

A newsletter from the Center for Agroforestry in conjunction with the Forest and Woodland Association of Missouri http://www.centerforagroforestry.org/pubs/newsletters.php

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Common Hardwood Response to Dicamba and 2,4-D

By Brian Dintelmann, University of Missouri Weed Science

The commercial release of dicamba tolerant soybean and cotton technology (Xtend) has given farmers additional methods for controlling problematic broadleaf weeds such as waterhemp that are commonly found in Missouri soybean fields. In the near future, Enlist technology will be released which confers resistance to 2,4-D in cotton and soybean. The adoption of dicamba and 2,4-D tolerant technology will lead to increased applications of these herbicides. Increased applications of dicamba and 2,4-D throughout the growing season on a larger number of crop acreage will likely increase the risk for off target movement of dicamba and 2,4-D to nearby sensitive broadleaf plants. Not only is this a concern for neighboring soybean farmers who do not plant Xtend soybeans, but is also a concern for specialty crop growers, foresters, and homeowners.

The influence of off-target movement of dicamba and 2,4-D on non-tolerant soybean has been extensively studied, however, limited research has been conducted to determine the sensitivity and impacts of these herbicides on various hardwood tree species. In an effort to fill this need, weed scientists at the University of Missouri conducted a research trial in 2017 to investigate the sensitivity of various hardwood species to driftable fractions of 2,4-D and dicamba. Some of the hardwood species that were included in this study included black walnut, pecan, pin oak, and others.

The results of this study indicate that different species vary greatly in their sensitivity to 2,4-D and dicamba. For example, black walnut trees exhibited extreme sensitivity to 2,4-D but were fairly tolerant to dicamba. Although the risk for damage to black walnut trees from dicamba is minimal, it is important to recognize that at high enough rates, injury can still occur (Figure 1). Conversely, 2,4-D caused severe injury to black walnut trees. At sufficient doses, 2,4-D caused necrotic growing points and ceased new growth, in addition to causing lower stem cracking. The effects of 2,4-D did not create a large amount of visual leaf response but did cause more severe damage to the plant overall. Pecan trees are moderately sensitive to both 2,4-D and dicamba. Pecan trees exhibited more visual injury in response to dicamba compared to 2,4-D. However when driftable fractions of glyphosate were included with the 2,4-D or dicamba (as would occur with most agricultural applications), pecan trees experienced more injury from 2,4-D + glyphosate compared to dicamba + glyphosate. The take home message is that pecan trees are likely to exhibit some degree of injury if they have been drifted on with a high enough concentration of either dicamba or 2,4-D.

Oak trees are another common hardwood species that can be affected by drift from dicamba and 2,4-D. Results from this study indicate that oak trees were found to be moderately sensitive to dicamba and extremely sensitive to 2,4-D. Similar to walnut trees, oaks did not show a great degree of leaf symptomology from 2,4-D treatments but exhibited more necrosis and death of the shoot tip as well as stem cracking (Figure 3, on page 7).



Figure 1. Dicamba injury on Black Walnut tree

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<u>2</u> Winter Frost to Spring Fire

By Rebecca Landewe, The Nature Conservancy

With winter days growing longer, spring will be around the corner soon. This late-winter window is a time when many landowners are preparing for the new spring growth through the use of an increasingly popular management tool – prescribed fire, also known as controlled burning.

Fire is an important component of natural community management in Missouri, as it was a regular part of the landscape before European settlement. Many plants and plant communities are dependent on fire to thrive. Open woodlands, which are characterized by widely spaced trees and an abundance of native grasses and wildflowers in the understory, require fire to maintain their character. These woodlands, as well as glades, prairies, and other grasslands benefit from the nutrient cycling and reduced leaf litter that a controlled burn can provide. Turkey, quail, and other grassland birds respond well to the food and habitat fostered by the use of fire. Controlled burns also reduce the risk and severity of wildfires, improve pasture condition, and can be helpful for treating certain invasive species. Talking with a professional forester and wildlife biologist from the Missouri Department of Conservation (MDC) can help you determine if fire is a good tool for you.

Fire is not a panacea and also comes with some risk. The Natural Resources Conservation Service (NRCS) has a helpful guide that describes steps to conducting a successful controlled burn (https:// efotg.sc.egov.usda.gov/references/public/MO/ PrescribedBurn_InfoSheet_4_08.pdf).



