

GREEN HORIZONS

Vol. 9 No. 3

Growing Tomorrow's Future Today

Summer 2005

Planting Trees Next Spring?... Prepare Your Site This Fall!



**Hank Stelzer,
Extension
Forester**

I don't know how many calls I received this spring on how to control weeds in new forest plantings. But, they all pretty much went something like this. "I just finished planting my seedlings in an old field. What herbicide can I use to kill the weeds?"

By applying a 3 to 5-foot chemical barrier this fall, the seedlings you plant next spring will get off to a good start.

Weed management in new tree plantings begins with proper site preparation the fall before planting. The objective is to provide new seedlings with a 3- to 5-foot vegetation-free area. This weed-free zone can either be a strip or circle.

If planting in perennial sod (like fescue), the most effective way to kill existing vegetation is with a contact herbicide. Fall applications will provide more consistent control than spring applications. An added benefit is that your planting rows, or spots, will already be "marked" come planting time.

Control can be improved by mowing the area in late August or early September to eliminate existing foliage and treating the tender (and more susceptible) re-growth when at least 10" of new foliage is present.

Glyphosate (e.g., Roundup, Touchdown, many others) is the most effective contact herbicide for perennial sods. The recommended rate is dependent upon the type of vegetation (fescue, brome, bluegrass, etc) and the particular formulation of the herbicide you apply. For tall fescue, the recommended Roundup rate is 2 quarts per treated acre.

Remember that a treated acre is always smaller than an actual acre. This is because you are not treating a solid area; only the area around your trees. For example, planting trees on a 10'x10' spacing will give you 435 trees per acre. If you plan to prepare a 4'-diameter circle around each tree, then your treated area is 1/8 acre [$3.14(2\text{ ft})^2 = 12.56\text{ sq ft}$; $12.56\text{ sq ft per tree (435 trees per acre)} = 5,464\text{ sq ft}$].

Make sure you read the herbicide label at least twice: before you purchase the product and again before you apply the herbicide. An excellent online source for product (**cont. page 3**)

Native plants: The right choice for cleaner water, wildlife habitat and reduced erosion in a buffer system



MDC photo

In the previous issue of Green Horizons, we addressed the topic of some of Missouri's most unwanted plants, exotic invasives. This article offers information about our state's beautiful and diverse native plants and how these are a productive choice in a forested riparian buffer.

Prior to the arrival of the first settlers, Missouri's landscape was vividly colored with native wildflowers (forbs) like Purple Poppy Mallow and Black-Eyed Susans, and millions of acres of native warm and cool-season grasses, trees and shrubs. With the settlement of the state and the later introduction of commercial agriculture practices, many once prominent native species seemed to fade into the horizon. However, distinct benefits are derived by including native plants in landscape plantings, and on a more direct level, into land and forest owners' riparian buffer systems.

Native plants are beautiful and well-suited to Missouri's variable weather. They conserve soil and water and provide the backbone for non-polluting landscapes because they don't need fertilizers or pesticides. They also provide diverse wildlife habitat, require less long-term maintenance than introduced species after plantings are established and contribute to fewer plant losses because they are drought tolerant, winter hardy and resistant to insects and diseases. (**cont. page 2**)

Native plants: The right choice for a riparian buffer (cont. from page 1)

These qualities make native plants an excellent choice for use in a riparian forest buffer system. Riparian forest buffers – one of the five practices of agroforestry – are a critical tool for reducing the impact of byproducts from agricultural practices, including sediment runoff and the filtration of agricultural chemicals that may pollute streams and groundwater. Riparian buffers, which consist of a combination of trees, shrubs, native grasses and forbs placed in distinct strips along the streambank, can significantly improve water quality by removing sediment and chemicals before they reach surface water. A well-maintained buffer zone also helps reduce flooding, prevent soil erosion and create wildlife habitat. Additional income can be generated from a riparian buffer by planting trees with future timber harvest or nut production value, or by planting high-value decorative woody florals, such as Curly Willow and Red Osier Dogwood.

Choosing the right match

Matching the right plants to growing conditions is the key to a successful planting. Whether you are planning a riparian forested buffer or a 10-acre reconstructed prairie, native plants – with proper management – will spread energetically through underground rhizomes, bulbs or other natural, vegetative means.

Dick Schultz, professor, Department of Natural Resource Ecology and Management, Iowa State University, focuses his research on restoration ecology and watershed management and is the leader of the Agroecology Issue Team of the Leopold Center for Sustainable Agriculture, Ames Iowa. Schultz explains that when selecting native species for buffer or prairie plantings, it is important to understand three types of sites. “We break plantings into wet meadows, mesic prairies and dry prairies, and they should each have different sets of grasses and forbs used accordingly,” he says. “In addition, the Midwestern corn belt has the richest soil in the world because it developed under prairie vegetation, and should not need any amendments or additives for establishing native plants.”

In conjunction with a supply of rich soil, native prairie plants have incredible root systems that support the plants in times of drought. Many of the native grass species are known as warm-season grasses because their root system allows them to be competitive during the hot summer months. Compared with the roots of most non-natives, warm-season grasses and flowers have

a deep, extensive root system that helps absorb moisture and prevent erosion. Many species have roots that extend four to eight feet into the soil, while cool-season non-native grasses, such as Kentucky blue grass and smooth brome, extend only a few inches into the soil. The native plants can withstand long periods of dry weather, and do not require watering unless the buffer is established in a small residential or business park setting and is less than one year old.

