

green horizons

Growing tomorrow's future today.

September 2015

A newsletter from the Center for Agroforestry in
conjunction with the Forest and Woodland Association of Missouri

Volume 19 • Number 3
Mike Gold, Gene Garrett and Taylor Wanbaugh
editors

The Chickadee's Guide to Gardening

In Your Garden, Choose Plants That Help the Environment

By DOUGLAS W. TALLAMY | *New York Times*
MARCH 11, 2015

OXFORD, Pa. — I GREW up thinking little of plants. I was interested in snakes and turtles, then insects and, eventually, birds. Now I like plants. But I still like the life they create even more.

Plants are as close to biological miracles as a scientist could dare admit. After all, they allow us, and nearly every other species, to eat sunlight, by creating the nourishment that drives food webs on this planet. As if that weren't enough, plants also produce oxygen, build topsoil and hold it in place, prevent floods, sequester carbon dioxide, buffer extreme weather and clean our water. Considering all this, you might think we gardeners would value plants for what they do. Instead, we value them for what they look like. When we design our home landscapes, too many of us choose beautiful plants from all over the world, without considering their ability to support life within our local ecosystems.

Last summer I did a simple experiment at home to measure just how different the plants we use for landscaping can be in supporting local animals. I compared a young white oak in my yard with one of the Bradford pears in my neighbor's yard. Both trees are the same size, but Bradford pears are ornamentals from Asia, while white oaks are native to eastern North America. I walked around each tree and counted the caterpillars on their leaves at head height. I found 410 caterpillars on the white oak (comprising 19

different species), and only one caterpillar (an inchworm) on the Bradford pear.

Was this a fluke? Hardly. The next day I repeated my survey on a different white oak and Bradford pear. This time I found 233 caterpillars on the white oak (comprising 15 species) and, again, only one on the Bradford pear. Why such huge differences? It's simple: Plants don't want to be eaten, so they have loaded their tissues with nasty chemicals that would kill most insects if eaten. Insects do eat plants, though, and they achieve this by adapting to the chemical defenses of just one or two plant lineages. So some have evolved to eat oak trees without dying, while others have specialized in native cherries or ashes and so on.

But local insects have only just met Bradford pears, in an evolutionary sense, and have not had the time — millennia — required to adapt to their chemical defenses. And so Bradford pears stand virtually untouched in my neighbor's yard.

In the past, we thought this was a good thing. After all, Asian ornamentals were planted to look pretty, and we certainly didn't want insects eating them. We were happy with our perfect pears, burning bushes, Japanese barberries, porcelain berries, golden rain trees, crape myrtles, privets, bush honeysuckles and all the other foreign ornamentals. But there are serious ecological consequences to such choices, and another exercise you can do at home makes them clear. This spring, if you live in North America, put up a chickadee nest box in your yard. If you are lucky, a pair of chickadees will move in and raise a family. While they are feeding their young, watch what the chickadees bring to the nest: mostly caterpillars. Both parents take turns feeding the chicks, enabling them to bring a caterpillar to the nest once every three minutes. And they do this from 6 a.m. until 8 p.m. for each of the 16 to 18 days it takes the chicks to fledge. That's a total of 350 to 570 caterpillars

Continues on page 10 >

In this issue

Native Plants	1, 2, 10
Forest Management	3, 8, 10
Agroforestry	4, 5, 6
Forest Industry	9

What's All the Buzz About Native Plants?

BY KIM YOUNG | *Forrest Keeling Nursery*

WAYNE LOVELACE | *Forrest Keeling Nursery*

The White House recently released a "National Strategy to Promote the Health of Honeybees and Other Pollinators". This initiative calls for the installation of one million 'pollinator' gardens and the expanded use of native plants in the landscapes of federal properties. Consumers are alarmed with the use of certain pesticides, which may be linked to a decline of the honeybee population and other pollinators. The loss of native habitat to support critical pollinators and other wildlife is also a growing concern.

The impact of the introduction of exotic species to our landscapes has never been more evident or relevant. We are painfully cognizant of the threat to our natural ecosystems from the uncontrolled spread of invasive plants. The challenge to eradicate species such as bush honeysuckle, callery pear, kudzu, lespedeza,

multi flora rose, and the list goes on, is difficult and costly. At some point these exotic plant introductions seemed like a good idea, offering solutions for erosion control and sources of abundant wildlife food. These 'solutions' now threaten the health and diversity of our native ecosystems. Consumers desire local and healthy food choices. Tolerance of higher costs associated with safe and thoughtful food production is evident from the expanded shelf space dedicated to organically grown produce. There is a growing trend toward the inclusion of edible plants in our landscapes. Native fruits and nuts such as pawpaw, chokeberry, elderberry, pecans and walnuts provide a multitude of health benefits and are creating local niche market opportunities.

