

GREEN HORIZONS

Vol. 9 No. 2

Growing Tomorrow's Future Today

Spring 2005

Managing a Forest, Managing a Herd: Improving the Financial Return from Your Forest

Skip Mourglia, Southwest Missouri RC & D Staff Forester



Managing your forest can be compared to winnowing small calves and underperforming cows from the herd. By managing the best trees, and those on appropriate sites, productivity and yields will be optimized.

A healthy forest of vigorously growing hardwood trees can yield numerous, profitable thinnings over your lifetime IF you manage it like your animal herd. The unhealthy and poorly performing trees should be culled from the forest to provide more growing space for high quality trees. Thin the forest too much, however, and you encourage trees to grow as they do in pastures, with limbs low down on the trunk. This lowers the commercial value of your growing stock.

Attractive financial returns don't grow on sick trees or trees with poor genetics. Your animal herd isn't improved by leaving your worst animals. Similarly, your forest isn't improved by cutting out all the "good" trees and leaving the junk. That's called High-Grading. Oh, sure.....you might think you made decent money on your once-in-a-lifetime timber cutting. But that's only because you don't understand how much more you can make over time by practicing "Low Grading." Your initial thinning will produce less income per acre with Low Grading, because you are removing the lowest quality merchantable trees along with trees that are mature. But that changes as the quality of your forest

continues to improve. As quality improves, so does your rate of return. The result of decades of High Grading can be seen all across the landscape. Forest quality has declined tremendously due to this practice.

High Grading often leaves trees that are slow-growing or have poor growth form due to genetically inherited traits. These inferior trees produce the seeds that form the next generation of trees in your forest. Poor genetics breeds more poor genetics. Livestock producers understand this well. High Grading leaves small trees that are old and have stagnated. They stopped growing at a decent rate years, if not decades, ago. They were stunted by surrounding trees that competed better for sunlight and moisture. These stagnant trees seldom return to a reasonable rate of growth no matter how much growing space they get. A stagnant, six-inch diameter oak is often 65-75 years old, the same age as the 20-inch diameter sawlogs harvested off the same tract. (cont. pg 2)

Exotic Invasives: Missouri's Unwanted Plants

Adapted from MDC Botanist Tim Smith's article "Plants That Won't Stay Put," April 2001 *Missouri Conservationist*



Once in the forest canopy, the dense tangle of kudzu vines shades out ALL vegetation beneath it.

Think of any one of Missouri's unique ecosystems as a precision watch. The numerous levers, springs and cogs in the watch fit together as a harmonious, functioning whole. Introducing exotic species can be compared to opening the back of the watch and throwing in some additional parts. They may stay out of the way and have no effect. They might cause it to run fast or slow. Or, the extra part may fall into just the right spot to stop the watch completely. An example of a "stopped-watch" ecosystem might be a formerly diverse southern Missouri hardwood

forest that has become completely covered by kudzu – an exotic vine – to the extent that only kudzu grows there.

For thousands of years, Missouri's native plants have competed for available space, light, soil, water, and nutrients. Along with their natural enemies (insects and diseases) (cont. page 4)

Managing a Forest, Managing a Herd: Improving the Financial Return from Your Forest (cont. from page 1)

An unmanaged forest is doing well to produce an annual return on your investment of 2-3%. However, practicing proper forest management **can increase that to a 6.1% annual rate of return** on an average Ozark site after just 10-15 years.

Forest management **requires time** to reap the financial benefits. Sounds like most investment strategies, doesn't it? Tree crops are grown over decades, not in a mere handful of years. Many side benefits can be realized from the forest while waiting for trees to reach maturity. You can lease recreational uses such as hunting, hiking, camping, and mushroom picking to help offset the expenses of taxes, insurance, etc....all while still using the property for your own enjoyment, including hunting. Both the Forest Landowners Association, www.forestlandowners.com, and the Missouri Forest Products Association, www.moforest.org, offer hunting lease insurance at very reasonable rates for both landowners and their hunting lessees.