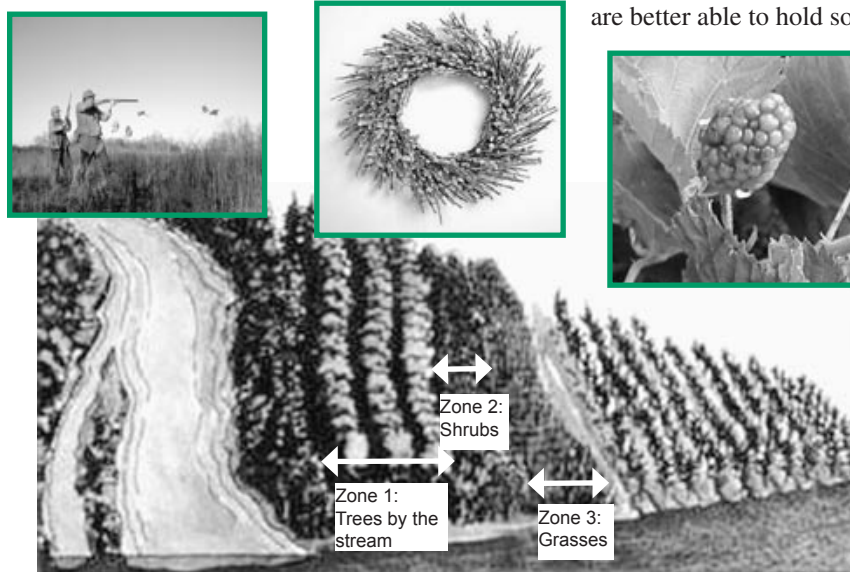
Laurie Brown, conservation ecologist, Patti Banks Associates of Kansas City, Mo., a natural resource planning and landscape architecture firm, also praises the deep root system of native plants.

“By having this greater root system, native plants are better able to hold soils together,” says Brown. “Try taking a clump of turf grass and a clump of native grasses, with roots and dirt, and immerse the roots in a jar of water. You can watch the soil fall off of the turf grass roots, leaving them bare and exposed, while very little soil comes off of the native plant roots.”

In recognition of the habitat value provided by native plants, the Missouri Department of Conservation (MDC) has established the Grow Native! program, which is operated in conjunction with the Missouri Department of Agriculture (MDA).

Grow Native! strives to protect and restore our state’s biodiversity by increasing conservation awareness of native plants and their effective use. By building partnerships among private industry, non-profit organizations, government agencies and landowners, the program aims to significantly increase the demand for and use of native plants on all landscapes. Information about native plant species, landscaping and farm guides and information about native plant workshops and events are available on the Grow Native! web site at www.grownative.org.

“Other resources offered by MDC include landscape guides with detailed information for using native plants in home landscapes, and a farm guide that shows how native plants can maximize conservation benefits. The MDA side of Grow Native! Works with native-plant producers and retailers on marketing and business-plan issues,” says Barbara Fairchild, Grow Native! communications specialist. (cont. page 6)



Riparian Buffers, one of the five practices of agroforestry, are living filters comprised of trees, shrubs, forbs and grasses established in three distinct zones. They enhance filtration of nutrients from surface run-off and shallow ground water, protect the water quality of streams and lakes, and are an effective tool for controlling erosion and providing food and cover for wildlife. Decorative woody florals and berries planted in the shrub zone provide additional income. Lease hunting is another income option, as many types of waterfowl and game birds find habitat in riparian buffer systems.

Prepare your tree planting site this fall! (cont. from page 1)

labels can be found at www.cdms.net. On the website's main page, click on "Labels & MSDS" located on the left side. On that page you will find a search window. Just type in either the chemical name of the active ingredient (if you know it) or the product name to locate the product label.

I also recommend adding a second herbicide containing sulfometuron (e.g., Oust XP) alongside glyphosate to take care of any late-season grasses and broadleaf weeds. Sulfometuron has both pre- and post-emergent activity. As with glyphosate, make sure you carefully read the label as rates do vary depending upon where you live and what species you intend to plant. Here in the Midwest, the Oust XP label will allow fall application rates of 3 to 5 oz of product per treated acre on sites where northern red oak, white oak, ash (green or white), sweetgum or yellow-poplar are to be planted. These rates will also provide some pre-emergent control the following spring.

Brookshire named as new Director of Missouri Forest Products Assn.

One of Missouri's most recognized and well-respected statewide associations has a new CEO, effective June 1, 2005.

Brian Brookshire, 40, was named the new CEO & Executive Director of the Missouri Forest Products Association at an April 21 Board of Directors meeting held in Rolla. Brookshire has worked with Missouri's forest industry for the past five years as a member of the Missouri Department of Conservation. Brookshire began his career with MDC in 1990 and has held several positions: Assistant Resource Forester, Forest Products Marketing Specialist, Wood Products Specialist, Silviculturist and most recently as Forestry Staff Supervisor.

"I have always admired the work ethic and skill demonstrated by those in Missouri's wood products industry," Brookshire said. "The continuing increase and reach of MFPA's services has already made an impact to individuals and companies alike across the state."

Recent expansion of MFPA's services has given the organization a much larger regional and national presence. The Association is one of only 13 agencies in the U.S. that offers heat treating services for lumber being shipped overseas. The service is currently available to nine states. Other significant MFPA services include the Professional Timber Harvester program, the state's first On-line Timber Sale program, Missouri's annual Best Live Christmas Tree contest and the introduction of the Provider Pals program, which will be honored by First Lady Laura Bush at a June 8 dinner in Washington, D.C. MFPA will also host the National Game of Logging Finals at their Midwest Forest Industry Show in St. Louis on Sept. 23 & 24.

MFPA's substantial impact across the state is perfect for native Missourian Brookshire, who grew up in Rolla and received Bachelor's and Master's degrees in Forestry from the University

Sometimes weed control in new plantings cannot be started until the spring of the planting year. If it is begun early enough, before weeds have begun substantial growth, an application of a soil-applied herbicide at least two weeks before planting might get you out of your jam. For optimum tree growth, you may wish to respray dormant seedlings for the first 3 years following establishment.