Recently, we have experienced dramatic climate extremes such as the severe drought during the summer of 2012. When the dust settled, we looked around and noted that what had survived were our native species. Native genotypes have evolved to withstand the extreme fluctuations we can experience in weather patterns. A real and growing concern over the availability of water has us rethinking what we are planting in our lawns and landscapes, shifting us to use drought tolerant and low maintenance native species.

Most major cities now require the use of best management practices and green solutions to reduce and control storm water. Developers are required to build systems designed to keep storm water from leaving the property. Homeowners are encouraged to install rain gardens and native plants to filter nitrates and other pollutants from entering our water sources. Farmers are incentivized to install native plant buffers to control stream bank erosion and mitigate the introduction of antibiotics and other agricultural by-products

into our riparian systems.

Additional motivation for using native plants comes from the trend to build using sustainable construction, materials and practices. Green building programs such as LEED certification, encourage developers to employ sustainable landscape designs, including the use of native plants. Corporations are installing native landscapes on



their campuses and planting native trees to offset carbon footprints, demonstrating their commitment to protecting the environment.

In 1934, Aldo Leopold said, "Conservation will ultimately boil down to rewarding the private landowner who conserves the public interest". Today, we see his visionary prophecy coming to light with the implementation of market-based and voluntary programs developed to compensate landowners for preserving our natural ecosystem services. Landowners can prosper from providing wetlands, wildlife habitat, pollination services, bioremediation, and improving water and air quality, through the use of native plants.

The use of native plants has achieved a foot-hold in today's landscape industry. Native plants that once lacked prestige are now desirable and in demand. When used with thoughtful design, native plants provide our landscapes with unrivaled beauty. More importantly they are the life support of our critical native ecosystems.

To learn more about native plants and their uses in farm and home landscapes or to find where to purchase native plants visit www.grownative.com.

FOREST MANAGEMENT

Manage What You Have First

BY EUGENE L. BRUNK

I've talked a lot about planting trees in my professional life, and it's usually a good thing. In fact, I've found it is much easier to get a person to plant a tree than it is to convince them that trees will need management along the way. Harder still, has been trying to convince folks that they can get the most "bang for their buck or time" by taking care of trees they already have, regardless of the source.

Taking care of what we already have growing is not a glamorous part of forestry, but it is probably the most productive, be it out in the woods, or out on the town. Photos of kids planting trees makes for better news copy than photos of work crews caring for trees. When I was a young forester, just starting to work with private landowners, I was sent to inspect a proposed Soil Bank project that was to be done by a lawyer who had bought an old farm and was going to "improve" it by planting 30,000 walnut seedlings in a 30-acre, fescue grass field. I knew this was too many walnut seedlings to plant per acre, but the program parameters called for 1,000 seedlings per acre.

When I looked at the proposed planting, I also looked at the rest of the farm, and was astounded to discover thousands of naturally-established walnut trees ranging in size from seedling to saplings to even small poles and a few large trees. The potential for immediate improvement was great, and I tried my best to encourage the lawyer to put his efforts into the existing trees, but to no avail. He insisted on going ahead with the planting. I did everything I could to

disqualify his proposal, but all the Soil Bank requirements were in place, so I had to approve the project. After he finished, I inspected the job, and they had done an excellent job of planting. I still encouraged him to manage what he had out there and he said he would (eventually) but really needed to make sure this planting "worked." I later found out he needed the government payment to pay off a mortgage payment on the property.

About 15 years later, I ran across this lawyer at a Walnut Council field tour, and he made a point of telling me that I had been right. The planting had failed because there was very little follow-up on weed or fescue control or anything else. The Soil Bank Program didn't have a very long time period for maintaining a tree planting, and no re-inspection requirements after the first year or two. He said he had started managing the existing regeneration within the past 5 years, and lamented losing ten years of accelerated growth, and apologized for not listening to me. His pursuit of a government payment got in the way of making a proper long-term management decision that would have paid off much better than a failed plantation.

What does this story have to do with urban tree care? I believe it can be used as an analogy to things we see happening in urban and suburban settings throughout the state. How often do we see trees left unpruned because it's easy to put off, with a promise to "get to it later?" Or, how about the homeowners association that wants to clear out all

that "brush" (natural regeneration) in the common part of the subdivision so they can plant some really nice trees to make it look more "natural?" The same thing may be true of the individual homeowner who sees some funny looking leaf on a woody plant right in the middle of a place where they want to establish their favorite redbud tree. So, he/she pulls out the naturally-occurring redbud seedling and replaces it with a potted redbud seedling (seed source unknown) from the local "parking lot lawn and garden center", then has a difficult time nurturing it through the first year --- just to get it to live.

