats change? The birds will adapt, won't they? Perhaps, but perhaps not, because ecological systems are complicated.

A good example of how climate change is altering bird species ecology is the grey jay. The grey jay is a common resident of the boreal forest in North America. It hoards food to get through long, cold winters. The grey jay is now in serious trouble because warmer winters are causing their

food stashes to rot; the birds are also experiencing food poisoning from eating rotten food. This situation has tremendous ecological implications for the long-term survival of this species and demonstrates how the disruption of one single component in the bird's

life history has a ripple effect. Because these birds come into the reproductive period in less than prime condition, and because they typically mate for life, there are fewer permanent mating pairs. Now 50 percent of them re-mate, which means reproductive problems for the entire system as younger, more inexperienced birds mate, creating nest failures, which leads to more re-mating, which leads to more nest failures, which results in breeding chaos. The results of the 25 year study indicate that birds in the southern range, including southern Canada, Maine, Vermont, and the Rocky Mountains, may become extinct.



The grey jay is in trouble because warmer winters are causing their food stashes to rot and the birds are also experiencing food poisoning from eating rotten food.

Photo courtesy: Terry L. Spivey; Terry Spivey Photography, Bigwood.org

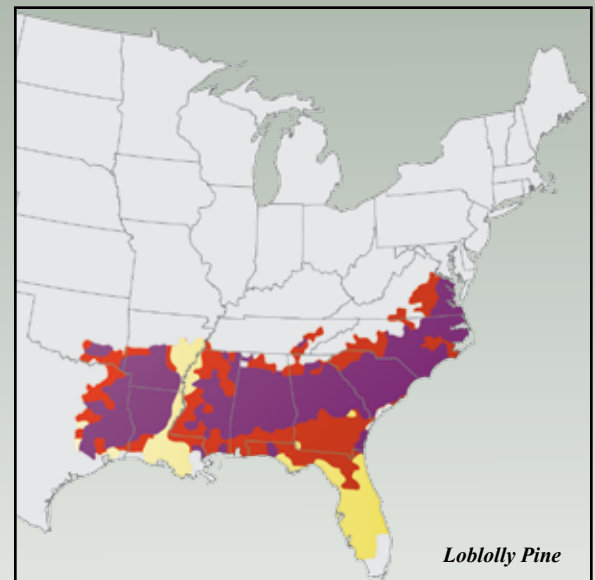
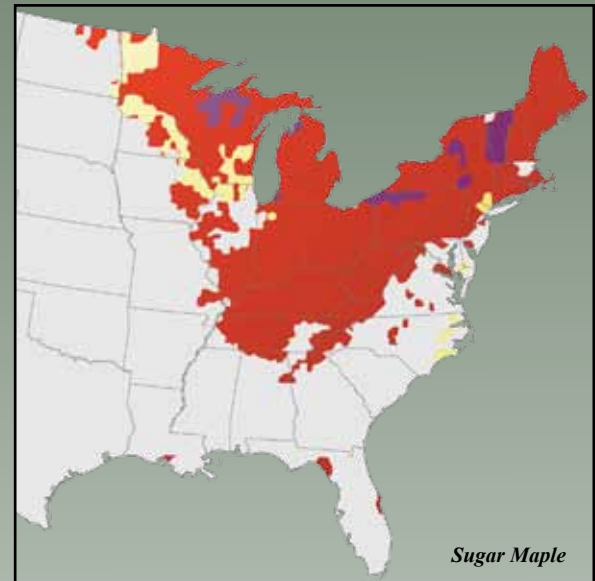
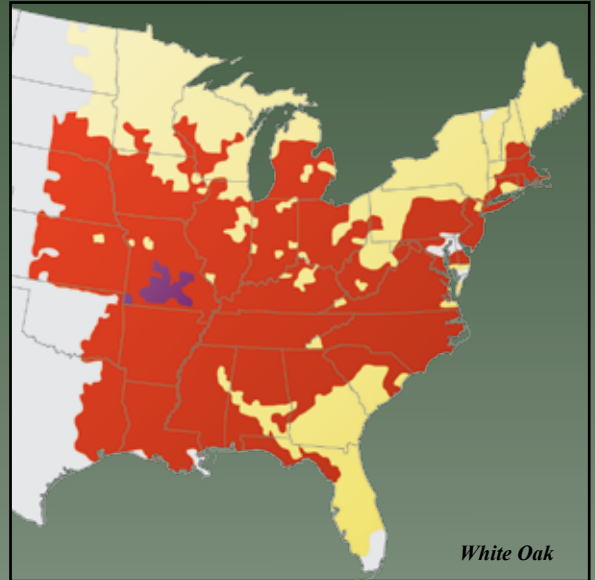
How is climate change affecting forests?

There is no doubt that changing temperatures and precipitation patterns will alter forests. On the positive side, climate change in the short term is increasing forest productivity by 10 to 20 percent and increasing carbon sequestration, but the long-term effects tell another story. Other factors such as pollution (acid rain); forest management trends in harvesting, fire control, insects, and other pathogens, and land use changes will interact with climate change, and specifically interpreting the actual impacts of climate change will be challenging. We do know that changing precipitation and temperatures will likely cause geographic shifts in tree species and the composition, productivity, and location of various forest types will change as some will migrate or shift their distributions northward or to higher elevations or will decline. For example, the tree line in the Sierra Nevada Mountains has moved more than 100 feet in elevation during the past 100 years, and the white spruce in the arctic is rapidly declining because warm summer temperatures exceed the threshold for that species. Climate-induced tree mortality is well documented on this continent and throughout the world. Studies have documented more than 20 million ha of forests from Canada to Mexico that have succumbed. Specific examples include more than 1 million ha of spruce in Alaska, more than 10 million ha of lodgepole pine and 1 million ha quaking aspen in Canada and more than 1 million ha of pinyon pine in the southwestern United States. In the eastern United States and Canada, red oak mortality and decline has been documented from Missouri to South Carolina, and a die off of maples in Quebec has also been linked to the effects of climate change.