Prescribed burns require careful planning, photo copyright TNC (Tom Fielden)

Resources:

Here are a few things to keep in mind:

- 1. Attend a training MDC occasionally offers a class for landowners to learn more about prescribed fire. See Resources below for events and newsletter sign-up.
- 2. Prepare a burn plan Work with a professional to have a burn plan prepared for your property. It is important to prepare a burn plan that outlines the best conditions for conducting the controlled burn. Humidity, temperature, and wind speed are all critical factors to consider and ensure your burn is safe and meets your management goals.
- 3. Prepare your fire lines (i.e., firebreaks) Wellprepared fire lines are crucial for minimizing the potential for an escape.
- 4. Assemble your crew Having a trained, qualified burn boss to supervise the burn is important (see NRCS guide). There are a few contractors available that can implement a controlled burn on your property. In some areas, neighbors are helping neighbors with controlled burning through local Prescribed Burn Associations. Talk with your local MDC representatives to see if there is one near you.
- 5. Wait for the weather conditions outlined in your burn plan Be ready to cancel your plans if the conditions are not correct or unsafe.
- 6. Notify authorities The day before or morning of the burn, notify neighbors, local fire departments and local authorities about your controlled burn.



Photo copyright TNC (Tom Fielden)

- Missouri Prescribed Fire Council The Council is a group dedicated to promoting and protecting the use of safe and responsible use of fire as a management tool. The website has additional helpful information about prescribed fire: http://moprescribedfire.org/#the-council
 MDC Contacts, http://mdo.ma.gov/regional.gov/tacts?counting.http://moprescribedfire.org/#the-council
- MDC Contacts https://mdc.mo.gov/regional-contacts?county=All
 MDC Events https://mdc.mo.gov/property/fire-management/prescribed-fire
- MDC Newsletter Sign-Up https://public.govdelivery.com/accounts/MODC/subscribers/new

The Beauty and the Beastly Wood Villains

By Lynn Barnickol, Actually Wood LLC and Executive Director, Missouri Consulting Foresters Association

Wood turners, furniture makers, luthiers, architects, and saw millers are likely familiar with spalted wood and seek it for special one-of-a-kind bowls, pieces of furniture, guitars, and other stringed musical interments. Spalted wood is eye-catching, peaking folk's curiosity about the unique figure, and wondering if the woodworker has studied art.

Spalting is a natural condition in most woods. It's formed by competing fungi and is a continuum of decay from its initial or incipient stage of infection to complete destruction of wood. The pale colored hardwoods that frequently become spalted include hard and soft maple, sycamore, birch, cottonwood, hackberry, and beech. The dark lines, white pockets, and pigments of spalted sapwood of most trees can be easily seen. However, in the heartwood of walnut and other dark colored woods, spalting is difficult to see. The extractives in the heartwood of walnut, white oak and other durable woods may slow the spalting process. Spalting occurs in conifers, like pine, spruce, fir, and others.

Certain species of fungi, typically soft and white rots, attack wood causing the pigmentation, white pockets, and zone lines. The competing spalting fungi are destructive and can invade both the wood and live trees that are stressed. The visual image created is that of the lair of a crazy science fiction villain. While the process of rotting is destructive, it is also a process of creating the spalted character in wood that's in the initial stages of decay. As spalting fungal activity progresses, it becomes detrimental to the structure, hardness, and strength of the wood.

The spalting fungi causing pigmentation of wood cells, one of the competing "beastly villains", is a soft rot. The fungi deposits black, red, brown pigments within the wood, most likely in the lumen of wood cells. Sometimes associated with spalting is blue stained sapwood and the pink-red color in boxelder. Those are stains caused by other types of fungi and do not destroy the wood. However, blue stain is an indication that conditions are suited for the growth of many wood destroying fungi. Although blue stain can add character to wood, it's considered a defect in high value lumber grades.

White pockets develop from a white rot fungus, and are another "villain". The feature is whitish as the cellulose of the wood remains after the fungus eats lignin and some of the hemicellulose fraction of wood. Lignin is the natural binder that helps hold wood fibers together. Spalting white rots are one of the fungi that, if left unchecked, results in the destruction of the wood.



Light colored spalted sugar maple accents and contrasts the dark color of cocobolo on the back of an expensive, custom order Taylor Guitar - GC Adirondack/Cocobolo (Shoreline Music Durango, CO).

Appearing as artistically created features, the fine, inky lines and streaks that have eye appeal represent boundaries or zones of competing fungi. Multiple lines are created as the fungi expand through the wood. While the lines and streaks do not rot the wood, the fungi within the zones are guilty of causing rot.

Spalting can be detrimental to sawn wood and the way to combat it is to follow proper handling of the lumber. Processing logs soon after harvest prevents the sapwood from degrading. Keeping large supplies of expensive logs piled at the mill under a spray system literally drowns the fungi.