There are probably many more examples out there concerning the value of managing what you already have growing; many of which are probably better than those I've mentioned. Being aware of the opportunities to manage existing vegetation, and following through with required treatments, can lead to a home site that is comfortable and appealing, an urban forest that exemplifies community pride and appeal, or even a rural forest that is as productive as it can be for recreation, watershed protection, wood production, and wildlife habitat enhancement.

Good stewardship of any asset requires that you first take care of the basis handed you before trying to add to those assets. Trees are no exception.

OSAGE ORANGE: ‘One Tough Tree’

DUSTY WALTER | *University of Missouri Ag. Experiment Station*
GENE GARRETT | *University of Missouri, Center for Agroforestry*

The University of Missouri, Center for Agroforestry prides itself in developing and introducing specialty crops for the family farm. It has conducted successful research and outreach on species like Chinese chestnut, black walnut as an orchard species, long-needled pine species for producing “pine straw”, a valuable landscaping mulch, and even gourmet mushrooms. But occasionally, the Center takes on a real challenging species. While some refer to it as one of “Nature’s Wonders”, most landowners see Osage orange as a thorny, very undesirable tree with few redeeming qualities! In spite of this, Osage is actually a very versatile tree. Its utility and potential was realized early by settlers who first came upon it as they made their way westward.

The many names of Osage orange reflect its diversity of uses. The scientific name is *Maclura pomifera*. However, early in its history the term *bois d’arc* was used to describe the tree which Native Americans, and specifically members of the Osage Nation, prized for wood to make bows and clubs. This French term has also been stated as “bodark” or “bodarc”. “Hedge” is another name often used. This highlights not only its widespread use in the 1930’s as the tree of choice for windbreak plantings across the Great Plains states, but also the fact that early settlers would use rows of the tree as a “living fence”, capitalizing on the species thorniness and dense branching habit to contain their livestock. And, because it produces a softball-sized green fruit, some will know the tree by the name “hedge apple”. So, does the word “orange”, in Osage orange, refer to similarities between its fruit and an orange? Possibly, but it may also reflect the fact that the wood is a golden yellow color which may contain unique chemicals of unknown value for wood treatment, pest control, or even medicinal purposes?



While the native range of Osage orange is relatively small, it will grow almost anywhere. Occurring natively in parts of Texas, Oklahoma and Arkansas, it was nonetheless widely planted as a part of the Great Plains Shelterbelt initiative, which was designed to control wind erosion and prevent soil loss. It can now be found growing from Canada to as far south as Florida and Texas and even on the west coast.

While not a typical timber species, Osage does produce multiple products of value. One such product is the hedge post. A fence built with hedge posts will last several generations. Typically, hedge posts can be purchased that range in price from \$8 - \$25.00/each, depending on size. Historic documentation indicates that fence posts could be harvested every 15 years. Depending on the site (soil and moisture), fence posts most likely can be harvested every 15-40 years. It is also valued as a firewood. Osage has the highest BTU (British Thermal Unit - a measure of heat produced) output of any North American tree. The propensity of Osage to sprout back after cutting makes it a very renewable farm resource.

Osage, or hedge, also may have other uses. Though science has failed to validate the claims, hedge balls are nonetheless still used by many households to repel insects and spiders. Although the hedge balls are of minimal wildlife value, the tree itself is excellent escape cover from weather extremes. Many a successful pheasant or quail hunt has taken place along hedge rows.

Because of its site adaptability and value of products, Osage offers opportunities for Agroforestry plantings—especially if a method can be developed to grow straight stems. When open-grown, the tree tends to branch heavily and develop poor/crooked

‘One Tough Tree’

Continued from page 4

form. At the University of Missouri, trials are underway to identify the value of planting Osage at tight spacings, (e.g., 6 X 6 feet) to enhance straightness. If straight stems can be grown, agroforestry plantings with Osage, such as windbreaks and forested riparian buffers, can create effective conservation practices while yielding valuable commercial products.

Perhaps Osage orange, hedge apple, bodark, bois d’arc or whatever name you wish to call it, really is one of “Nature’s Wonders”! Maybe it even holds promises that have not yet been realized by the scientific world and can only be realized through extensive chemical analyses and clinical trials. Perhaps such tests might

even be inadequate to reveal the secrets of this plants physiology. Who of you out there know of a tree that can be purchased from the Department of Conservation Nursery, loosely re-wrapped in its paper packaging, cast into the edge of a woods, endure the extreme weather conditions of a summer and winter and yet be viable the following spring? Not only viable, but be capable of being planted, surviving and growing vigorously! This is not fiction, it happened!! So in addition to all the other names that have been bestowed upon this species, the authors would like to add one more, it is “one tough tree”!!!