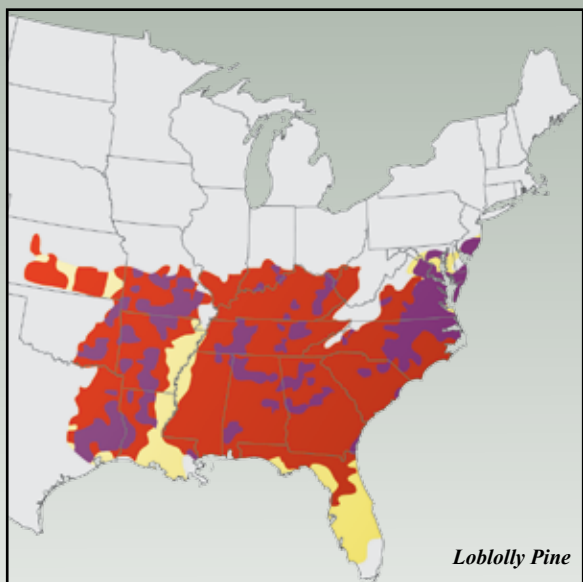
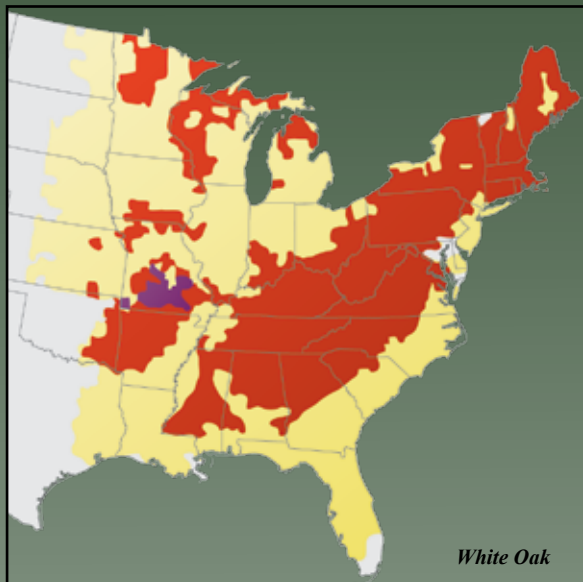
The U.S. Forest Service has made detailed models of three scenarios of increasing carbon emissions and has found that more pine (such as loblolly) and oak will shift their ranges northward. Furthermore, population declines of 10 to 50 percent are predicted for balsam fir, red and black spruce, black, sugar, and mountain maples, paper and yellow birch, and big tooth and quaking aspen. Finally, it is well documented that climate change is increasing the fire risk and insect pathogens in our forests today.

Some ecologists and conservationists point to birds as the "canary

Current Ranges



Projected Ranges



in the coal mine” with respect to how climate change will alter ecological systems today and in the future, but the real canaries are amphibians and reptiles. The harlequin frog and golden toad were once common in mountains of Costa Rica and about 20 years ago, they became extinct. In addition, 67 percent of the 110 species of *Atelopus* frogs endemic to the American tropics met the same fate. The disappearance remained a mystery until scientists discovered that changing climate and increasing temperatures have created the ideal environment for a pathogenic fungus that was the primary culprit. Climate change also affects other ecological factors. An increase in UV-B radiation can destroy or deform amphibian eggs and lead to significant population declines, as is the case with the Cascades frog and western toad in the western United States. Changes in soil temperature affect painted turtle eggs; warmer soil temperatures favor females over males, giving rise to a skewed sex ratio and localized extinctions of this once common and abundant turtle. Butterflies, fungi, mammals, fisheries, and oceanic systems such as coral reefs are all changing along with the climate.

Perhaps we can end on the terrestrial system side where we began, Thoreau's woods. As climate change stresses terrestrial systems and as disturbance regimes are altered, the potential for increased impact by invasive organisms grows larger because invasive plants are well suited to thriving in novel environments and beating out their competitors for resources. It stands to reason that the more we disrupt terrestrial systems, the better environment we create for invasive plants. At Walden Pond, Thoreau's home in Massachusetts, invasive plants are winning the battle because they are better able to adjust their annual activities such as flowering and fruiting. In fact, 27 percent of the native species are already extinct, and 36 percent are so sparse that extinction is imminent.

About the Author:

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These three sets of range maps to the left show where white oak, sugar maple, and loblolly pine currently exist and where they are projected to be in the future. Based on these projections: white oak should be a Kentucky resident in the future; sugar maple will only be found in more northeastern parts of the U.S. and the tallest mountains in West Virginia; and loblolly pine will not only naturally be found in Kentucky but it will become much more important.

The maps show the importance value in the current ranges of the three selected tree species and the maps on the right show the importance value in the projected ranges of the species in the future. Importance value is an index value based on the number of stems and basal area of both the understory and the overstory—it is another way of looking at the particular dominance of a species within its range. The darker the color the more dominant that species is in that area. The projected range maps were generated by summarizing five different global circulation model scenarios and represent a best guess as to how these species ranges may change in the future. To explore other species and to learn more please visit the reference below.

Reference: Prasad, A. M. and L. R. Iverson. 1999-ongoing. A Climate Change Atlas for 80 Forest Tree Species of the Eastern United States [database]. www.fs.fed.us/ne/delaware/atlas/index.html, Northeastern Research Station, USDA Forest Service, Delaware, Ohio.

Woodscaping-

A Natural Approach to Landscaping Your Home

by Diana Olszowy, adapted from Northern Kentucky Urban and Community Forestry Council's Introduction to Woodscaping

Woodscaping is a term used to describe the active management of small woodland parcels or parcels on which property owners wish to create woodlands in urban and rural areas. It combines the principles of landscaping, site modification, designing for aesthetics, creating order with the principles of forestry, encouraging natural systems, creating balance between natural resources and the goals of the landowner. Woodscaping is landscaping, but it works with nature instead of against it.

There is great truth in the saying, "you can't fight Mother Nature." If you did nothing at all to your property, over time it would naturally revert back to a forest taking decades to centuries to become mature. But with a little planning and preparation, you can speed up the process and create your own special forest. The process is simple:

- Kill or remove the turf
- Remove undesirable or defective trees and shrubs (especially exotic or non-native plants)
- Plant new trees, shrubs and groundcovers
- Mulch bare surfaces to prevent erosion

Removing the Turf

Proper site preparation is essential to converting from turf to woods. Turf removal methods can vary widely depending on the size and condition of the site and the resources you have available. Heavy machinery such as a bulldozer may be needed if a large area is to be covered at one time. You can also use a sod cutter or tiller to remove the turf. But if you have existing trees and shrubs you want to save, this method may damage their root systems. Herbicide can be a safe, economical method of turf removal. Non-restricted herbicides can be used effectively by both homeowners and professionals. After the grass dies, you can simply plant your new trees, shrubs and wildflower plants through the dead turf.