Once sawed into lumber, it needs to be stickered, so air movement begins the air-drying process. The heat and declining moisture content of lumber being kiln dried effectively bakes the fungi, stopping decay from advancing. Like a reoccurring nightmare, spalting fungi can establish in kiln dried lumber if it is improperly stored where high humidity and temperatures favor fungal growth.



A spalted boxelder bowl featuring black zone lines and pigmentation. White pockets do not appear as the spalting process was halted prior to that stage of the decay process. The pink color located at the lower left is from the boxelder stain fungus. (Actually Wood LLC)





Spalting can be detrimental to stressed trees. Spalting can cause disruption of moisture and nutrient movement in the sapwood leading to additional stress on the tree and its death. Using forestry practices to maintain a healthy forest is the best recommendation for prevention. Planned thinning projects help the retained trees maintain their health and vigor. Potentially stressed trees have compacted crowns that do not receive enough sunlight or those having bare limbs that are in full sunlight and should be in full leaf. Trees wounded by storms or by other causes should be removed as part of a timber harvest or in planned thinning.

If you are thinking of trying to spalt some logs at home, in hopes of getting a premium price, you are more likely to impress timber buyers and loggers with your supply of large diameter, free of defect, healthy trees. Other than firewood logs, foresters have not reported witnessing truckloads of decaying logs heading to a mill for processing into lumber and other valuable products. Discussing the sale of spalted or decaying wood to a buyer or logger is likely to turn the conversation toward locating and subduing the "beastly villain" that has somehow invaded your woodlot.

Spalting logs and freshly sawed lumber on your farm or woodworking shop is tricky, as humidity, temperature, darkness, and time are variables. Providing a source of the fungi is not needed as it's typically in the air. Like raising mushrooms, spalting is a similar process: Control the temperature, humidity, air movement, and keep your project in the dark. The result may only be moldy lumber, or at worst too much rot, making the wood too soft to work. A quick and gambler's luck-of-the-draw method is simple: Place some logs or lumber in a pile of leaves or wet sawdust. Keep the experiment damp and frequently check the tell-tale black zone lines or pockets of white rot and associated pigmentation and stains. Science, art, and luck are needed in creating the spalted condition without allowing soft and white rots to progress to the point of ruining the wood.

If you are thinking of taking up woodworking and want to try using some spalted wood, there are a couple of considerations. There is some danger to your sinuses from processing spalted wood, but it's typically a reaction to dust from lathe turning, sawing or sanding. Using an approved dust mask for woodworking to reduce the possible reaction to dust is best. A second caution using spalted wood utensils is that it's not guaranteed to be food safe. Serving your favorite crackers in a spalted bowl is not a serious problem since spalted wood has been processed, dried, and a food-safe finish applied, the fungi are dead. Additionally, spores are only produced by living fungi that must be in an environment having suitable temperature and high humidity where the moisture content of the wood is above 20 to 30 percent. The moisture content is most homes is in the 8 to 12 percent moisture range. Like Goldilocks and the three bears, the porridge, or wood in this story, cannot be too wet or too dry nor too cold or too hot.

White pockets and the pigmentation that are formed within pen and ink zone lines are the "villains" that provide spalted wood its unique character. Spalted wood is featured in specialty markets for wood turners, accent pieces in furniture, and one-of-a-kind stringed musical instruments and bowls. Its beauty is in the eyes of the beholder. Spalted wood is naturally occurring, is rarely found, in demand, and is the result of environmental conditions allowing fungal activity to work its magic.

Note: If you want to try your luck with spalting some wood the following is a helpful publication called TechLine that is from the US Forest Service Forest Products Lab: https://www.fpl.fs.fed.us/documnts/techline/producing-spalted-wood.pdf Use the key-words: "Spalting Wood" to find additional publications.



Spalted panels on the headboard and side tables add character and interest to a cherry bed set. However, the beauty of spalted wood may not be appealing to some folks. (Amana Furniture Shop, Amana, IA).

Fun Climb at Music Festival Connects People to Trees

Ann Koenig, Community Forester, Missouri Department of Conservation

The second Trees Work tree climb at Roots n Blues n BBQ (a three day music and food festival) was held last October in Stephens Lake Park, Columbia, MO. Ann Koenig, community forester with the Missouri Department of Conservation, partnered with the Missouri Community Forestry Council (MCFC), Roots n Blues, Bucket Media, Adventure Tree, the Columbia Tree Task Force, Tree Keepers, City of Columbia Parks and Rec, and True/False Film Festival to pull off this two day tree climb with 14 volunteers, 12 climbing ropes, one swing that held four people, one tree and a few hundred participants (we estimated 350)! Thank you to all the volunteers who assisted in the Roots n Blues Tree Climb.