By The Numbers – The National Woodland Owner Survey in Missouri

By STEVE WESTIN | *Missouri Department of Conservation*

The voluntary National Woodland Owner Survey is conducted by the U.S. Forest Service on a periodic basis to assess the characteristics and attitudes of the owners of America’s private forest land. The last two surveys were completed in 2006 and 2013. The results of the survey help the Missouri Department of Conservation and other agencies and organizations understand and better assist Missouri’s private forest landowners.

Selected results from the Survey will be periodically highlighted in this, and future, issues of Green Horizons. Due to differences in the number of surveys sent to Missouri landowners in the different years, some results can only be reported in a general way, while others can be more specific.

- 83% of Missouri’s 15.4 million acres of forested land is privately owned. 92% (11.8 million acres) of that private ownership belongs to individuals and families. The remaining million acres of private land is owned by companies and other miscellaneous owners such as conservation organizations, clubs, etc.
- There are about 438,000 Missourians who own at least one acre of wooded land. This number is up significantly from the 339,000 owners estimated by the 2006 survey. Of the 438,000 forest owners estimated by the 2013 survey, 52% (about 226,000 people) own less than 10 acres of forest each. This is an increase from 43% (about 145,000 owners) estimated by the 2006 survey. While making up over half of Missouri forest owners this group only owns about 6.6% of the family-owned forest area in the state, up from 4.6% ownership in 2006.

The 2013 Survey shows that of the 212,000 Missouri landowners who own 10+ acres of forest:

- 40% own 10 – 19 acres
- 28% own 20 – 49 acres
- 18% own 50 – 99 acres
- 14% own 100+ acres, which totals 51% of the family forest area in Missouri.

In 2013, of Missouri landowners who own 10+ acres of forest:

- 10% are less than 45 years old
- 19% are 45 – 54 years old
- 32% are 55 – 64 years old
- 39% are 65 or older

“Creating a Woodland Silvopasture Using Small Ruminants”

By CHARLOTTE CLIFFORD-RATHERT |
State Extension Specialist-Small Ruminants
Lincoln University, Jefferson City, Missouri

The practice of silvopasture can increase the versatility of land and increase farm incomes. It is of interest to many landowners and particularly relevant to the limited resource farmer. Silvopasture is defined as the practice of integrating timber production, forage management, and livestock production. The result: landowners gain potential annual income from trees, forages and livestock on acreage likely not in production. Additionally, the amount of fertilizers, herbicides, and feed are reduced. The practice of silvopasture also provides benefits such as reduced moisture loss in comparison to an open pasture, shade and protection for livestock, and soil fertility improvement for tree and forage growth. While most silvopastures are designed with cattle in mind, both goats and sheep can be used. Goats are considered beneficial “herbicides” as they prefer to browse from the top of a plant and work down. This makes goats ideal for controlling unwanted vegetation that would compete with trees and other desirable vegetation for nutrients and water. Using livestock to control specific vegetation is also termed “targeted grazing”.

A plant inventory conducted by a professional botanist can be helpful in the early planning stages of establishing silvopasture. Many of the woody plants that are native to Missouri are also sources for tannins which can serve as an important factor in the natural control of intestinal parasites of small ruminants.

A Forest Management Plan or Timber Stand Improvement Plan can be helpful in determining the trees to be retained and those to be removed. The Missouri Department of Conservation and the Missouri Consulting Foresters Association can identify professional foresters to conduct surveys, create plans and assist landowners in implementing their plans.

When designing a silvopasture for any type of livestock, one should consider the location of trees that can serve as a shelter from the weather. The placement of shaded areas and windbreaks can be included in the design. Small ruminants, in particular, need shelter from wind, rain, and snow. For instance, a grove of cedar trees can function as a shelter and windbreak and should be retained in a small ruminant, silvopasture design. Goats will eat cedar for the tannin content during certain times of the year, so this also must be taken into consideration. Providing or leaving other tannin-containing plants could reduce the stress on the cedar trees. If the forage base is weeds and grass rather than woody material, sheep would perform better than goats. Sheep tend to prefer weeds and grass, while goats prefer woody material.

Fencing is another important aspect to be considered and will be an investment. Five-to-seven strand high tensile electric fence works well as an exterior fence to contain goats and sheep while keeping predators at bay. Barbed-wire fence is workable if it is 5-7 strands or installed with 2-3 offset electric polywire strands in-between the barbed wire. Temporary fencing

works well for interior fences to establish rotational grazing paddocks and to protect young trees. Access to water is a priority when establishing any silvopasture. The NRCS has publications available that show a producer how to assemble different types of fencing as well as waterers.