Other sources of income can come from harvesting firewood, mushrooms, berries, wild grapes, hazelnuts, hickory nuts, walnuts, woody burls, and decorative dried "woody florals" (pinecones, dried mushrooms, bittersweet, etc.). Many "value-added" products can be made from these such as dried mushrooms, wild grape and raspberry jellies, cracked nuts, decorations for florist arrangements, carved walking sticks, and bowls turned from woody burls. Visit the MU Center for Agroforestry website at www.centerforagroforestry.org for additional information about value-added products.

To learn more about profitable forest management and locate a forestry professional near you, contact Hank Stelzer, MU Forestry Extension, at (573) 882-4444 or email stelzerh@missouri.edu.

Federal and state tax laws offer tax advantages to managed forest landholdings. For additional information, visit www.timbertax.org. An Agroforestry in Action guide to tax considerations is available at www.centerforagroforestry.org; select the Publications link.



Cattlemen do not sell their cows without knowing such factors as coat condition, frame size and weight, so why sell your trees without knowing how many board feet you have, by tree species and quality?



Forest management that selectively removes over-mature or low value trees puts a land's growth potential into better trees, and may result in even bigger profits in the future.



Skip Mourglia, USDA NRCS Forester, "thumps" a tree during a demonstration of forest management at the Oct. 30th workshop held at Mt. Vernon, Mo.

Correction:

The editors of Green Horizons failed to include the USDA Southwest Missouri RC & D as a sponsor of the agroforestry workshop, held Oct. 30th at the University of Missouri's Southwest Research Center, Mt. Vernon, Mo. The story appeared in the Winter issue, pages 6-7. In addition to the Southwest Missouri RC and D, sponsors were the Kansas Farmers Union, Missouri Farmers Union, National Farmers Union and the University of Missouri Center for Agroforestry.

More than 40 landowners attended the event that highlighted trees as a sustainable economic resource and included workshop topics on integrating forestry management on the farm; nuts as a growing market; lease hunting as an additional income source; non-timber products and managing and marketing a woodlot.

The contact information for Skip Mourglia, USDA NRCS Forester and workshop presenter/co-organizer, was also listed incorrectly. Skip can be reached by email at skip.mourglia@mo.usda.gov, or by phone at (417) 732-6485.

We apologize for these errors.

Plant it Right: Urban Tree Planting Tips To Make the Most of Your Trees

While nursery professionals recommend planting trees in late fall or early winter, for a variety of reasons most people associate this arbor activity with spring. If you are planning to plant a tree in the coming weeks, consider the following points.

THINK BEFORE YOU PLANT. Place a wooden stake where each tree will be planted. Now step back and envision that four-foot tree you are about to plant 20 years from now when it is 40 feet tall with a crown spread of 30 feet. Is it too close to the house? What about overhead power lines or underground water, gas or sewer lines? It is much easier to readjust stakes than planted trees.



Container grown seedlings are effective in urban tree plantings.

BIGGER IS NOT BETTER. Homeowners often forego bare root seedlings because of their relatively small initial size compared to container-grown or balled and burlapped (B&B) trees. They want instant shade and worry-free mowing. But, bare root seedlings usually have a better balance between their shoots and roots. Oftentimes in a few short years they can equal or even surpass their big brothers and sisters. To be in some sort of balance, a B&B tree with a trunk diameter of 2" should have a soil ball that is at least 24" in diameter. Remember that the more instant shade gratification you desire, the bigger the tree, the bigger the soil ball, the bigger the expense, and the bigger the risk of failure.

SELECT A HEALTHY TREE. The bark should be intact and there should be no missing buds, particularly at the top of the main shoot. Missing terminal buds will create a "bushier" tree until one of the lateral branches assumes dominance and in most instances such trees will require corrective pruning to help the tree regain its natural shape. Bare root seedlings should have a fibrous root system. Container-grown and B&B trees should have a firm, symmetrical soil ball. Roots should occupy the entire volume of the soil ball, but should not be a solid mass of circling roots. This can lead to poor anchorage or even girdling (strangling) of the trunk (see GH Vol. 8, No.2 for more information on stem girdling roots).