Removing Undesirable Plants

Some lawns have other plants growing in them that are not compatible with or suitable for the native woodland ecosystem. Exotic shrubs such as honeysuckle, invasive groundcovers such as English ivy and injured trees that might pose a safety hazard should all be



Photo courtesy: Billy Thomas

Invasive species such as bush honeysuckle (shrubs) and wintercreeper (ground cover) should be controlled before doing any plantings. Invasive species will often outcompete native plants for growing space and resources.

removed as you prepare the area that you intend to plant.

Plant Native Trees, Shrubs and Groundcovers

Planting is usually a late fall or early spring activity. If you plant in the hot, dry summer conditions, tremendous amounts of irrigation will be needed and even then, some of the plants may die. However, all newly installed plants may require some

additional water to help them become established in the new forest.

When planning your forest, think of it as

a three-story building. You have the tallest trees on the top floor,

smaller trees and shrubs on the middle floor and the wildflowers and ground covers in the bottom floor. The size of the trees you plant is only restricted by your budget and your willingness to provide the proper after-planting care. You may choose to plant seedlings. They are inexpensive and easy to plant, but they will take much longer to mature and will require additional maintenance in keeping weeds from overtopping them. Another choice would be to purchase landscape-sized trees that are already 8 to 10 foot tall. They are more expensive and more challenging to plant, but they will provide that "instant" impact many desire. Some native trees to consider include:

Large Trees – oaks, hickories, yellow-poplars, basswoods, Kentucky coffeetrees, elms

Medium Trees – blackgums, hophornbeams, hornbeams, sourwood

Small Trees – dogwoods, redbuds, service berries, hawthorns



Planting the right plant in the right place is very important. Do not plant trees that could grow into power lines as they will eventually need to be severely pruned or removed. Instead consider planting shrubs such as sumac, witch hazel or elderberry that will not reach the power lines.

Drawing courtesy: International Society of Arboriculture, International Society of Arboriculture, Bugwood.org

Shrubs are an important part of the understory of a forest. Like the trees, they provide beauty and food and cover for wildlife. They can be purchased as seedlings and in landscape sizes as well. Some native shrubs to plant are witch hazel, spicebush, sumac, viburnum and elderberry.

Groundcovers include all the small, deciduous plants that can be found on the forest floor. These are wildflowers, vines and other herbaceous plants. Some native groundcovers are goldenrod, aster, blazing star, Solomon's seal, coneflower, bluebells, trillium, Virginia creeper and May apple.



Solomon's seal is an example of a native groundcover.

Photo courtesy: Chris Evans, River to River CWMA, Bugwood.org

What to Expect for the First Five Years

In the first year, generous mulching with a leaf compost and wood chips will keep precious moisture in the soil and deter weeds and erosion. Use light mulch if you have reclaimed your land with wildflower seeding. You may have to provide additional irrigation if natural rainfall is not sufficient. In the next few years, as your trees, shrubs and wildflowers mature, repeated removal of resprouted honeysuckle and other

undesirable plants is the expected maintenance challenge. When your woodland area has established itself, aesthetics will increase dramatically and management requirements will diminish substantially.

Strategies for Being a Good Neighbor with Woodscaping

Not everyone shares the same idea of what is attractive and what is not. If you plan on using woodscaping principles to convert some of your property to a more natural state and the area is near a neighbor's more traditional lawn, then here are some simple things you can do to minimize any conflict:

- Create a border of lawn, hedge, path, etc. to frame the woods and buffer it from the neighbor's property.
- Recognize the rights of property owners to be different.
- Advertise by educating neighbors about what you are doing and what to expect before you start your project.
- Start small to develop your own learning curve and minimize the rate of change for neighbors.
- Civilize your new woods with human touches such as benches, birdhouses and trails in order to maximize enjoyment and link people with the landscape.

For more information about additional woodscaping concepts, please visit the Northern Kentucky Urban and Community Forestry Council's woodscaping publication at www.nkyurbanforestry.org/SitePages/download_files/Woodscaping_brochure.pdf.

Adapted by: _____

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Non-Timber Forest Products

Persimmon

by Shawn R. Wright



*A male persimmon tree in flower.
Photo courtesy: Jerry Lehman*

People that have ever had the native persimmon (*Diospyros virginiana*) usually have one of two responses: they shudder remembering the time they bit into a beautiful fruit thinking it was ripe only to start choking on the astringent pulp--or they smile. For those who have had a positive experience they could be thinking of persimmon pudding, persimmon bars, persimmon bread, persimmon butter, persimmon cheesecake, persimmon cookies, persimmon cream, fresh persimmons and dried persimmon.

If the culinary uses of persimmon aren't enough to catch your interest, persimmon wood has been used for golf club heads, pool cues, drumsticks, shoe lasts, cornbread knives and wooden spoons. It is attractive to bees and produces abundant nectar in good years. The tree is useful for landscaping, providing year round interest in lo-

The leaves of persimmon are dark green and glossy above and are typically three to six inches long. The bark of persimmon is much more distinctive and is characteristically gray-black, divided by furrows into square blocks.



Photos courtesy: Chris Evans, River to River CWMA, Bugwood.org

cations that will accept a 20 to 50 foot tree. The dark green leaves are glossy above and lighter underneath, the bark has a unique gray blocky texture when mature, and the fruit that is not eaten by birds and small mammals persists into early winter. Persimmon don't require spraying because the trees are relatively free from insect pests and persimmon wilt, caused by the fungus *Cephalosporium diospyri*, is the main disease problem of significance. *Coniothyrium* leaf spot can also cause defoliation.

Site selection

Most persimmons are found throughout Kentucky though it is less common in eastern Kentucky. It tolerates most soil types and will grow rapidly on good sites. The trees have a strong taproot that makes them difficult to transplant, but once established they are resistant to drought. The tree grows best in full sun, though it will tolerate shade and can persist in the forest understory. Prolific suckering from the roots can lead to the formation of thickets in forest openings and can help revegetate disturbed locations.

The American persimmon shouldn't be confused with the Asian persimmon (*Diospyros kaki*) or the hybrids that are available. The Asian persimmon is far more common in grocery stores where it sells

for \$1 to \$2 per pound. The fruit is larger than the native persimmon, the tree smaller and less winter hardy. Hybrids of the American and Asian varieties also are available and will survive and produce fruit most years.