Stephens Lake Park Arboretum will be part of the annual MCFC conference tour and Guy Mott, Founder, Director and Lead Instructor of Adventure Tree, will be a conference presenter. You can learn more about the site and the program at the upcoming Annual MCFC Conference, March 13-15, 2018.



Music festival goers peer down from the branches



Mark your calendar for the **26th Annual MCFC Conference** March 12 - 15, 2018 in Columbia, MO

"THE DOLLARS & \$ENSE OF TREES"

The 2018 MCFC conference will be a broad ranging examination of the idea that trees are valued as assets that benefit and support our communities in a myriad of different ways. The conference theme "Dollars and \$ense of Trees" is a word play on this notion as we explore the innumerable methods we assign value and connect to our urban trees.

Examples of topics which will be addressed include: presentations on trees and human health, trees and stormwater mitigation, community food forests, and educational tree climbing. There will also be a special preconference workshop focusing on tree appraisal by renowned Consulting Arborist, James Komen.



Volunteers played a critical role in ensuring safety and fun at the 2017 Roots 'n Blues festival

Two concurrent site visits will be offered for the

conference tour: The Arboretum option will visit Stephens Lake Park. Attendees will get a tour of various plant collections and learn how the park recently earned arboretum accreditation. The urban ecology option will visit collaborative stormwater projects along the MKT trail including the 3M wetland, a restoration project on the site of a former waste treatment site. Following the tours, both groups will join for a fun climb demonstration and 5K run/walk at Stephens Lake Park. Complete conference schedule available at http://mocommunitytrees.org/ mcfcannualconference.html



From There to Here- Movement of Insect Pests in Winter

By Sarah Phipps, Missouri Department of Agriculture

The outside is mostly still across the winter landscape. Exceptions include the squirrel who scampers up and across the tree branches, and the winter-resident birds found flittering around bird feeders. No arthropods crawling, flying, swarming, or wriggling of any sort are seen anywhere. Well...unless you count the lady beetle flying around the kitchen, alighting on the cabinet doors, or the garage-dwelling spider residing in the abandoned boot.

Like other animals, insects spend the cold winter months hibernating. Insects take refuge as adults, pupae, larvae, or eggs; staying buried in the soil, nestled in the leaf litter, burrowed within trees, or hunkered down in pretty much any spot that can provide protection from the cold. Some simply overwinter as an egg case attached to a twig or branch, or a myriad of other surfaces that females find suitable for egg laying.

While the insect world seems motionless in the winter landscape, the cold, unfortunately, does not halt the movement of invasive insects. They move unbridled from wooded area to wooded area and household to household; travelling undetected along highway corridors across the state and even across the country. You might ask, in their winter stupor, how are insects able to get around? Invasive insects are remarkable hitchhikers as they move with the items we humans carry with us.

Gypsy moth, a notorious defoliator of oak trees and hundreds of other hosts, is one of these quintessential hitchhikers. Established in the northeastern part of the United States (closest population being Northeast Illinois), gypsy moth are able to travel long distances due to their habit of gluing their egg cases that contain 600-1,000 eggs onto commonly found outdoor objects. The female cannot fly. Instead, she crawls up on lawn furniture, playsets, picnic tables, cars, boat trailers, travel trailers, and any other outdoor item she can locate. As the female moth is laying the eggs, she plucks hairs off her abdomen and mixes it with her eggs creating a light brown colored egg mass that can survive some of the harshest winters. Egg masses have been able to withstand temperatures down to negative 30 degrees Fahrenheit.

During the cold winter months, another hitchhiker that travels far and wide with human assistance are invasive wood boring insects moving in firewood. The insects go unnoticed, as they are moving as eggs or larvae of these pests, which may be hidden on or under the bark or buried deep within the wood.





Gypsy moths can lay their egg masses on any solid object found outdoors- like this lawnmower- which people could move to uninfested areas, accidentally causing great harm.

The most infamous woodborer pest in Missouri at this present time is the Emerald Ash Borer (EAB) which feeds on healthy ash trees. The destructive insect has been confirmed in 42 Missouri counties, as well as the City of St. Louis, and is suspected to be present in several more locations. Other notorious wood borer pests that we are concerned about entering our state are Asian longhorned beetle and walnut twig beetle.