PLANT IT RIGHT. For bare root seedlings dig a hole to fit the root system. Set at the same depth the tree grew in the nursery. Make sure to spread the roots out as you replace the soil. Fill the hole half full of soil and tamp well. Finish filling hole and tamp with feet.

For container-grown and B&B trees, dig the hole only as deep as the soil ball and 2-3 times wider than its diameter. If no roots larger than 1/2" in diameter are found by probing 2" deep, on top of the ball, plant the tree 2-3" higher than the ball depth and

remove the excess soil from the top of the ball. In addition you should loosen the surrounding soil 8-12" deep. This area should be equal to two to three times the diameter of the tree's soil ball.

CLAY SOIL IS BAD. Clay soils do not foster good root growth. If you can form a soil "ribbon" greater than one inch long by pressing a moistened sample between your thumb and forefinger your soil contains too much clay. Peat moss and compost can help create a more favorable environment for root growth. But, these should be used in moderation (less than 20% of the soil volume) or else new roots will never want to venture out into the "real world".

KEEP TURFGRASS IN CHECK. Turfgrass roots compete strongly with tree roots for water and minerals. Establish a
(cont. pg. 7)

Grants Available for Urban Tree Planting, Maintenance

Shade that blocks the searing heat of summer and leaves that generate the air we breathe are among the many benefits of caring for trees in your community. The Missouri Department of Conservation has help for starting tree-care projects through the Tree Resource Improvement and Management (TRIM) program.

TRIM is a partnership of the Conservation Department and the Missouri Community Forestry Council. It provides reimbursements of up to \$10,000 to public schools, government agencies and non-profit groups for tree planting and management on public land.

Projects eligible for TRIM funding include tree inventory, removal or pruning of hazardous trees, tree planting and training of volunteers and city or county employees in tree care.

Each applicant submits information about project cost and funding sources, project site maps and drawings, management plans and a letter of approval from the governmental body that owns the proposed project site. **The application deadline is June 1.**

Grants are awarded competitively. A panel of judges assesses each proposal for its value to the community, thoroughness of the tree management program, economic feasibility and the applicant's ability to promote, improve and develop a community urban forest.

Grant recipients receive up to 60 percent of total project funding. Communities with the National Arbor Day Foundation's Tree City USA designation are eligible for an additional 15 percent cost-share.

Grant application writing workshops will be offered at locations around the state in early April. For workshop information or to get a TRIM grant application and workbook, write to Community Forestry Coordinator, Forestry Division, Missouri Department of Conservation, P.O. Box 180, Jefferson City, MO 65102-0180.

Exotic Invasives: Missouri's Unwanted Plants (cont. from page 1)

they have produced a precise natural world that is (or at least was) in balance. In the last few hundred years, a host of exotic plants have arrived here from all over the world and tilted the balance of the struggle.

Some exotic plants, also known as non-natives, were brought here intentionally and have not aggressively spread. Tulips, originally from Asia, are an example. They stay where we plant them and require special watering, fertilizing, and protection from the heat or cold to keep them healthy.

Other non-native plants, whether brought to the state by design or by accident, have spread so rapidly into native ecosystems due to the absence of their natural enemies that kept them in check back home that they out-compete and replace our native species. A few readily identifiable problem species are described below.

Autumn Olive (*Elaeagnus umbellata*). Native to China, Japan and Korea, autumn olive was widely planted in the past for food and cover for wildlife, windbreaks and erosion control. It can be found away from planting sites in old fields and pastures, along roadsides and in open forests. Capable of reaching heights up to 20', it can easily choke out native forbs, grasses, shrubs and small trees.



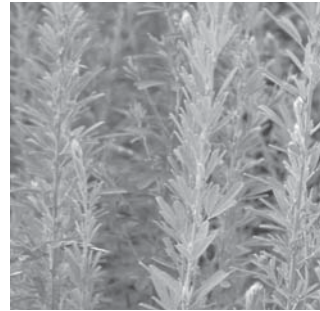
Autumn olive was widely planted in the past for food and cover for wildlife, windbreaks and erosion control. It can reach heights of 20 feet.