Fruit production

Most American persimmon is dioecious; the tree is either male or female. You will need to plant both male and female trees. An easy way to tell the tree sex is by the flowering pattern. Male flowers (see left) grow in groups of two or three, though occasionally are found singular. The female flowers are solitary (right). Supplemental pollination is not necessary because the trees are good nectar producers and attractive to bees. Blossom loss to frost is not usually a concern because the trees are one of the last to leaf out in the spring, and blossoms don't open until the leaves are approximately half-size. You can maximize your production of high-quality fruit in a few ways. Treat the tree as you would other fruit trees. Full sun is important and you should have a soil test done to check pH and soil fertility levels. The trees grow best on a slightly acidic site (pH 6.0-6.5) with moderate fertility. Excess nitrogen can cause fruit drop. Trees can be pruned to a central leader when young but fruit is produced on new wood so do not prune heavily if at all once the tree is established other than to open the canopy and remove damaged wood.

Fruit production will be greatest with one of the hardy Asian persimmons or the hybrids, and you can expect fruit in seven to eight years. Most Asian persimmons are not hardy below 10°F. These trees do not get much larger than 20 feet tall, making them much more suited for an orchard or backyard setting. Fruit can be astringent, like the American varieties, less astringent, or non-astringent. The non-astringent varieties can be eaten while still firm and do not have as much tannin. Asian persimmon may tend to biennial bearing producing a heavy crop in one year and very little the next. To avoid this you can thin the fruit by hand in the 'heavy years'. These also will benefit from having



A female persimmon tree has a solitary flower.

Photo courtesy: Jerry Lehman

more than one variety planted nearby for cross pollination. 'Galley' has been reported to be a good Asian male pollinator but the Asian varieties will not pollinate the native persimmon and the native persimmon will not pollinate the Asian varieties.

For those who have an interest

and skill in grafting, one way to improve a native persimmon planting would be to obtain scion wood or buds from the Asian varieties and graft them on native persimmon root-stock or suckers. Whip or cleft grafting have all been used, as has chip budding. This provides the advantage of a native root stock and the quality of the Asian fruiting wood.

Harvesting begins in late summer until early winter depending on the variety. American persimmon will fall from the tree when ripe. If it is almost ripe and you are losing the fruit to wildlife, you can pick it and place it in a brown paper sack containing a ripe banana. This will hasten the ripening process. The less astringent Asian varieties can be picked when full-colored and firm though pruners may be necessary to remove fruit from the branch.

Persimmon can be easily germinated from seed if it has been stratified in moist media for three months. Pick up a few persimmons this fall when you are out walking in the woods, enjoy the fruit, clean off the seed and place it in some damp potting mix outside. Come spring you should have some new seedlings coming up that can be planted near at hand so you can have easy access to this delicious fruit in a few years.

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Persimmon fruit is a berry that can be very astringent before it is ripe. However once it is ripe it very popular with people and wildlife and is eaten fresh, dried, or cooked in quite a few recipes.

Photo courtesy: Jerry A. Payne, USDA Agricultural Research Service, Bugwood.org

Tracking the Establishment of Invasive Exotic Species in a Timber Harvest

by Kevin Devine, Jeff Stinger, Songlin Fei, Chris Barton

Many woodland owners have significant interest in protecting their properties from invasive species, especially those that are exotic. As would be expected, invasive species are easier to control and perhaps eradicate when they first appear, before they have established and spread throughout a woodlands. Disturbances such as storms or harvesting can provide conditions that are conducive for invasion by exotic species. This research project was undertaken specifically for the purpose of helping woodland owners and foresters to define where and when certain invasive species will become established after a timber harvest. Results will help woodland owners develop appropriate control practices and prioritize areas to look for invasive species after a harvest.

Problem

Kentucky has a number of exotic invasive trees, shrubs, grasses, and forbs that can invade woods where storm damage or harvesting opens the canopy. The strength of invasion can be affected by the distance from a seed source, presence of a suitable seed bed, soil moisture, and landscape position. All of these factors combine to affect the establishment or colonization by invasive species and their spread within woodlands.



Kevin Devine, a UK Forestry graduate student, recording the presence of invasive plants following a timber harvest.

Photo courtesy: Jeff Stinger

land owners and foresters manage for invasive problems.

Research Project

To provide information on invasive species establishment and spread, the University of Kentucky Department of Forestry conducted a research project at Robinson Forest in eastern Kentucky. Because of the invasive species involved and the common forest type where the research was undertaken, the research has widespread application. The study was completed as a part of the larger Streamside Management Zone hydrology project involving eight small watersheds, six of which were subjected to a timber harvest

treatment. Prior to the harvest treatment, the occurrence of 11 invasive exotic species common to the region and occurring on adjacent surface-mined lands was determined for the watersheds in the study. One year after the timber harvesting treatments four of the watersheds (1 control and 3 harvested) were re-sampled to determine the presence of invasive species. The post-treatment inventory recorded the presence of the invasive species and a number of attributes associated with their location including topographic position, soil type and heat load index, degree of soil and duff disturbance, presence of skid trails and where they occurred within the skid trails, abundance of residual standing trees, distance to invasive seed sources, and other important variables. The variables were subject to analysis to determine which invasive species were present and where and what conditions were found to affect their abundance.

Results

Out of the 11 possible invasive species only 2, tree-of-heaven (*Alianthus altissima*) and Japanese stilt grass (*Microstegium vimineum*) were found to have established in enough numbers to warrant further investigation and analysis. This was significant in itself given the large numbers of other exotic invasive species occurring on adjacent surface mine lands. Both species of interest are found statewide and have invasive potential throughout Kentucky. While both tree-of-heaven and Japanese stilt grass increased statistically in the harvested watersheds, they established in different areas. For both species as distance from seed source increased invasive establishment decreased. Japanese stilt grass spread was associated with equipment passing