But, spring weather conditions are usually dicey at best and the risk of damaging actively growing roots of freshly planted seedlings is high if you do not correctly apply the herbicide. So, your safest and surest bet is to prepare next year's planting sites this fall.

of Missouri-Columbia. He is also married to wife Laura and has four children.

The Missouri Forest Products Association's mission is to encourage the wise use and conservation of our nation's natural resources. The industry's complex business concerns also include

safety and environmental issues. MFPA promotes the business of all forest-related industries and encourages closer working relationships among forest product firms, forest owners, producers, and harvesters. This networking helps improve procurement, processing, research, and marketing of forest products.

Learn more about MFPA at www.moforest.org.



The Bid Box... and Related Wood Product Information

Recent reports from the field and comparing reported price trends from a year ago suggest stumpage prices around the state have cooled off; particularly for lumber-grade red oak.

Incoming bids have been low enough that some landowners are rejecting all bids and waiting for higher prices to return. Unless you are losing trees to disease or insects, that is a good strategy. Your forester can help you feel the timber market pulse and advise you when to advertise your sale. Remember when soliciting competitive bids, make sure you clearly advertise that you retain the right to reject any and all bids. This will enable you to leverage the market and obtain the highest price for your trees.

UMCA silvopasture research shows promise of enhanced forage and livestock production

by University of Missouri Center for Agroforestry (UMCA) collaborators Rob Kallenbach, associate professor, Agronomy; Monty Kerley, professor, Animal Science; and Dusty Walter, UMCA Research and Technology Transfer Specialist



Cattle graze among white oak in a thinned forest with select forage established. In the background is unthinned forest from which cattle are excluded. (Research on University of Missouri Wurdack Farm.)

The research program at the University of Missouri Center for Agroforestry (UMCA) consists of eleven research clusters, which bring scientists, collaborators and faculty together in focused, collaborative studies. The Silvopasture Cluster conducts experiments at the University of Missouri Horticulture and Agroforestry Research Center, New Franklin; the Wurdack Farm, Cook Station; and the Beef Research Farm, Columbia. Focus areas include the response of cattle and trees in pastures with planted trees, extending the grazing season with early/late season forages and the influences of management-intensive grazed cattle upon forages and trees. In this article, UMCA collaborators and staff share preliminary information gleaned from current studies and plans for future silvopasture research projects.

Silvopasture is the intentional combination of trees, forage and livestock managed as a single integrated practice. In a typical silvopasture practice, perennial grasses and/or grass-legume mixes are intentionally combined with trees to create unique livestock pastures in one of two ways: (1) between established rows of trees or (2) in appropriately managed natural forests. The proper integration of trees and pasture allows for the management of light and moisture, critical factors related to forage production. The trees not only provide a long-term investment in nut crops or a timber harvest, but also provide the animals shade in the summer and shelter in the winter. In turn, the forage base provides feed for beef cattle which ultimately provides livestock sales for short-term income. A silvopasture practice diversifies farm income, minimizes the need for chemical or mechanical vegetation control and can reduce hay and feeding costs for livestock. (Note: Allowing livestock to graze in a natural woodland area without tree and forage management is not considered silvopasture. Unmanaged forest grazing is never recommended.)

Resolving Silvopasture challenges by Rob Kallenbach

Silvopastoral management creates an environment where trees, forage, and livestock can be developed to their full economic potential. Ideally, the tree species selected for a silvopastoral practice should be marketable - this includes both the wood itself

and other products such as nuts or fruit, offering another source of income in addition to livestock. In a rotational grazing system, a successful silvopastoral practice requires understanding forage growth and managing the timing and duration of grazing to avoid browsing of young tree seedlings and specifically, their elongating shoots. Precautions should be taken, such as adding fencing, to prevent trampling or rubbing of the young trees as well as over-grazing and soil compaction.

With more than 13 million acres of pasture lands dedicated almost entirely to beef production, Missouri is in a position to greatly benefit from the economic and environmental benefits of silvopasture. While silvopasture seems like a natural choice for many producers in Missouri, growing perennial forages for livestock pasture with trees requires careful matching of tree, forage, and animal species. Interactions among all three of the biological systems must be in concert with each other to make the system work. For instance, if the system is not managed well, competition from many forage species reduces tree growth. This is most likely to be a problem in the early phases of tree establishment. Later in the production cycle, the opposite can be true, where shading and competition from trees can reduce forage growth and thus, livestock feed. Another problem that producers observe is that when young trees are not protected from livestock, the trees can be damaged, reducing growth. Still another challenge in silvopasture is that the allelopathic compounds produced can inhibit the growth of susceptible forages and/or trees. Sounds like a lot to worry about, doesn't it? In reality, these challenges are very manageable and are overshadowed by the benefits of the practice. (cont. page 7)

Research conducted by the Center for Agroforestry is revealing that silvopasture offers tangible benefits in both forage production and livestock performance:

- Cool-season grasses grown in silvopastures are almost always of higher quality than that grown in open pastures. For instance, cool-season grasses grown in a pine-walnut plantation had 2 to 4 percentage units more TDN (Total Digestible Nutrients) than forage grown in open pastures.
- Another benefit is that the micro-climate under many tree species favors growth of cool-season grasses in early spring, mid-summer and late autumn. By exploiting this relationship, producers can extend the grazing season during periods of cold or heat stress.
- Trees can increase livestock comfort in winter by providing a windbreak and by providing shade in summer. While it is difficult to put an exact value on these benefits, we have conservatively estimated that they would be worth \$50 per animal annually.
- Livestock production per acre from silvopastures is typically equal to that of open pastures until late in the tree-production cycle. In summary, livestock income is not reduced, but long-term income from trees adds value to the production system.