Stocking rate for goats and sheep in a silvopasture is dependent on whether the goal is vegetation management as a forage or for elimination. To manage vegetation for sustainable browsing, start browsing late spring, rest vegetation for at least 6-8 weeks and do not defoliate in the fall. The area should be divided into paddocks of no more than 1-2 acres. The number of goats or sheep per acre is determined by the amount of vegetation present and the animals are rotated into the next paddock after 75-80% of the vegetation is consumed. Vegetation requires at least 30-60 days for foliage to return to browsing status under ideal conditions. Under drought conditions, more time is required for the vegetation to return to an amount that can sustain the animals, and in extreme drought conditions, the vegetation may not recover fully. Not all paddocks will contain the same amount or quality of vegetation, so the time of browsing and recovery will vary. To control parasites in small ruminants, it is recommended that vegetation be rested a minimum of 30-60 days and allowed to recover to a height that parasite larva will not be consumed by the goats or sheep. If the goal is to eliminate vegetation, a greater number of animals may be required and browsing will start

Continues on page 7 >



'Woodland Silvopasture'

Continued from page 6

in early spring, rotation rest period shortened to 6 weeks, and vegetation defoliated through the fall. Each successive year, the returning vegetation will decrease and the stocking rate must be adjusted. It may take 3-4 years to eliminate vegetation using goats or sheep. Word of advice: have an alternative plan to feed the animals in case of drought! In winter, most foliage will be dormant or missing, goats and sheep will need supplemental feed and hay. This is a critical time since the females are usually pregnant during the winter months.

Today's economics forces us to look for alternative ways to diversify agricultural production and be more resourceful. The primary constraint to adopting silvopasture practices is a

lack of familiarity. By integrating goats into forested areas to transform and integrate a developing silvopasture onto managed farms, environmental and economic benefits can be realized. This is especially important for the limited resource farmer.

Helpful Resources:

NRCS: Missouri Electric Fencing for Serious Graziers

NRCS: Missouri Watering Systems for Serious Graziers

MU Center for Agroforestry:
Handbook for Agroforestry Planning & Design

USDA- National Agroforestry Center: Silvopasture: Establishment & management principle for pine forests.

The Bid Box By HANK STELZER | MU Forestry Extension

PIKE COUNTY, MISSOURI

25 acres

281 mixed hardwoods

Doyle tree scale used, 42,720 bd. ft.

35,380 bd. ft. white oak

1,880 bd. ft. red oak

960 bd. ft. black oak

1,980 bd. ft. hickory

2,520 bd. ft. other mixed
hardwood species

Forester valued sale: \$15,500

2 bids: \$11,500 and \$19,500

Landowner took high bid

Return: \$780/acre

Another issue of Green Horizons, another installment of The Bid Box! This sale shows you do not have to own a lot of timber to generate significant revenue.

If you are thinking about selling your timber, contact your professional forester now! Fall is an excellent time to prepare your timber tract for sale. And if you have never sold timber before, 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

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

Planning a Successful Timber Harvest

By HANK STELZER | MU Forestry Extension

A successful timber harvest lies in working with a professional forester and your logger before the first tree is cut. The following abbreviation of a ten-step approach developed by Lynn Barnickol (Missouri Consulting Foresters Association)

and Jason Jensen (Missouri Department of Conservation) provides an excellent framework for the planning process. Emphasis on each step may vary with site and location in Missouri.

1. Safety first. Safety must remain a constant consideration throughout the harvest planning process. Every decision made will have safety implications.

2. Recon. Using aerial, topographic and soil maps, your forester will conduct on-the-ground reconnaissance of the area to be logged. Noted are: the slope, aspect, soils, timber stands to be harvested, streams, access to the timber, boundaries, and old logging roads.

3. Identify streamside management zones (SMZ's). SMZ width is site specific and is determined by factors such as stream classification, soil type, and percent slope. An SMZ should be a minimum of 50 feet wide or as determined in Missouri Watershed Protection Practice.

4. Locate log decks. Location of the log decks depends on road building cost, skidding cost, timber volumes, skidder payload, and environmental impact. The size of the log deck will depend upon the type of logging