Tree-of-heaven

Photo top courtesy: Kris Johnson, Great Smoky Mountains National Park



Japanese stilt grass

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

through patches of this grass that was already present prior to harvest on old skid trails; the farther away the less the establishment. Tree-of-heaven establishment decreased with distance from seed-bearing trees on adjacent surface mines. This indicates that eradicating seed sources in and around the area prior to harvesting is important in helping with their control. Also areas within the harvesting where more trees were removed had an increased amount of tree-of-heaven. This effect was not related to soil disturbance or the intensity of the trafficking of the harvesting equipment and appears to be an effect related to increased sunlight. Therefore areas in a harvest that were lightly cut would not warrant as much attention as those that are heavily cut. Generally skid trails were found to contain more invasive species than non-disturbed areas and this study provided specific information on where on a skid trail the species established. Figure 1 shows the occurrence of the two species on different parts of a skid trail. Tree-of-heaven established significantly more on the loose dirt associated with the downslope side of the skid trail (commonly called a berm) compared to the skid trail surface itself. Japanese stilt grass however, was found on all parts of the skid trail and had the ability to colonize the trail bed. This indicates that establishing a ground cover on the skid trail itself as is required by Kentucky's minimum requirements for silvicultural best management practices might lessen Japanese stilt grass invasion or spread while it would have little impact on tree-of-heaven. Increase in these two species was found in association with the harvest, but the numbers present indicated that control was not warranted at this time. However, control of these species will occur when the developing stands reach canopy closure. At that time remaining tree-of-heaven will be individually killed and assessment of Japanese stilt grass will be made and control will be considered if necessary.

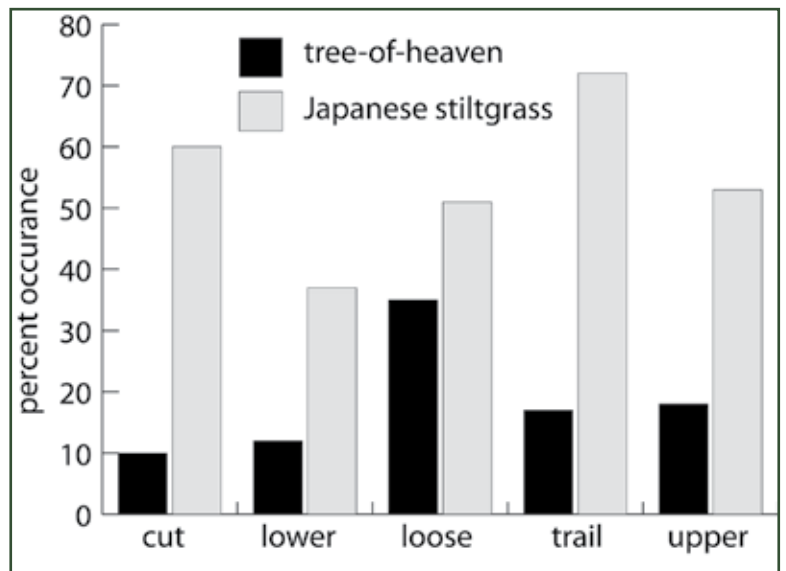
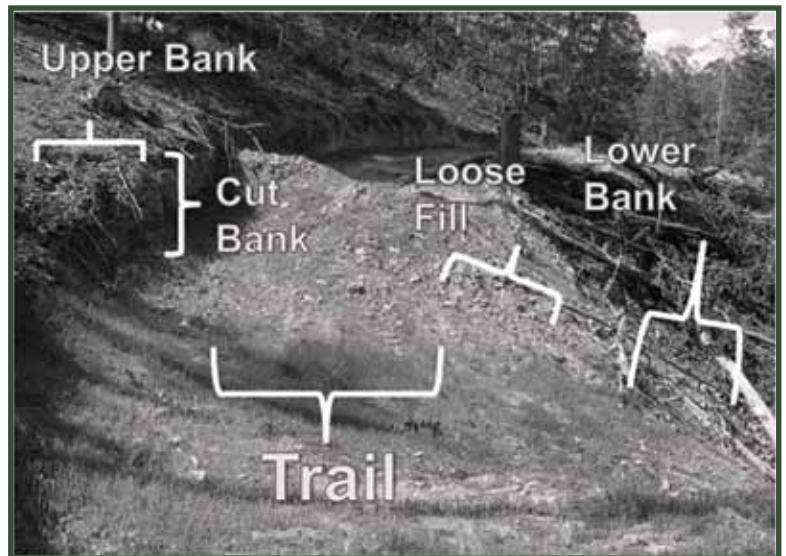


Figure 1. Tree-of-heaven was most prevalent on the loose fill with little invasion on trail surface itself. Japanese stiltgrass was more common and predominated on the trail surface itself.

About the Authors:

This research was funded by the University of Kentucky Department of Forestry and conducted as a Master of Science in Forestry project by Mr. Kevin Devine. The project was directed by Jeff Stringer, PhD, Songlin Fei, PhD, and Chris Barton, PhD, professor and associate professors respectively in the Department of Forestry at the University of Kentucky.

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Understanding Forest and Wood Certification Labels

by Jeff Stringer

As you walk through big box lumber and hardware stores or look through your mail and magazines you will notice a number of certification labels related to forestry, most commonly Forest Stewardship Council (FSC) or Sustainable Forestry Initiative (SFI). If you look closely at these labels and the logos, you will see “Certified Sourcing,” “100% from Well Managed Forests” or similar statements. Understanding what these descriptive terms mean can help you understand how forest product certification works.

SFI Certified Sourcing

This label indicates that the product has come from a mill that has an SFI Certificate. As a part of the SFI program the mill agrees to promote logger training, provide information to landowners to help them protect threatened and endangered species, proper regeneration and use of BMPs and other good forestry practices. If the mill provides or helps ensure that these activities are occurring in the area from which they are procuring wood or fiber, they are able to label their product “SFI Certified Sourcing.” Generally SFI industries in a state will work together to make sure they are providing or satisfying the SFI requirements. The SFI label does not indicate that the wood comes from a certified woodland. If your woodland is in Kentucky (or any U.S. state in North America), you are growing and providing SFI mills with certified sourced wood whether you know it or not.



harvested from FSC certified woodlands. The remaining wood must come from what FSC calls “control wood.” Control wood comes from an area that the mill can prove has a low risk of being harvested illegally; infringing on civil or traditional rights; being harvested from a special or rare forest; being harvested on land that will be converted to other uses; or includes genetically modified trees.