Landowner Spotlight – Sweet Tradition: For the John Martin family, maple syrup is rooted as deep as the trees on the farm



Story and Photos By Bob McEowen,
Rural Missouri Magazine
Published in Rural Missouri,
March 2005

Like moths to a flame, visitors to John Martin's home place near Viburnum seem to gravitate to the steam. As winter begins to yield to spring, John and his sons light a fire under a stainless steel vat and cook watery tree sap down

to thick, sweet maple syrup. Invariably, each neighbor, friend or relative who stops by to watch finds themselves leaning over the bubbling tank.

"People will stand there and just put their face in the steam," says Scott Martin, who helped stoke the fires this year as the family gathered for a semi-annual ritual of maple syrup making. "It's an interesting sensation. There's a real sweet smell and the steam is real warm but it doesn't burn your face."

It takes nearly 24 hours to cook 300 gallons of tree sap down to a precious six to eight gallons of syrup so there's plenty of time to enjoy the steam. The Martins — especially the male members of the family: 81-year-old patriarch John and his sons Stephen, Scott and Stanton — occupy the time warming themselves over the steam, sampling syrup, playing chess and telling stories.

"This is the closest thing to fishing you can do in February," Scott says as he warms his feet against the steel door of the family's concrete fire pit.

While the men gather around the fire, their wives and children tend to stay inside the family's home until it's time to pour off the finished syrup, Scott says. "They stick their heads out the door and say, 'I can't believe you're sitting out there watching water boil!'"

The description is not far from the mark. Sap from maple trees runs thin and clear and is only vaguely sweet to the taste. But given enough heat and time the watery sap evaporates, leaving a pure, sweet nectar. The imitation maple-flavored corn syrup concoctions sold in grocery stores pale by comparison.

"The first batch that comes off is the best. It's an amber color like honey," Scott says, explaining how the syrup changes throughout the two-week collection and cooking process. "Every batch we take off after that is going to get darker and darker till the last batch will look almost like molasses."

"The last stuff is the best for cooking with. It's a very strong maple flavor, very dark," he says as he dips a fingertip into the simmering vat and quickly lifts it to his tongue for a taste.

Although maple syrup is normally associated with Vermont and other northeastern states, Missouri's maple trees will yield sap if the weather cooperates. Nighttime temperatures below freez-

ing and daytime highs in the 40s cause the sap to rise in the tree. Gathering the sap simply involves drilling a hole in the side of the tree, pounding in a spigot and placing a bucket to collect the steady drips.

"People ask, 'What do you put in it to make syrup? What's your recipe?' There is no recipe," Scott says. "It's just tree sap. That's all it is."

The trick comes in getting the right consistency. "You cook it far enough it turns to sugar," says John as he drips syrup off the end of a spoon, attempting to decide when this batch is done.

John grew up in the valley his grandfather homesteaded in 1886. Their old house is still standing and memories spring forth like the maples that line the creek. John not only remembers syrup making, but the location of trees his father tapped and even which ones yielded the sweetest sap.

"My father made it in kettles years ago. My grandfather made it before my father did," he says. "They just made enough for their own use for one year. Maybe a half a gallon or a gallon."

"He tapped trees with a brace and bit," John recalls. He had five-quart oil cans he got from a service station that he washed out and he hung on the spouts. The spouts were made from alders. He hollowed them out and made a notch for the bucket to hang on."

The Martin family tradition might have ended with John's father, who made his last batch in the 1960s. But sometime around 1996 or '97 a neighbor approached John and asked to tap his maple trees. Coincidentally, Scott visited the family farm that winter and the tradition was renewed.

"I came down and saw all the buckets and asked what was going on. I said, 'We should give that a try,'" Scott says. "We made maybe a gallon of syrup." (**cont. page 8**)

John Martin taps trees for syrup collection. Maple syrup making on the Martin family farm near Viburnum dates back to the 19th century.



Native Plants benefit a buffer system (cont. from page 2)

Why plant natives in a buffer?

“Using native plants in a buffer means incorporating plants that are adapted to the local environment – plants that are able to resist native pests and diseases and can survive extremes in weather conditions for that local area,” Schultz says. “These are plants that are adapted to the local soils, topography and the competition from other plant species in the riparian ecosystem. They provide specific habitat for local wildlife, butterflies, beneficial insects, etc. It is almost always best to go with native species because of their adaptation qualities.”

Schultz explains that natural selection (survival of the fittest) is a powerful reason for the success of local native species. “Introduced species may grow faster, but are susceptible to weather and pests that may be very different from those where the introduced species are native. In our buffer settings, native species also usually have better root systems and provide more protection to the soil and stream compared to introduced species,” he says.

One of the most notable benefits of using natives in a buffer is the creation of effective wildlife habitat. “A cool season grass buffer just does not provide much structural habitat, and because it usually consists of only one or two species, there is little plant diversity. Native grasses and forbs provide different heights, densities, shapes of stems and leaves, different flowering times, and different flowers and fruits so that they can attract many more different species of wildlife,” says Schultz.

The key is to plant as wide a mix of species as possible to achieve the maximum wildlife benefit. Schultz suggests that planting pure native warm-season grass strips with one or two species is more effective than just one species of low growing cool season grass, but planting 5 or 6 species of native grass and 25 forbs provides much more habitat potential. Similarly, planting mixtures of trees and shrubs will provide more diverse structural habitat, but if a landowner is mainly concerned with upland bird habitat, trees provide perches for predator raptors that may prey on the prairie birds.



Before and After: A riparian buffer was installed at the Iowa State University Bear Creek demonstration area in Story County, Iowa, (left), and the difference in 4 years time (right) was dramatic.

Selecting a variety

Brown comments that there sometimes is no “quick and easy answer” to selecting natives. “The types of plants chosen depends upon soils, amount of sunlight, water levels, frequency and duration of flooding, and adjacent land use,” she says. “The type of plants selected is very dependent upon conditions within the buffer.”