Sadly, with the help of humans, invasive insects can travel hundreds of miles in a single day. Alarmingly, what should take decades of natural expansion for these populations to spread, now easily spreads from region to region overnight. To help avoid the danger these pests pose, people need to help prevent pests from moving into our state by being aware and sharing the knowledge with others.

FOREST MANAGEMENT

While several state and federal agencies reach out to campsites, nurseries, wood workers, and other likely pathways, anyone can help the effort to protect our forests. The random conversation with a new neighbor or a friendly camper you just met may pay dividends for generations. You never know, a casual chat with a person from an infested area about the dangers of unwanted hitchhikers may save our forests.

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For the gypsy moth, all cars, campers, and any other outdoor household articles that could harbor gypsy moth egg masses should be carefully inspected when an outdoor item is moved from a gypsy moth quarantined area in the northeastern United States. If any are found, remove by scraping and dropping into soapy water. It's too late to prevent EAB from getting into our state, but further infestations from other invasive wood-boring insects can be avoided by purchasing local firewood and not moving untreated wood farther than 50 miles from where it was harvested to prevent long distance movement of pests. Please pass the message along!

continued from page 1

However, oak trees experienced significant leaf damage and injury from dicamba treatments (Figure 4). Dicamba also caused greater injury through the duration of the season compared to 2,4-D.

To investigate your trees for dicamba or 2,4-D injury, look for symptoms on the newest growth. Since these herbicides are most often translocated to the newest growth within the plant, they will express injury symptoms at the growing points and meristematic regions of the plant. In order to confirm that your trees are experiencing damage from dicamba or 2,4-D it is important to check all nearby broadleaf plants. Lastly, try to determine the source from which an application of 2,4-D or dicamba may have been made. Keeping detailed records of when injury was noticed, taking photographs of injury symptoms, and allowing a professional to assess the situation are all steps that will help you to understand actions to properly handle the situation.

So what are the implications if you experience drift on your hardwood trees? In most cases, trees will not experience death by driftable fractions of 2,4-D and dicamba alone. However, it is possible that trees will become weakened and will be more susceptible to insect and disease, which can have lethal impacts on trees if not treated in a timely fashion. Long-term and sequential impacts of dicamba and 2,4-D on large established trees are not well known.

For more information about dicamba or 2,4-D injury to hardwood trees and a various other species, please visit the University of Missouri Weed Science website at https://weedscience.missouri.edu/.



Figure 2. 2,4-D injury on Black Walnut tree;



Figure 3. 2,4-D injury on Pin Oak





Figure 4. Dicamba injury on Pin Oak



Cattle and Windbreaks – Protecting the Land, Protecting the Investment

By Pamela Bergstrom, Forester for the Lower Elkhorn Natural Resources District in Norfolk, NE and Online Agroforestry MS student at UMCA.

The beginning of 2018 has been frigid across much of the United States including the Great Plains and adjacent Midwest. Low temperatures have combined with high winds to produce deadly sub-zero wind chill readings. Millions of cattle are scattered across this region. Windbreaks are one excellent method to help protect livestock from extreme winter weather. Windbreaks consist of rows of trees are planted in straight rows around homesteads, cattle yards, and crop ground. During the Dustbowl in the 1930's, President Roosevelt (FDR) envisioned one massive windbreak from Texas Canadian border to prevent soil erosion and put people back to work through the Civilian Conservation Corps and Works Progress Administration.

It is well known that windbreaks improve crop yields (and crop quality) and help prevent wind borne soil erosion. In addition, depending upon their design, they can also provide numerous other benefits including: winter snow dispersal across crop fields to provide moisture to spring crops; road protection (i.e., living snow fences); protection for buildings and reduction in energy costs; enhancement of wildlife habitat; and reduction in odor plume around confined animal feeding operations (i.e., vegetative environmental buffers or VEBs). In addition to the multiple benefits of windbreaks already listed, this article will focus on the positive effects windbreaks have on cattle.

Cattle, especially beef cattle, are a major part of the economy in Nebraska and other Midwest states including Missouri, Iowa, Kansas, Oklahoma, Texas and the Dakotas. In the majority of these states, winters can be long and brutal, putting pressure on livestock health and reproduction, especially bred heifers or cows that calf during the late winter or early spring.

David Ames, retired environmental physiologist at Colorado State University, conducted studies at Kansas State University on cold weather effects on cattle. He developed wind chill indexes for cattle and established their critical temperatures. The value of windbreaks comes partly from understanding wind chill. Wind chill impacts, combined with energy requirements for cattle during cold weather, suggests there is a lot of value in feed cost savings, well-being of the animals, etc., if they are protected from wind when temperature drops below their thermo-neutral zone.