Tracking Certified Wood

One interesting point when discussing the labeling of certified wood products is that these labels may not mean that the products they are associated with contain any wood that actually came from certified woodland. The following is an example of what can happen when an FSC Mixed Sources label is used. A mill buys 100,000 board feet of FSC oak logs. As those logs are received at the mill they are entered into what is called a credit account. The FSC logs are then sawed into lumber and sold without a label. Later the mill gets an order for FSC certified red oak. The mill will be able to fill that order (up to 100,000 board feet) with non-certified red oak lumber and label it as FSC Mixed Source as long as the lumber used was sawn from controlled wood logs. The reason this practice is allowed is that there is no difference in the wood properties of certified and uncertified logs. The difference is in how the woodlands the lumber was harvested from were managed and logged, not in the wood properties themselves.

These examples show how each woodland owner plugs into the certified wood network. Obviously providing certified sourced wood for SFI or controlled wood for FSC is not a problem. However having your woods ATFS or FSC certified puts you in position to garner more attention from mills and buyers based on their demand for a particular label.

SFI Certified Chain of Custody

This label indicates that a percentage of the wood that is in the product represents timber coming from either an SFI or an American Tree Farm certified woodlands. The remainder of the wood in the product must meet the certified fiber source criteria above.



FSC 100%

This label indicates that all of the wood that goes into the product represents timber or fiber coming from an FSC certified forest or woodlands.



FSC Mixed Sources

This label generally indicates that at least 70 percent of the wood that goes into the product represents wood that has been

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Forest Health



The Threat from Our Own Backyards – Callery Pear

by Diana Olszowy with portions reprinted by permission from the Maryland Department of Natural Resources “Invader of the Month” series

Kentucky roadsides are lit up during April with the white blossoms of Callery pears (*Pyrus calleryana*). When the first cultivated variety was promoted to the horticultural industry in the early 1960s, the small flowering Asian tree seemed perfect for fast-growing suburban landscapes. Here was a well-behaved ornamental that could soften the harsh edges of newly built communities with its neat formal shape, explosion of bloom and showy fall color. It was not thorny like many pears, and because it did not self-pollinate, it produced small sterile fruits. But subsequent introductions of additional Callery pear varieties that did allow cross-pollination have turned an April snow shower of white blooms into a blizzard.

Callery pear or “Bradford” pear, as it is commonly called after the first commercial cultivar produced, grows quickly to about 20 to 30 feet tall. The leaves turn a deep scarlet in the fall. The half-inch flowers bloom in early spring, often before the leaves are out. Bradford pears have an upright growth habit and very tight branch crotch angles, making them susceptible to breaking or splitting in even mild windstorms. Even without breakage, the tree is relatively short-lived – 25 to 30 years.

Callery pears were originally cultivated in the early 1900s as root stock for commercial pears. The Bradford cultivar was introduced by the USDA to the horticultural industry for its rapid grown, dense foliage and spring profusion of

pure white blossoms. Although it seemed an ideal street tree, its tendency to split as it reached maturity made it

less desirable. Alternative cultivars less prone to splitting were developed and introduced – trees such as “Aristocrat,” “Chanticleer,” “Cleveland Select” and “Redspire.” With additional cultivars present in the landscape, cross-pollination occurred. Bradford and other once-sterile cultivars began to produce viable

seeds. And that is when the trouble began – the offspring of these once docile ornamentals became aggressive invaders.

Bradford pear seeds are now commonly sown by birds and spread rapidly from plantings into nearby meadows, pastures, roadsides, woodland edges, fence rows and other

sunny habitats. The trees choke out the native grasses, flowers and shrubs that would normally provide critical habitat for many of Kentucky’s birds, insects and butterflies. These seedling clusters are beginning to dominate the landscape, frequently occupying the forest edge space where native serviceberry, redbud and dogwood normally grow.

Invasive pears can be controlled by both mechanical and chemical means, but perhaps the most formidable obstacle to preventing the spread of wild seedlings of Callery pears is their popularity. Callery pear cultivars have been favorites for landscaping new developments and parking lots. In many communities, Bradford or a similar variety is the first



Callery pear trees have been escaping from urban plantings into adjacent woodlands. This advancing problem is becoming more obvious with each passing spring as their white flowers reveal a growing problem.



The white flower blooms of the Callery pear have made it a popular choice for many urban plantings. Unfortunately, the pollinated flowers turn into a fruit that is readily spread by birds.



Photos courtesy: above and left: James H. Miller, USDA Forest Service, Bugwood.org; right: Chuck Barger, University of Georgia, Bugwood.org

and only ornamental street tree. The ecological threat implied by the forests of wild Callery pears along our roadways is most often ignored; the April flower display is welcomed. But this seemingly innocuous invader is changing the native landscape. Public education and wild seedling control efforts will ensure that Kentucky's April floral snows are serviceberry blossom flurries, not Callery pear blizzards.

Table. 1 Control Methods for Callery Pear (*Pyrus calleryana*).

Method	Timing	Details and Cautions	Herbicides ¹
Cut-stump	June - September	Cut large stems and immediately treat the stump tops with herbicide.	Garlon 3A or a glyphosate herbicide as a 25- to 50-percent solution (2 to 6 quarts per 3-gallon mix). ORTHO Brush-B-Gon, Enforcer Brush Killer, and Vine-X are effective undiluted for treating cut-stumps
Hack and squirt	June - September	Make stem injections using undiluted herbicide in cut-spaces as indicated on the label.	Garlon 3A. Subsequent foliar application may be required to control new seedlings and re-sprouts
Basal bark spray	Any time	Spray the bottom 18 inches of the tree or sapling.	Apply Garlon 4 as a 20-percent solution (5 pints per 3-gallon mix) in a labeled basal oil product, vegetable oil or mineral oil with a penetrant, or fuel oil or diesel fuel (where permitted)
Foliar spray	June - September	Thoroughly wet all leaves with an herbicide in water with a surfactant.	Glyphosate herbicide or Garlon 3A as a 2-percent solution (8 ounces per 3-gallon mix)

¹The use of brand names is based on recommendations (US Forest Service) and does not imply endorsement. Read and follow all directions on label for personal protective equipment. Follow label directions and precautions in all cases, including where and how the herbicides can be used. Label information supersedes any published reports or recommendations contained in this publication.

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www.KyForestHealth.org

A Key to Important Diseases of Common Deciduous Kentucky Landscape and Forest Trees

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The University of Kentucky College of Agriculture and the Kentucky Division of Forestry have teamed up to release a key to more than thirty of the most common diseases on more than ten common Kentucky trees. In addition, more than twenty internet links are included that may be helpful for learning to recognize tree diseases in more detail.