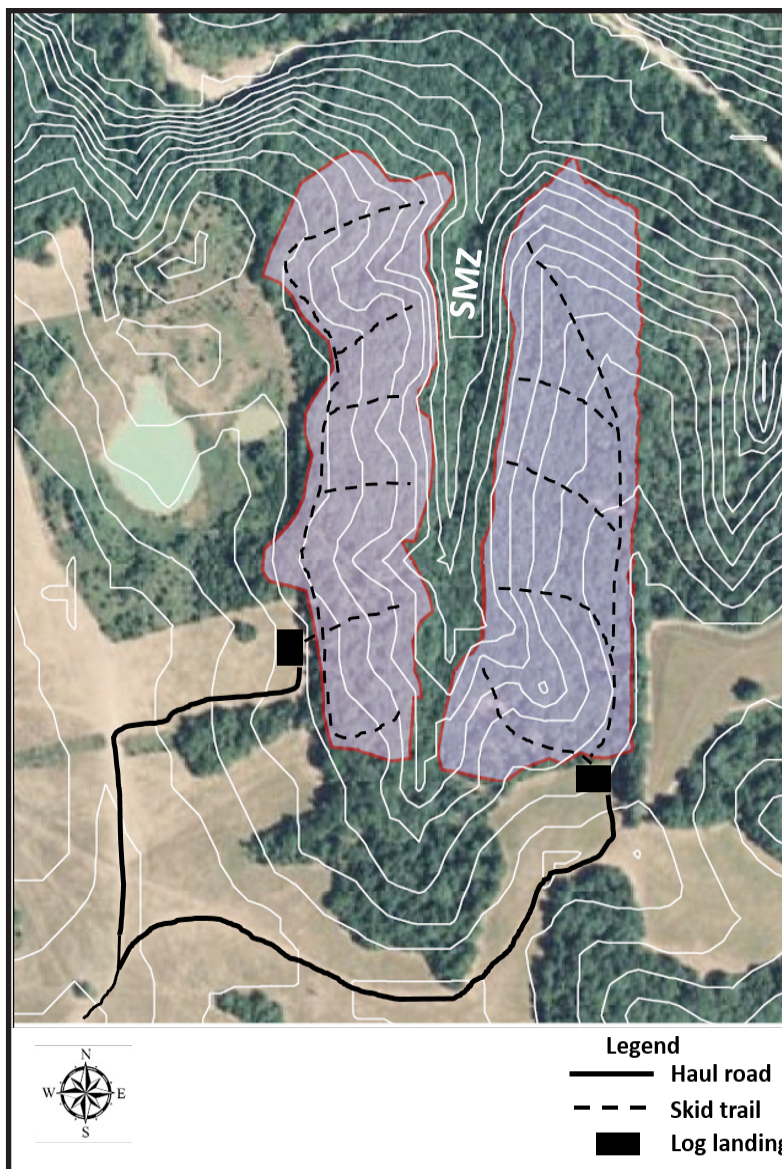
have stable soils that do not easily rut.

5. Locate logging road entrances. In some areas, highway entrances must be approved by the resident highway engineer. Generally, the law requires 300 feet of visibility in either direction when pulling onto the

highway. Truck turning radius, angle of approach, and direction of travel loaded and empty must be considered. Entrances should always be located on well-drained, stable soils and road rock may be needed to keep mud from being transferred onto the highway.

6. Locate logging roads. New roads should be located on a topo map prior to locating on the ground. Your forester will take the map to the woods and flag-in the proposed road. Road grade should be kept at 8% or less and the roadbed placed on well-drained, stable soils. As a general rule, haul roads should be 1-½ times as wide as the equipment utilizing the road, allowing the truck driver to address any ruts or soft places in the road. Harvesting trees adjacent to the road will improve drying and snow melt in

the winter. Most primary haul roads are county roads. Secondary haul roads connect the harvest site to the county road or highway. Typically,



equipment to be used, topographic constraints, landing layout, amount of timber skidded to the deck, and environmental impact. Log decks should be kept as small as feasible, be slightly sloped, facilitate drainage, and

Continues on page 10 >

FOREST INDUSTRY

Know the Facts Before Buying, or Selling, Firewood

By BOB SCHULTHEIS | *Natural Resource Engineering Specialist, Webster County Extension Center*

Many people who buy cordwood for their home wood stoves admit they don't understand the transfer process. Some sellers talk in terms of a "rick," a "rank" or a "pickup load."

Others mention a "face cord" and still others talk in terms of a cord or fractions of a cord. Sometimes the definitions vary from seller to seller and from locality to locality.

"We would like to think that most sellers are honest and the transaction is fair. However, this is no way to run a business," said Bob Schultheis, natural resource engineering specialist with University of Missouri Extension.

Schultheis shares here the most common questions he receives about buying and selling firewood, along with his answers to the questions.

Q: Homeowners with wood stoves are stocking up on firewood for their winter heat supply. I understand there is a state law governing how firewood is bought and sold?