In addition, a landowner seeking to establish natives plants in a buffer zone has many choices – there were once more than 150 different species of plants found on native prairies.

Schultz recommends visiting the web sites of reputable prairie seed and supply companies to find a list of possible plant mixtures. “Most nurseries provide different mixtures based on general site requirements and seed cost. It is also important to remember that prairie plants usually take longer to establish than non-native cool-season grasses.

“Native trees and shrubs could include any that are usually available from the local state forest nursery. The main consideration here is selecting species that grow on potentially moist sites, and most nursery information includes the kind of sites that different species grow on,” says Schultz.

Establishing natives in a buffer zone*

“Most buffers are large enough to require seeding to be cost effective,” says Brown. “Plants or plant plugs can be used, but add to the cost of the buffer. If a buffer area is prone to flooding, additional measures will need to be taken (such as erosion control blankets, etc.) to ensure the success of the planting.”

Schultz agrees, and adds that his team sometimes plants cover crops to help control weeds while the natives are becoming established. “Prairie grasses and wildflowers (forbs) are usually started from seed, but wetlands are often planted with plugs. Trees and shrubs are planted as 1-2 year old bare-root seedlings.”

Site preparation for planting the grasses and forbs in a filter strip can take numerous forms. If the site was previously in pasture, burning down the existing pasture vegetation with glyphosate in the fall and spring, and then using a prairie seed drill will result in a good stand of plants. If the site was previously in row crops, light tilling of the surface to kill early weed

species, followed by surface packing with a cultipacker and then using a seed drill will provide a good stand. For woody plant establishment, Schultz suggests that site preparation begin in the fall followed by spring planting. **(cont. pg. 9)**

** Portions of this information from Iowa State University. See page 9 for source.*

Silvopasture research shows promise (cont. from page 4)

Potential of Silvopastoral Practices in Beef Grazing Systems

by Monty Kerley

The primary focus area of silvopastoral research has been the use of forage for hay production or grazing, with a twofold emphasis: the effects of the forage on tree growth, and the effect of the tree on forage growth and nutritive quality.

Silvopasture research indicates that managed forage production (whether used for hay or rotationally grazed for pasture) has little effect on tree growth, while continuous grazing has been shown to reduce tree growth. As expected, new or young tree plantings have little consequence on forage production since they have little impact on light intensity reaching the forage plant. However, when light intensity is altered due to the tree canopy, forage growth and nutritional quality can be affected. Many cool season grasses and legumes show growth that is not reduced when grown in partial shade and their nutritional quality (crude protein content and digestibility) is improved longer into the summer. The extrapolation of these data show that forage quality is better longer into the summer grazing season when forage is grown under shade, as in a silvopastoral practice.

There has been little research conducted



Silvopasture in a managed forest. When thinning a forest to establish the silvopasture practice, or planting trees in a pasture, always remember that light will drive forage production.

studying the effect of silvopastoral practices on the grazing animal. Specifically, what are the effects of a silvopastoral practice on reduced heat stress in the

summer and reduced cold stress in the winter? Cattle typically seek shade in the summer to alleviate the heat load created from exposure to direct sunlight. Likewise, cattle seek windbreak shelter in the winter to reduce the additional cold stress caused by wind. This can be particularly important for cows that are calving where the need is to reduce the cold exposure on the newborn calf. For these reasons, there are few pastures that don't provide access to some form of tree structure that offers shelter. While most pastures provide access to such shelters, almost none of these shelters are managed to provide maximum benefit to the animal, the tree and the forage. It is our hypothesis that silvopastoral practices could be implemented to provide the shelter component to the grazing animal, while simultaneously managing the timber to increase its value and shelter functionality and the forage for grazing and soil cover.

It is our plan to implement silvopastoral practices at the University of Missouri Beef Research Farm in Columbia, Missouri, to study the effects of silvopastoral practices on grazing animal production. Research will be implemented by converting existing unimproved timber to silvopastoral practices and by incorporating tree plantings into open pasture. In addition, we plan to position the silvopastoral areas to facilitate animal waste deposits in the grazing area, specifically emphasizing the prevention of uneven distribution of waste in the pastured area, thus preventing the deposits from being near points of erosion or water movement. This research is expected to provide us data not only on the tree - forage interaction, but also on the animal interaction with the tree and forage components.

Silvopasture on the Wurdack Farm

by Dusty Walter

To produce multiple products from a single land area, as in a silvopasture practice, it is necessary to match plant species to both landowner goals and the ability of a specific site to grow a tree or forage species. When planting (cont. page 10)

3rd Annual Missouri Chestnut Roast!

Saturday, October 29, 2005
10 a.m. - 4 p.m.

Horticulture & Agroforestry
Research Center,
New Franklin, Mo.



Guided tours of the 660-acre Horticulture and Agroforestry Research Center featuring diverse agroforestry practices

Educational booths from Missouri value-added agriculture vendors and University agricultural and environmental research programs

Showcase for Missouri's outstanding agricultural products, including wines; jams and jellies; pecan, walnut and chestnut products; locally produced honey; cheeses & meats

Children's Tent, farm display, family activities and live music by local artists

Informational presentations on the farm's Hickman House, a historic 1819 Georgian cottage and one of the oldest brick homes still standing in the state

Demonstrations of new research on profitable specialty products produced through agroforestry, including pine straw and chestnuts

Free fresh-roasted chestnuts, an emerging value-added crop for Missouri, and samples, displays and sales of Missouri pecans and black walnuts set amidst the beautiful Missouri River Hills

Exhibits by local River Hills landscape artists

Free admission! All activities under tents for comfort, rain or shine! **For maps and information**, visit our web site at www.centerforagroforestry.org or call (573) 882-3234.

Landowner Spotlight: Sweet tradition of syrup (cont. from page 5)

That first year the Martins gathered and cooked syrup the way John remembered his father doing it, down to the brace and bit and iron kettles. The next year, they modernized.