Photo credit: Quam et al. Windbreaks for Livestock Operations.

Livestock response to cold and wind chill. Critical temperatures for beef cattle are determined in part by the condition of the coat. Below the seasonal critical temperatures, livestock must expend more energy to keep warm. For each degree (F) of cold, feed requirements are increased. At 10° F, cows need about 3.5-4 pounds of extra hay daily, or 2-2.5 pounds of grain. When temperatures drop to 10° F below zero, that figure can double, and cows will need 7-8 pounds of extra hay or 4-6 pounds of extra grain each day to maintain internal temperatures against the elements.

			Beef Animal Weight (Ibs)				
		440	660	880	1100	1200	1320
Description	Critical Temp	Percent Increase per Degree of Cold (F)					
Summer Coat or Wet	59	2.3	2.1	2.0	2.0	1.9	1.9
Fall Coat	45	1.5	1.4	1.4	1.3	1.3	1.3
Winter Coat	32	1.2	1.1	1.1	1.0	1.0	1.0
Heavy Winter Coat	18	0.7	0.7	0.7	0.7	0.6	0.6

Table 1. Critical temperatures for beef cattle are determined in part by coat condition. Below the critical temperature, livestock expend more energy in order to keep warm. Adapted from: Quam et al.Windbreaks for Livestock Operations

Researchers at Purdue University found that energy requirements for cows in good condition increased 13% for each 10 degree drop in wind chill temperature below 30° F. A similar study in Iowa on calves and yearlings

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indicated that requirements for feed were 7% greater for those in open lots than for similar animals with shelter. Studies in Montana indicated that during mild winters, beef cattle sheltered by windbreaks gained an average of 34 to 35 pounds more than cattle in an open feedlot. During severe winters, cattle in feedlots protected from the wind, maintained 10.6 more pounds than cattle in unprotected lots.

Other types of livestock also benefit from shelter. Milk production in Holstein and Jersey dairy cattle declines at air temperatures below 35° F. The amount of decline is dependent on animal health, coat condition and feed intake. Under windy conditions further declines in production or increased feed requirements can be expected due to lower wind chill temperatures.

In total, the benefits of windbreaks on livestock include: reduced feed requirements; reduced livestock stress; reduced mortality; increased health; increased profits; and an improved working environment.

Further Reading on Windbreaks

Quam et al. Windbreaks for Livestock Operations. University of Nebraska Cooperative Extension Publication No. EC 94-1766-X. https://nfs.unl.edu/ documents/windbreaklivestock.pdf

USDA National Agroforestry Center. 1996. Outdoor Living Barns, Agroforestry Note #2, Windbreaks #2. https://www.fs.usda.gov/nac/ documents/agroforestrynotes/an02w02.pdf



Table 2. Animal wind chill chart. As temperatures decrease and wind speed increases the danger to animals becomes great. Source: Quam et al. Windbreaks for Livestock Operations.

Currently in Nebraska and throughout large parts of the Midwest, windbreaks are under pressure from use of large equipment and center pivots. When many of the old windbreaks were designed and planted, center pivots had yet to be implemented and farm equipment was much smaller in stature. Today center pivots are common and farm equipment has grown from 6 row planters up to 48 row planters that need more horse power and, critically, more room to maneuver. Providing landowners with scientifically proven advantages of planting windbreaks in the form of protecting livestock during the harsh climates of the winter, will help to encourage and retention and restoration of windbreaks by farmers and ranchers.

MDC workshops in Ozarks teach prescribed fire as a land, wildlife management tool

Landowners should preregister for their desired workshop date and location.

WEST PLAINS, Mo. – Landowners can learn to use prescribed fire as a land management tool at Prescribed Fire Workshops presented by the Missouri Department of Conservation (MDC). The following workshops are planned in January and February throughout the Ozarks:

Dent County: Jan. 27, 9 a.m. to 1 p.m., at the Salem Community Center at the Armory. Call 573-226-3241, ext. 106, to register.

Howell County: Jan. 18, 6 to 8:30 p.m., at the MDC Ozark Regional Office in West Plains. Call 417-256-7161 to register.

Ozark County: Feb. 22, 5:30 to 9 p.m., at the Gainesville Sale Barn. Call 417-683-4816, ext. 3, to register.

Phelps County: Jan. 18, 6 to 9 p.m., at the Eugene Northern Community Center in Rolla. Call 1-800-364-8732, ext. 3, to register.

Pulaski County: Feb. 1, 6 to 9 p.m., at the St. Robert Municipal Center, Suite H, in St. Robert. Call 1-800-364-8732, ext. 3, to register.