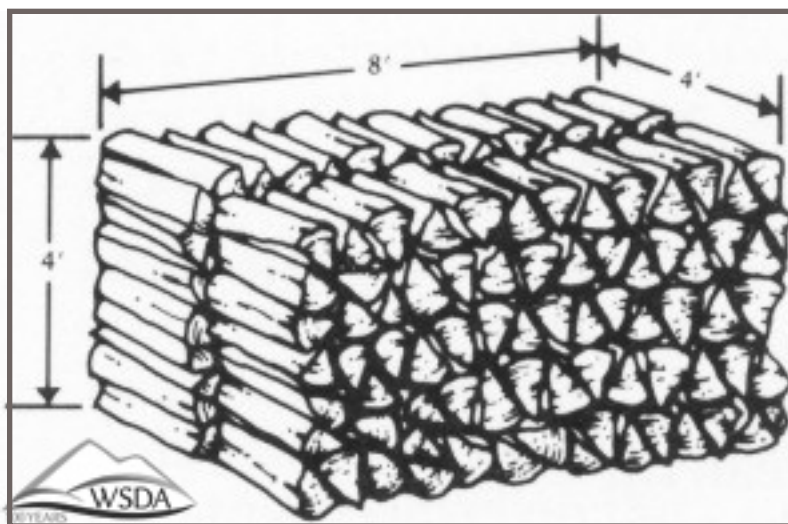
A: Yes, by state law, firewood must be sold by the cord or fraction of a cord, and it must be accompanied by a bill of sale in accordance with requirements of the Missouri Department of Agriculture's Division of Weights and Measures. Rick, rank, face cord, truckload, and pile are not legal units of measure for sale of firewood.

Q: How much is a cord of wood?

A: A cord of wood measures four feet high, four feet wide and eight feet long, totaling 128 cubic feet. Any combination of these measurements is fine as long as they total 128 cubic feet when the wood is stacked in a compact manner.

Q: What's the easiest way to measure a stack of wood?

A: A simple way is to measure the length, width and average height (all in inches) of the compactly-stacked pile of wood. Multiply these three figures together and divide the result by 220,000. The answer is the number of cords. Multiply this number by the dollar cost per cord to get the price the buyer should pay.



Q: Any other tips on getting a fair deal when buying firewood?

A: First, don't pay for the wood until it has been stacked and measured by both the buyer and seller. Second, get a receipt with the seller's name, address, phone number and vehicle license number, along with the price, amount and kind of wood purchased. Third,

if a problem with a seller cannot be resolved, contact the Missouri Department of Agriculture's Division of Weights and Measures at 573-751-5639.

Q: Where can I get more information on buying and selling cordwood?

A: Contact the nearest University of Missouri Extension Center and ask for MU Guides G5452 and G5450, which give details about buying and selling cordwood, and about the burning characteristics and heat content of various woods. These guides are available free online at [HYPERLINK "http://extension.missouri.edu/publications"](http://extension.missouri.edu/publications) <http://extension.missouri.edu/publications>. For more information, contact Schultheis at the Webster County MU Extension Center at 417-859-2044, or by email at ["mailto:schultheisr@missouri.edu"](mailto:schultheisr@missouri.edu) schultheisr@missouri.edu.

‘Timber Harvest’

Continued from page 8

secondary roads aren’t graveled except for possible soft spots. Drainage can usually be handled through a few well-placed water turn-outs or broad-based dips. Your forester will consider cost, volume of timber to be hauled over the roads, time of year that the roads will be used, type of trucks using the roads, length of road to be built, available road construction equipment, the need for rock surfacing, time it will take to construct the roads, and how the road will be retired when harvesting is completed.

7. Locate stream crossings. Stream crossings can be expensive, hard on equipment, and a source of environmental and water quality problems. If it is determined that a stream crossing is necessary, your forester will choose a location that will minimize the chance of stream sedimentation resulting from logging or hauling operations. The common types of stream crossings, from least to most expensive, are a ford, a culvert with dirt fill, a “low-water” bridge, and an elevated timber bridge. The “best” choice depends upon the cost, stream characteristics, amount of use anticipated, load bearing requirements, area of forestland drained by the stream, previous “high-water” mark, time of year the structure will be used, and environmental impact.

8. Locate main skid trails. Properly located skid trails will minimize damage to the residual stand. Loggers can utilize undesirable trees as “bumpers” to prevent damage to higher quality crop trees. Main skid trails will also be located away from SMZ’s or other sensitive areas and placed so they can be drained with water bars when harvesting is completed. A general rule of thumb is to keep skidding distance less than ¼ mile to maintain productivity and profitability.

9. Determine the schedule of operations. The most efficient schedule of operations depends on the tract topography, time of year, current and anticipated weather conditions, road construction requirements, and cash flow.

10. Specify tract “close-down” requirements.

Included are: re-grading ruts, installing water bars on abandoned roads and skid trails, reseeding certain landings and roads, removing temporary stream crossing structures, cutting spring poles, slashing tops, removing trash, opening ditches or water turnouts, and any clean-up necessary to leave the tract in acceptable shape. To help reduce time and costs, many of the operations can be scheduled as harvesting is completed on various parts of the tract.