John bought a portable generator and electric drill to tap the trees. Spouts were made from PVC pipe and the sap was collected in 13-gallon plastic buckets. Scott, who studied engineering in college, designed a huge stainless steel vat, 7 feet long and only a few inches deep. The large surface allows the “water” to evaporate more efficiently.

While this generation of Martins has surpassed their ancestor’s methods, they also out-produce them. They put out nearly 170 buckets and typically gather more than 1,000 gallons of sap, which produces between 30 and 60 gallons of syrup. After the syrup is made, the Martins reheat small batches on the kitchen stove and can it in pint and quart Mason jars.

“We haven’t bought any syrup from the grocery store since we started this,” John says. “We keep a jar in our refrigerator all the time. Once a week we eat something that requires syrup. We either have waffles or pancakes or French toast.”

Even with all those breakfasts, the Martins produce far more syrup than they’ll ever use. Some they give to friends, the rest is sold. “We don’t advertise it or anything,” John says. “People just hear about it. We sell all we can make.”

While the Martins like maple syrup, that’s not why they devote nearly two weeks during the winter to gathering and cooking tree sap. Instead, the ritual offers a chance for friends and relatives to get together.

“It’s just a constant flow of people,” Scott says. “Neighbors who live up and down the road will come out when we make syrup. It draws the whole family down to see what you’re doing. I’ve seen more of my family when we’re cooking syrup than I see in an entire year.”

This year the Martins were even joined by international guests as a Romanian couple joined the effort.

All that company — not to mention the work involved in sterilizing the equipment, gathering the sap and cooking the syrup — takes its toll. Some years, the Martins simply decide not to make syrup. And every year John threatens to end the tradition.

“He says that every year,” says Stanton, John’s youngest son, dismissing his father’s annual threat.

“With my father, there’s definitely an excitement I see when we do this. There’s something about him teaching and showing us the things his grandfather used to do and passing it on,” he says. “The day before he left to come down here he was just elated.”

Still John insists he can’t do the work involved in making syrup without help. This year, a farm accident sent him to the hospital

and cut the syrup season short. He’s back on his feet but is even more convinced that the Martin family maple syrup tradition may soon come to an end.

“You know, those buckets of water are a lot heavier than they were a few years ago,” he says, referring to the raw syrup the family collects. “As far as I’m concerned this will be the last year.”



With the help of visiting friends, the Martins collect sap from maple trees located on their property. Cold nights and warm days cause the sap to run.

Timber management and syrup production

John Martin is an expert at “using what’s around.” In addition to his maple syrup business, Martin recycles fallen trees for creating craft wood projects.

“Each spring after leafing out I take a drive through the acreage to see the condition of the trees. If I see one of my black walnut, red oak, white oak, pine or wild cherry trees has died, I have it sawed,” he says. “I have 3 or 4,000 feet or more in the barn that I can use to make furniture or craft pieces, and the rest I can usually sell.”

Most of Martin’s hand-crafted furniture pieces are given to family members as keepsakes, and only a few are sold.

His advice to other landowners considering syrup or other value-added businesses is simple.

“Use what’s out there, what’s already available,” he says. “There are so many forested acres out there, but few of them are utilized. We tap trees on a neighbor’s lot and then pay him back with syrup. We get slabs of wood from a local sawmill to heat the vat for cooking sap.

“Take a look around you and find out what resources you already have.”

Native Plants and Buffers (cont. from page 6)

(For additional tree planting information, see related article, “Planting Trees Next Spring,” pg. 1) If the site has been in pasture, eliminate competing perennial vegetation in 3-foot or 4-foot wide strips or circles where trees or shrubs will be planted. Fall tillage and/or herbicide application (ex. glyphosate) can be used. If the area has been used for row crops, it is desirable to disk the ground in the spring and seed the area where trees and shrubs will be planted with a mixture of perennial rye and timothy grass.

These cool-season grasses are less competitive with trees and shrubs than other species. Additional grass species recommendations are available at your local NRCS or Missouri Department of Conservation office. Mowing two to three times per year is recommended to control broadleaf and grass weeds.

Many forest nurseries carry one to two-year old seedlings of most tree species for planting in zone 1 of the buffer, the managed forest area. Use high quality stock with good root systems. Quality hardwood seedlings should have a minimum of four to five large lateral roots. Trees and shrubs should be planted in early spring, and make sure the planting holes are completely closed so the roots do not dry out.



Maintenance of natives in a buffer zone*

Maintenance of native plants within a buffer will be highest during the first three years after planting.

“This is especially true when using seed,” says Brown. “During the first year, native plants spend most of their energy developing roots, so these areas should be mowed frequently to keep weeds under control.”

Weed control is essential for survival and rapid establishment of prairie plantings in a buffer, and can be achieved through mowing. Mow as high as possible to allow the native plants to develop their above ground food-producing leaves. Mowing is used primarily to cut off the flowers or seed heads of the weed species that are found at the top of the plant. Burning the prairie plantings in the spring during each of the first 3-4 years will also help control weeds and stimulate prairie plant establishment. Once the prairie is established, a burning cycle of 3-5 years is recommended. Burning regimes are best determined by contacting local natural resource managers with experience in using fire. If burning is not an option, periodic harvesting or very careful flash grazing may be used. However, if the buffer is enrolled in the Conservation Reserve Program, using the harvested material or flash grazing are not permitted during the enrollment period of either 10 or 15 years.

For the maintenance of trees and shrubs, mowing and using pre-emergent herbicides are usually needed the first few years. Late fall mowing helps minimize plant damage from rodents during winter months. Mulching is an alternative for woody plants, but

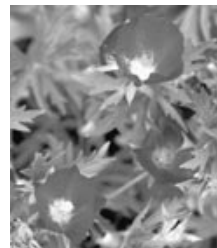
if there are several plants spread over a long distance, mulching adds extra expense. Fertilizing a buffer zone generally is not recommended, as most floodplains consist of very fertile top soil.