Ripley County: Feb. 15, 6 to 9 p.m., at the US Forest Service Office in Doniphan. Call 573-996-7116, ext. 3, to register.

Shannon County: Feb. 22, 6 to 9 p.m., at the MDC Eminence Forestry Office. Call 573-226-3241, ext. 106, to register.

Wright County: Feb. 13, 6 to 9 p.m., at the Ann Short Turner Community Center in Mansfield. Call 417-967-2028, ext. 3, to register.

10 FOREST INDUSTRY

The Bid Box

Hank Stelzer, MU Extension - School of Natural Resources

The installment of The Bid Box serves as an excellent example why you need a professional forester when it comes to selling your trees, especially if those trees are walnuts!

Randolph County, Missouri

- 194 marked walnut trees
- Estimated volume: 41,700 bd. ft. (Doyle Scale)
- Very good quality; some veneer and three sides clear. Forester estimated the value of one tree to be in the \$6-7,000 range.
- Forester valued the sale at anywhere from \$60,000 to \$80,000 market value, depending on the prices he put in for different products. He advised landowners to not be surprised if we got a wide range in bids, and some much higher than his estimated range.
- Seven bids received
 - o \$151,000
 - o \$104,500
 - o \$95,000
 - o \$80,000
 - o Two in the \$60,000 \$65,000 range
 - o \$59,500

The Bid Box

The forester knew the high-bidder, but had never worked with him before. The buyer was not from the area. The forester contacted foresters in other states who had worked with the buyer. Satisfied with their responses, he set up a meeting between the seller and buyer to sign contracts and take care of payment.

Two days before the meeting, buyer emailed the forester informing him that he looked at the trees for himself (the buyer had sent someone else in the company to inspect them the first time). The buyer wanted to "exchange" 37 of the marked trees for 22 "buyer's choice" trees, and keep the money the same.

The forester said no, and the contract was going to be for the marked trees. If he wanted to buy 22 more trees, the forester would be happy to walk the woods, look at them, and advise the landowners if they should be sold or left to grow for the next cut. The buyer withdrew his bid. The forester removed the buyer from his list and notified other foresters. That buyer will find some difficulty buying forester-assisted sales in Missouri again.

The second high bidder was local, someone whom the forester had worked with before and does fantastic work in the woods. He was still interested and a contract was signed for his \$104,000 bid.

If you are thinking about selling your timber, contact your professional forester now! Not only will they help you get the highest price for the trees in your woodlots that need to be harvested, but they can help ensure future harvests are profitable, too! To help you become familiar with some of the aspects of selling timber, check out the following MU Guides:

G5051 – Selling Timber: What the Landowner Needs to Know G5057 – Basic Elements of a Timber Sale Contract G5056 – Managing Your Timber Sale Tax G5055 – Determining Timber Cost Basis

These guides will help you better understand the ins and outs of marketing your timber and help you help your professional forester!

For more information and a Missouri Managed Woods application, call 877-564-7483, or visit: https:// mdc.mo.gov/ property/propertyassistance/missourimanaged-woods

AGROFORESTRY Species Spotlight: Kentucky Coffee Tree

Hank Stelzer, MU Extension – School of Natural Resources

Kentucky coffeetree, *Gymnocladus dioicus*, occurs from Southern Ontario, Canada and in the United States from Kentucky (where it was first encountered by Europeans) and western Pennsylvania in the east, to Kansas, eastern Nebraska, and southeastern South Dakota in the west, to southern Wisconsin and Michigan in the north, and to northern Louisiana in the south.

However, the tree is considered rare in the woods. This tree usually occurs as widely dispersed individuals or small colonial groups with interconnected root systems. This tree is found in floodplains and river valleys but is also sometimes seen on rocky hillsides and limestone woods. In some parts of its range, this tree may be used as an indicator of the presence of limestone or of calcareous soils. The tree is typically fairly short-lived, healthy trees living from 100 to 150 years.



Leaves: Alternate, bi-pinnately compound, the largest of any native species, 1'-3' long, 18"-24" broad. Leaflets ovate, 2"-2 ½" long, wedge-shaped or irregularly rounded at base, with wavy margin, acute apex. When full grown are dark yellow green above, pale green beneath. In autumn turn a bright clear yellow. The tree sheds its leaves early during the fall and appears bare for up to 6 months. The naked appearance of the tree is reflected through the species Latin genus name, which means "naked branch".

Flowers: Appear in June. Species is dioecious; male and female flowers on separate trees.