‘The Chickadee’s Guide to Gardening’

Continued from page 1

every day, depending on how many chicks they have. So, an incredible 6,000 to 9,000 caterpillars are required to make one clutch of chickadees.

And chickadees are tiny birds: just a third of an ounce. What if you wanted to support red-bellied woodpeckers in your yard, a bird that is about eight times heavier than a chickadee? How many caterpillars would that take?

What we plant in our landscapes determines what can live in our landscapes. Controlling what grows in our yards is like playing God. By favoring productive species, we can create life, and by using nonnative plants, we can prevent it.

An American yard dominated by Asian ornamentals does not produce nearly the quantity and diversity of insects needed for birds to reproduce. Some might argue that we should just let those birds breed “in nature.” That worked

in the past, but now there simply is not enough “nature” left. And it shows. Many bird species in North America have declined drastically in the past 40 years.

Fortunately, more and more gardeners are realizing that their yards offer one of the most empowering conservation options we have, and are sharing their properties with the nature around them.

By the way, you might assume that my oak was riddled with unsightly caterpillar holes, but not so. Since birds eat most of the caterpillars before they get very large, from 10 feet away the oak looked as perfect as a Bradford pear.

Douglas W. Tallamy, a professor of entomology and wildlife ecology at the University of Delaware, is the author of “Bringing Nature Home: How You Can Sustain Wildlife With Native Plants.”



green horizons

editorial board

Mike Gold, Research Prof., co-editor
MU Center for Agroforestry

Gene Garrett, Emeritus Professor, co-editor
MU Center for Agroforestry

Taylor Wanbaugh co-editor
MU Center for Agroforestry

Joe Alley, Resource Conservationist
NRCS, MO SAF

Scott Brundage, Consulting Forester

Eugene L. Brunk, MDC Retiree

Donna Coble, Executive Director
Forest ReLeaf of Missouri

Lynn Barnickol, Executive Director,
Missouri Consulting Foresters Association

Shibu Jose, Professor, Director,
MU Center for Agroforestry

Rebecca Landewe, Current River Project
Manager
The Nature Conservancy – Missouri

Francis Main, chair,
Missouri Tree Farm Committee

Dennis Evans, chair,
Missouri Walnut Council

Steven Westin,
MDC Private Land Forestry Programs

Clell Solomon,
Mo. Christmas Tree Producers Association

Hank Stelzer, Professor
MU Forestry Extension

Robert Stout
Mo. Department of Natural Resources

Kim Young, Vice President/General Manager
Forrest Keeling Nursery

Bob Ball, Woodland Landowner

CONTRIBUTORS



Missouri Chapter
Walnut Council



MISSOURI
CHRISTMAS TREE
ASSOCIATION



MU School of Natural Resources
College of Agriculture, Food and Natural Resources

Contact Green Horizons

Send story ideas, address
changes and subscription requests
for Green Horizons to:

Mike Gold, Gene Garrett
Green Horizons

University of Missouri
203 ABNR

Columbia, MO 65211

goldm@missouri.edu | (573) 884-1448

garretth@missouri.edu | (573) 882-3647

Issued in furtherance of Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Dr. Michael Ouart, Vice Provost and Director, Cooperative Extension, University of Missouri, Columbia, MO 65211. University of Missouri Extension does not discriminate on the basis of race, color, national origin, sex, sexual orientation, religion, age, disability or status as a Vietnam era veteran in employment or programs. If you have special needs as addressed by the Americans with Disabilities Act and need this publication in an alternative format, write ADA Officer, Extension and Agricultural Information, 1-98 Agriculture Building, Columbia, MO 65211, or call (573) 882-7216. Reasonable efforts will be made to accommodate your special needs.



The Center for Agroforestry
University of Missouri

A Global Center for Agroforestry, Entrepreneurship and the Environment

green horizons

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

Calendar of Events

October 5th

The Emerald Ash Borer and Urban Wood Utilization Workshop

8:30 a.m.-4 p.m. Meet at the KC Zoo Parking Lot, 6800 Zoo Drive Kansas City, MO. \$10 registration
<http://www.forestandwoodland.org/eab-workshop.html>

Oct 17

Missouri Chestnut Roast

10 a.m. – 4 pm. Horticulture and Agroforestry Research Center, New Franklin, MO.
Roasted chestnuts, cooking demonstrations, fresh chestnuts and nut trees for sale, farm tours, music, children's activities, Hickman House tours, many producers and exhibitors.
www.centerforagroforestry.org

Oct 24

Great River Road Chestnut Roast

10 a.m. – 4 pm. Forrest Keeling Nursery, Elsberry, MO.
<http://www.fknursery.com>