The use of fast-growing tree species (willow, cottonwood, silver maple and green ash) ensures rapid growth and effective use of nutrients and other excess chemicals that could pollute water. To remove nutrients and chemicals stored in their stems, it may be necessary to harvest these fast-growing trees every 15 to 20 years. If harvested in winter, these species will regenerate from stump sprouts and maintain root system integrity to offer continued protection of the streambank. In most buffer settings there is also the option of planting some slower growing high quality hardwoods that could provide an income source at a later date.

**Portions of this information from the Stewards of our Streams series, produced by Iowa State University. See www.extension.iastate.edu to access these publications.*

See page 10 for a listing of Internet resources for native plants. See box on page 11 for information about a fall riparian buffer field day!

Some Like it Hot!



MDC photo

Just as some people wilt in the sun and others relish heat, so it is with plants. At this time of year, what we really want are plants that shine in the garden — plants that wow the neighbors and make us look like gardening geniuses. What better choice than natives?

Summer heat and drought can be rough on colorful gardens, but native flowers, shrubs and trees are up to the challenge.

Purple poppy mallow (*Callirhoe involucrata*) is a drought-tolerant, trailing native that produces dozens of showy magenta flowers from June until first frost. The trailing, mat-forming stems make an excellent ground cover. One of our native warm-season grasses that stands up to heat and dry soil is sideoats grama (*Bouteloua curtipendula*). Narrow, blue-gray leaves form a dense clump. Birds and small mammals eat the reddish flowers that dangle along one side of slender stems in summer. The plant turns gold in fall.

Native trees and shrubs that do well in heat and drought include black haw viburnum (*Viburnum prunifolium*). It produces flat heads of white flowers in spring, followed by purple-black fruit, which birds eat. The leaves develop beautiful red fall color. Another adaptable native is New Jersey tea (*Ceanothus americanus*). This compact, 3- to 4-foot tall shrub billows with delicate white flowers in May and June. Birds come to eat clusters of small black fruit in July. It grows easily on rocky soil.

Source: *Grow Native!*

Silvopasture research (cont. from page 7)

trees to a pasture, or managing and thinning a forest, select and favor trees recommended for that site.

Arguably, the most important interaction between the tree and the forage crop is the trees' direct influence on the light available for forage growth. This can be controlled by selecting appropriate tree species and spacings. For example, tree species such as black walnut have a leaf configuration that allows for a filtered light to pass through and will produce less shade than a white oak. Under forested conditions, we often find trees growing off-site. By this we mean that the tree is not growing on a site where we would expect it to perform best. If the appropriate tree species are selected for your site and soil, you are then free to manage spacing between your trees in order to create the best shade/light environment for forage production and livestock benefits.



Rotational pasture management is always recommended in the silvopasture practice. When establishing trees into existing pastures, space tree rows to allow for their growth and development. In this photo, the rows of trees are 30 feet apart.

One of the best examples of hardwood silvopasture is located on the University of Missouri Wurdack Farm in south central Missouri. This is the third year since the establishment of an experimental silvopasture practice in an Oak-Hickory forest type. To establish the silvopasture, we chose 25 acres of forested land on north-facing slopes, then thinned the forest to approximately 50-percent light/shade levels and seeded appropriate cool-season forages (Kentucky 31 Tall Fescue, red clover, annual lespedeza). Proper forage management allows us to identify the effects that controlled grazing of cattle may have on tree growth. When implementing the thinning, we applied a slightly modified version of a practice known as crop tree release (CTR). In CTR, emphasis is placed on selecting the best trees on a given site and thinning/removing all other competing trees around them. We also designed removal of competition based on the crown size of each crop tree, resulting in 40-60 percent shade. White oak was favored on the sites.

A great deal of skepticism exists on the impact controlled grazing may have on the remaining trees. Critics of this practice have some valid concerns. In the past, continuous grazing of, and access to, woods by livestock was shown to have a very negative impact on soil erosion and the regeneration (seedlings) of the forest. However, at this time the use of management intensive

grazing (rotational grazing) has resulted in a forage stand that is continuous, and we have not seen any erosion problems. Additionally, we are not relying on natural reproduction (which in many unmanaged forests is lacking to begin with), but have planted improved white oak seedlings and placed a welded wire cage around each of them. This allows us to place seedlings in selected locations (looking toward their future shade value) and helps assure their survival and growth by providing protection from livestock and deer browsing.

Although the final numbers have not yet been calculated, we hope the Wurdack Farm will illustrate the advantages a properly managed silvopasture practice can provide to Missouri land and livestock owners. We fully expect that the enhanced growth of the high value white oak trees remaining following our harvest/thin, in conjunction with regular forage and beef production, will provide long-term positive income to the farm.

Internet resources for native plants:

The Ion Exchange: Offers more than 200 high-quality native tall-grass prairie seeds and plants for wetlands, savannas or prairies. www.ionxchange.com.

Grand Prairie Friends: Offers addresses of prairie nurseries in various Midwestern states and a list of species that could be planted. www.prairienet.org/gpf/nurseries.html.

Iowa State University Extension: Additional information on designing, establishing and maintaining riparian buffers is available from the Stewards of our Streams series produced by Iowa state University Extension. www.extension.iastate.edu.

Grow Native!: A joint program of the Missouri Department of Conservation (MDC) and the Missouri Department of Agriculture (MDA), Grow Native! offers species information, landscape and farm guides, updates on native-plant events and workshops, and a listing of native plant sources. www.grownative.org.

USDA NRCS: Offers several publications to help in planning and maintaining buffers. www.nrcs.usda.gov.