Fruit: Legume, 6"-10" long, 1½"-2" wide, somewhat curved, with thickened margins, dark reddish brown with slight glaucous bloom. Seeds six to nine, surrounded by a thick layer of dark, sweet pulp. Pods and seeds are considered poisonous and are reputed to contain the alkaloid cytisine.

Twigs: Stout, and blunt. Pith is large and salmon-pink in color. Winter buds are minute, depressed in downy cavities of the stem, two in the axil of each leaf.

Bark: Tan or dark gray, deeply fissured, surface scaly, often with prominent narrow ridges.

Wood: Light brown; heavy, strong, coarse-grained; durable in contact with the ground, takes a fine polish. Specific gravity, 0.6934; weight of cubic foot, 43.21 lb. The wood is used both by c cabinetmakers and carpenters. It has very little sapwood.

Food: The beans of the tree were eaten, after roasting, by the Meskwaki (Fox), Ho-Chunk (Winnebago) and Pawnee Native American cultures. The Meskwaki also drank the roasted ground seeds in a hot beverage similar to coffee. The common name "coffeetree" derives from this latter use of the roasted seeds, which was imitated by settlers because it seemed a substitute for coffee, especially in times of poverty, similar to chicory. Roasting is critical to break down the poisonous alkyloid, cytisine.

Good urban tree. Kentucky coffeetree is a moderately fast-growing tree, and male trees are often grown in parks and along city streets for ornamental purposes. The species is used as a street tree as far north as Montréal Québec. It resists both harsh winters and de-icing salts.

Kentucky State Tree... for a while. From 1976 to 1994 the Kentucky coffeetree was the state tree of Kentucky, until the tulip-poplar was returned to that designation.



Gymnocladus dioicus leaves



Gymnocladus dioicus twig



Gymnocladus dioicus fruit (above) and bark (below)



Images courtesy of www.forestryimages.org. Paul Wray, Iowa State University, photographer.



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green horizons

The Center for Agroforestry at the University of Missouri 203 Anheuser-Busch Natural Resources Bldg. Columbia, MO 65211

Calendar of Events

Agroforestry Symposium: Soil Health in Diverse Cropping Systems

January 25th, 2018 | 8:30am - 6:00pm | Bond Life Science Center, MU Campus, Columbia, MO Invited Speakers include: Dr. Wayne Honeycutt, Soil Health Institute; Dr. Amelie Gaudin, University of California Davis; Sara Parker Pauley, Director, Missouri Department of Conservation; Dr. Nick Goeser, Soil Health Partnership

Program details and live streaming option at http://centerforagroforestry.org/events/symposia.php

Missouri Natural Resources Conference

January 31st - February 2nd, 2018 | Tan-Tar-A Resort, Osage County Beach, MO Registration and program details at http://www.mnrc.org/

Seminar: Livestock Performance in Silvopasture Systems

February 9, 2018 | *9:00am-10:00am* | *Rm210 ABNR Bldg. MU Campus, Columbia, MO* Dr. Gabriel Pent, Ruminant Livestock Systems Specialist, Virginia Tech

National Farmers Union 116th Anniversary Convention

March 3rd - 6th, 2018 | The Westin Kansas City at Crown Center, Kansas City, NFU's 116th Anniversary More information at https://nfu.org/convention/

Native by Design: Woody Plants and Pollinators

March 16th, 2018 7:30am - 12:30pm | Lewis and Clark Community College, Godfrey, IL This native landscaping workshop at the Lewis and Clark Community College in Godfrey, IL will provide information to home gardeners; landowners; landscape, landcare, and wildlife professionals; stormwater engineers; and other related professionals about the relationships between woody plants and pollinators, songbirds, and other important wildlife.

More information at https://www.moprairie.org/

Woodland Workshop: "Working for Woods & Wildlife!"

March 24th, 2018 | *Troy R-III 9th Grade Center, Moscow Mills, MO* Hosted by the Lincoln County Soil & Water Conservation Districts; intended for woodland landowners in Lincoln, Pike, Montgomery, and Warren Counties. Cost of registration is \$5 per person Register by calling Katie Owens at 636-528-4877 Ext.3

Our Farms, Our Future Conference: The Next 30 Years of Sustainable Agriculture

April 3rd - 5th, 2018 | Hyatt Regency Hotel in Downtown St.Louis, MO This national event will bring together our diverse agricultural community: farmers and ranchers, agricultural professionals, agribusiness stakeholders, students, researchers, scientists, agency representatives, and nonprofit leaders. Every decade, SARE hosts a conference to look at the progress of sustainability in agriculture, and to understand our trajectory for the future. More information at https://www.ofofsare.org