The key can be found at <http://forestry.ky.gov/foresthealth>

Photo courtesy: Joseph O'Brien, USDA Forest Service, Bugwood.org



Kentucky Champion Tree Program

An Uncommonly Rare Treat – American Smoketree

by Diana Olszowy

Most would scratch their heads in disbelief if they knew Kentucky is home to the National Champion American smoketree (*Cotinus obovatus*), not because it is the largest specimen of its kind, but because most have never heard of it. Some folks may have been lucky enough to see its cousin the smokebush and are familiar with the brilliant fall coloration it displays, but a tree version? This uncommon eastern U.S. native is a member of the sumac family (see Kentucky Woodlands Magazine – Vol. 5, Issue 1 for more information about sumacs) hence the showy fall colors. Unfortunately, smoketrees are also in the same family as poison ivy) and even it can display showy fall foliage. Smoketrees typically reach approximately 25-40 feet in height and usually obtain the same in crown spread. The National Champion is located in Lexington Cemetery in Fayette County and measures a whopping 101 inches in circumference and has a height and crown spread of 42 feet. This champ displays four- to five-inch-long leaves that are pinkish-bronze when young, mature to a lush, dark blue/green color and then in the fall, change into gorgeous shades of yellow, red, orange or purple, best described by a little five-year-old girl who called it the “skittle tree.”

The flower of American smoketree is another outstanding feature

of the species. The misty flower sprays resemble puffs of smoke emerging from the ends of branches. They bloom in early spring, usually between April and May, and are pollinated by insects. Smoketree is dioecious, which means that male and female flowers are borne on separate trees. Smoketree produces a small drupe and is a preferred food among native finches. Historically, the wood was used during the Civil War to make yellow and orange dyes which caused the tree to be almost harvested to the point of extinction. Smoketree is tolerant of a wide range of adverse urban conditions – wet soil, wind, drought and compacted soil. Plants grow well and are native to high pH, alkaline soils and should be located in full sun or partial shade. Best flowering, form and overall attractiveness is achieved in full sun. This species is relatively trouble-free given appropriate cultural conditions; however, it shares the brittle wood typical of other members of its family (Anacardiaceae), resulting in occasional storm damage.

If you are lucky enough to find an American smoketree in your local nursery garden center, I would suggest you snatch it up because you will indeed possess an uncommonly rare treat that will make your neighbors green with envy not just once during the year, but twice - in the spring and fall.

Lexington Resurrects Champion Tree Program

The city of Lexington’s Urban Forestry Program teamed up with the Division of Forestry and the Lexington Tree Board to resurrect the city’s Champion Tree Program. Over 80 native species were measured and included in the program. Among these nominees were 16 state champions and three national champions. The group intends to launch a “Benefits of Trees” public relations campaign, and Lexington residents will have the opportunity to visit all of the champs online. A future tree trail will be developed for those champs residing on public properties. For more information on Lexington’s Champion Tree Program, please contact the Urban Forestry Program at www.lexingtonky.gov or for information on Kentucky’s Champion Tree Program, contact Diana Olszowy at Diana.olszowy@ky.gov.

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The national champion American Smoketree is located at the Lexington Cemetery in Fayette County. This native, but relatively rare tree, has foliage that turns shades of yellow, red, orange and even purple in the autumn.

Fall color image courtesy www.cirrusimage.com/tree_American_smoke.htm



The flowering of the American smoketree gives a clue to how the tree received its common name.

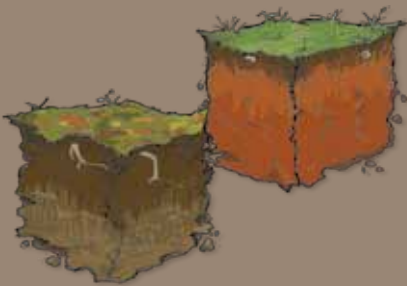
Photo courtesy: www.fashionablegardener.com/2011/06/swath-of-color-smokebush-or-smoketree.html

Test Your Knowledge

Submit your answers at www.ukforestry.org to Win a \$50 Gift Certificate compliments of...



Editor's note: Questions are drawn from the articles in this issue; if you have trouble with any of the answers then please review the articles to discover them. Visit www.ukforestry.org to enter your answers for a chance to win a \$50 gift certificate to Forestry Suppliers. Sorry, but University of Kentucky and Kentucky Division of Forestry employees (and their family members) are ineligible to win the \$50 gift certificate.



1. The compacted soils that are often found in urban environments negatively impact tree growth by each of the following ways EXCEPT...

- a) they trap carbon dioxide
- b) lack sufficient oxygen
- c) are typically more acidic than woodland soils
- d) lack adequate pore space

Hint: See article on page 1.

2. It is necessary to have both male and female persimmon trees to ensure good pollination and eventual fruit production. The flowering pattern of a persimmon tree can be used to tell tree sex. Which of following statements about American persimmon flowering is true?



Hint: See article on page 14.

- a) The male flowers are always singular.
- b) The female flowers are always in groups of three or four.
- c) The male flowers only grow on the highest branches.
- d) The female flowers are always singular.

3. Planting the right plant in the right place is very important. Suppose you have a power line on your property and wanted to plant something underneath it, which plant would be ok to plant under it?



Hint: See article on page 12.

- a) Basswood
- b) Sumac
- c) Red maple
- d) Shellbark hickory

4. The forest industry is receiving additional requests from their customers to supply certified wood products. Which of the following is NOT a recognized forest certification organization?



Hint: See article on page 19.

- a) American Forest Certification Association
- b) Forest Stewardship Council
- c) Sustainable Forestry Initiative



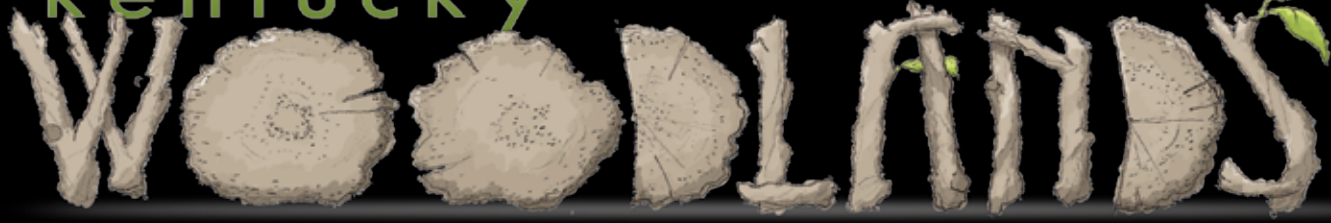
Hint: See article on page 14.