Hamilton's Native Nursery & Seed Farm: Located in Elk Creek, Mo., Hamilton's offers a large collection of native seeds, seed mixes, roots and potted plants, as well as information about planting. www.hamiltonseed.com.

Pure Air Native Seed Company: Offers native warm season grasses, wildflowers and legumes for Bobwhite quail and conservation habitat needs. Located in Novinger, Mo. www.oberlel farms.com.

Missouri Wildflowers Nursery: Located in Jefferson City, Mo., with an extensive collection of native Missouri perennials, both seeds and plants. Plants are nursery propagated. www.mowildflowers.net

Missouri Department of Conservation: Web site has a listing of local state forest nurseries. www.conserva tion.state.mo.us.

The Back Page: A Tribute to Larry Harper

by Gene Garrett, Director, University of Missouri Center for Agroforestry

On a rare occasion in our lives, we have the good fortune to meet and get to know an individual who greatly influences the way we think. Larry Harper had that effect on me.

Larry was born July 4, 1942 in Butler, MO. He graduated from the University of Missouri with a degree in Agricultural Economics in 1963 and went on to become a highly respected agriculture communicator as editor of the Missouri Ruralist Magazine. He was a strong supporter of Missouri agriculture and served each of our recent governors (beginning with Governor 'Kit' Bond) in various advisory capacities. He was also an avid supporter of the University of Missouri and always made himself available when called upon to serve the College of Agriculture, Food and Natural Resources.

Larry was a family farmer and a strong advocate of preserving America's rural lifestyle. He firmly believed that agroforestry could provide an economic boost to the family farm. Moreover, he put into practice what he preached. He transformed his family farm near Butler, Missouri from a row-crop enterprise into a highly diversified mix of grafted black walnut, inter-cropped with pumpkins, Indian corn and a variety of other niche crops or

livestock grazing the alley ways.

He was once quoted as saying that agroforestry had helped save his farm. However, when asked how profitable agroforestry was, he would only say "I am now making more than what I used to be losing" – spoken like the true farmer that he was!

Larry passed away on May 23rd, 2005, and his loss leaves a void that will be difficult to fill. He was a gentleman, a scholar and



Larry Harper carefully tending his black walnut trees.

truly a man of influence in the agricultural community. Our thoughts and prayers are with his family.

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Riparian Buffer Field Day: Managing Riparian Forests and Riparian Buffers

When: Oct. 27, 2005

Where: MU Horticulture & Agroforestry Research Center, New Franklin, Mo.

For Who: Resource professionals and landowners who work in (or have) streamside forests

Cost: FREE

The University of Missouri Center for Agroforestry and its collaborative researchers are hosting this field day to detail current research on riparian buffers and their application on the land. Topics include methods of holding and outplanting trees and shrubs in the fall, planting configurations on the landscape, species selection, riparian buffer function and design, and wildlife management. Registration information available soon at www.centerforagroforestry.org; or contact Julie Rhoads at (573) 882-3234 or email rhoadsj@missouri.edu.



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Calendar of Events

July 31 - August 3, 2005: National Walnut Council Annual Meeting, Moline, Ill. Themed "Reality Forestry," the meeting workshop topics include woodland wildlife management, resource management, harvesting, seeding, forest farming and specialty wood products. A field tour to the Loud Thunder Forest Preserve will also be included. To register, or for more information, visit www.walnutcouncil.org.

July 31 - August 3, 2005: Northern Nutgrowers Association 96th Annual Meeting, Pella, Iowa.

NNGA meetings provide a forum for the grower and serious hobbyist to share their recent findings and tours of orchards and facilities to observe planting, cultural, harvest, processing and marketing practices. In 2005, Pella, a beautiful and historic Dutch village with canals and windmills, will be host to the meeting. For more information, send e-mail to icomserve@aol.com with "NNGA Meeting 2005" as the subject; or visit <http://icserv.com/nnga/>

Aug. 20, 2005: Summer meeting of the Missouri Walnut Council, held at farm of Lloyd Grafton. Contact Scott Brundage by email at brundage@socket.net for more information.

Sept. 21 - 24, 2005: 45th Annual Black Walnut Festival, Stockton, Mo. Event features a carnival, parade, demonstrations by local crafters, a most interesting nut wizard relay race, and of course, plenty of black walnuts. Contact the Stockton Chamber of Commerce at (417) 276-5213 for hours and information.

Sept. 27 - 29, 2005: Management Intensive Grazing, a three-day seminar sponsored by the University of Missouri Forage Systems Research Center, Missouri Forage and Grassland Council (MFGC), and the Green Hills Farm Project. View program or register online at <http://agebb.missouri.edu/mfgc/mfgconf.htm>. For more information, contact Joetta Roberts, MFGC, at (573) 499-0886 or email mfgc@mchsi.com.

Oct. 27, Riparian Buffer Workshop, Horticulture and Agroforestry Research Center, New Franklin, Mo. Hosted by the University of Missouri Center for Agroforestry. For more information, contact Julie Rhoads at (573) 882-3234 or by email at rhoadsj@missouri.edu. Additional information to be posted online at www.centerforagroforestry.org. (See box, page 11)

Oct. 29, 2005: 3rd Annual Missouri Chestnut Roast, Horticulture and Agroforestry Research Center (HARC), New Franklin, Mo. The Chestnut Roast is an outreach and educational opportunity featuring guided farm tours of the 660-acre HARC farm, agricultural exhibits and displays, free samples of fresh Missouri roasted chestnuts and chestnut dishes, agroforestry and cooking demonstrations, a children's tent and several Missouri value-added food vendors, featuring Missouri black walnuts, chestnuts and pecans; meats and cheeses; specialty condiments and wines. Free admission and free parking. Hours are 10 a.m. to 4 p.m. Visit www.centerforagroforestry.org for more information. (See sidebar, page 7)