5. Winter exposure problems such as frost crack, sun scald, and early freeze injuries can damage widely spaced newly planted trees (especially thin-bark ones). It is a good idea to do all of the following EXCEPT...

- a) Heavily fertilize trees in the fall and throughout the winter
- b) Apply a white paper or reflective tree bark wrap to the base of the trees during the winter
- c) Use a tree shelter that can be opened in the fall to allow proper hardening before winter

Scan this code with your smartphone or tablet device to submit your answers.





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Forestry Fall Webinar Series Continues

Shiitake Mushroom Production; November 22

Description: If you have lots of hardwood timber on your land and want to try something a little different to bring in some “extra” cash, you might want to consider growing shiitake mushrooms on your land. These are a gourmet mushroom that is well into mainstream markets these days, is relatively inexpensive to get into, and can make some of the smaller diameter hardwoods that you might want to remove in timber stand improvement economically profitable. This webinar will walk you through the process of “drilling and filling” hardwood logs to produce these mushrooms. **Hosting County Extension Offices:** Christian, Franklin, Jefferson, Johnson, Lyon, Mason, Trimble



Shiitake mushrooms

Photo courtesy: Joseph O'Brien, USDA Forest Service, Bugwood.org

Photo courtesy: Thomas Barnes



Cottontail rabbit

Wildlife Damage: Control and Management; November 29

Description: This training session will focus on what homeowners and landowners can do to alleviate wildlife damage issues around the home and farm. Topics discussed will include what constitutes legal use of wildlife control products and home remedies; management of typical problems including moles, voles, deer, birds on structures and in agricultural crops; and sources of assistance.

Hosting County Extension Offices: Bullitt, Christian, Elliott, Franklin, Jefferson, Johnson, Letcher, Lyon, Mason, Mercer, Ohio, Rowan, Trimble

The webinars are free, but please pre-register with the hosting county office. For more information visit www.ca.uky.edu/forestryextension/fallwebinars.php

UK Forestry Extension Blogs

Check out the blogs from UK Forestry Extension. For the opinions and analysis of issues important to forestry and woodland owners in Kentucky as well as information about native plants and wildlife visit <http://kentuckynativeplantandwildlife.blogspot.com> and <http://ukforestryextension.blogspot.com> (or find them at www.ukforestry.org to access them).



Upcoming Dates To Remember:

Date:	Event:	Location:	Contact:
November 22, 2011	Fall Webinar Series: Shiitake Mushrooms	See above for Extension Offices	859.257.7597
November 29, 2011	Fall Webinar Series: Wildlife Damage	See above for Extension Offices	859.257.7597
December 1, 2011	Kentucky Farm Bureau Forestry Conference	Galt House in Louisville	502.495.5000

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

NEWS TO USE

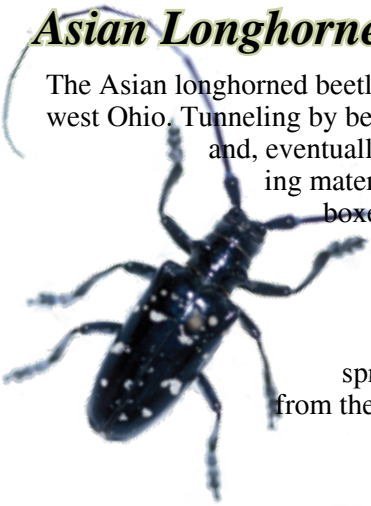
Forestry License Plate

A special license plate is now available promoting forestry in Kentucky. The plate has already been approved by the state and the Kentucky Forest Industries Association (KFIA) is in the process of collecting the 900 forms required for the plate to be made. The plate will promote forestry while raising funds for Log a Load for Kids and the William H. Steele Scholarship Fund which supports a forestry undergraduate student. Once 900 applications are received KFIA will submit them for production and a card will be issued telling the applicant the plate is available at the local county clerk office. To apply for a plate simply call 502.695.3979 or visit www.kfia.org



Asian Longhorned Beetle Found in Ohio

The Asian longhorned beetle (ALB) has been attacking trees in the United States and was recently discovered in southwest Ohio. Tunneling by beetle larvae girdles tree stems and branches. Repeated attacks lead to dieback of the tree crown and, eventually, death of the tree. ALB probably travelled to the United States inside solid wood packing material from China. In the United States the beetle prefers maple species (*Acer spp.*), including boxelder, Norway, red, silver, and sugar maples. Other preferred hosts are birches, Ohio buckeye, elms, horsechestnut, and willows. Occasional to rare hosts include ashes, European mountain ash, London planetree, mimosa, and poplars. A complete list of host trees in the United States has not been determined. Currently, the only effective means to eliminate ALB is to remove infested trees and destroy them by chipping or burning. To prevent further spread of the insect, quarantines are established to avoid transporting infested trees and branches from the area. For more information about Asian longhorned beetle visit www.na.fs.fed.us/fhp/alb/



Fall Forest Fire Hazard Season

The fall forest fire hazard season in Kentucky officially started on October 1 and extends to December 15. As of October 4, 2011, 670 wildfires have burned more than 14,400 acres Kentucky. Most of these fires were due to arson, in fact, over 60 percent of wildfires in Kentucky in the last five years have been intentionally set. Citizens who have information or witnessed suspected arson activity are asked to call the nearest Kentucky Division of Forestry office, State Police post or the Target Arson Hotline at 1-800-27-ARSON.



Test Your Knowledge Answers from KWM Vol. 6 Issue 1

1. b) Congratulations to R. Casner of Woodford Co. He was randomly chosen from the entries with the correct responses from the last quiz.
2. d)
3. c) Thank you Kentucky Woodland Owners Association for donating
4. b) \$50 gift certificates for Test Your Knowledge for the 2011 issues!
5. a)

Visit www.ukforestry.org to submit your answers to this issues' quiz for a chance to win a \$50 gift certificate to Forestry Suppliers. The answers to this issue's questions will be provided in the next issue of the magazine.



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Photo courtesy: Renee Williams

Don't forget to...

- Submit your answers for the **Test Your Knowledge** section. You could win a \$50 Gift Certificate (sponsored by KWOA).

Do it all at www.ukforestry.org

On-line version at
www.ukforestry.org