Shrub or Bush Honeysuckles (*Lonicera maackii* and *L. morrowii*). In contrast to our native twining vine honeysuckles, these Asian species are shrubs. They have been planted as ornamentals and wildlife food plants, but now often replace native shrubs and eliminate woodland wildflowers from the forest floor. This completely changes the character of the forest understory to the detriment of native plants and animals.

Japanese Honeysuckle (*Lonicera japonica*). This climbing vine was brought from Japan in 1806 for use as ground cover. Now common over much of the eastern U.S., this exotic aggressively colonizes open or forested areas. It can completely cover shrubs and low-growing plants, producing dense shade that prohibits growth beneath it.

Kudzu (*Pueraria lobata*). Six inches a day is the documented growth rate of this vine. Kudzu was brought from Japan in the late 1800s and promoted as livestock forage and erosion control. More aggressive than Japanese honeysuckle, it spreads over the ground and climbs on anything. Once in the forest canopy, the dense tangle of vines shades out ALL vegetation beneath it. Its seeds can be dispersed over long distances further increasing its spread. Cold winters can limit kudzu, but cold-hardy plants have now been found along the northern tier of counties in the state.

Sericea lespedeza (*Lespedeza cuneata*). This perennial legume was brought from eastern Asia and has grown in Missouri since



Sericea lespedeza can choke out native plant vegetation. Photo: Jim Rathert, Missouri Dept. of Conservation

the 1930s for erosion control along roads and pond levees. Although not as palatable as native lespedezas, it is still promoted in the southeastern U.S. as livestock forage. In Missouri, this plant chokes out native vegetation found on prairies, glades, savannahs and gravel bars.

Purple Loosestrife (*Lythrum salicaria*). This perennial plant was brought from Europe and Asia in the 1800s for use as an ornamental and as a nectar source for honeybees. This species is so invasive that it has joined the likes of johnsongrass on Missouri's noxious weed list. It has the ability to dominate freshwater marshes, wet prairies and other wetland habitats, completely eliminating wetland flora. It thrives in full sun, where a single plant can produce 300,000 tiny seeds in one season.



Right: Purple Loosestrife is one of Missouri's most noxious weeds and thrives in full sun.

The following websites contain the latest information on invasive exotic plants in Missouri:

<http://www.mobot.org/mobot/research/> This site maintained by the Missouri Botanical Garden categorizes plants by their invasiveness and includes photos and links to the Missouri Vegetation Management Manual and other references.

www.mdc.mo.gov/nathis/exotic/ This Missouri Department of Conservation site also links to the Manual and Missouri Conservationist articles on exotic species topics.

tncweeds.ucdavis.edu/esadocs.html The Nature Conservancy's invasive weeds site contains photos and downloadable documents with control information for many U.S. weeds

www.invasivespecies.gov This site contains profiles and images of invasive species.

Missouri Tree Farm Conference Continues to Grow

Attendance at the annual Missouri Tree Farm Conference continued its upward growth trend as more than 130 landowners and professional foresters from across the state participated in the conference's Silver Anniversary, February 25-26, at the beautiful Stoney Creek Inn in Columbia. Conference Chair, Hank Stelzer, attributed the increased attendance to timely topics and relocating the event back to a more central location within the state. "Hosting the event in Columbia really helped draw absentee landowners from St. Louis and Kansas City," Stelzer said.

Dr. Bill Hoover, one of the nation's top timber tax experts, kicked off the two-day conference with a forest estate planning workshop for 60 landowners. The Friday evening Landowner Exchange brought more than 50 individuals with forest ownership ranging from 5 to 5,000 acres to talk about various aspects of forest management and what has (and hasn't) worked in their woodlands.

The Saturday sessions drew the largest crowd. Landowners heard from the Missouri Department of Conservation's (MDC) Nursery Superintendent, Greg Hoss, as to the latest species being grown at the state nursery in Licking, Mo. MDC Botanist, Tim Smith, introduced conference attendees to the litany of exotic non-native plants that are threatening the Missouri landscape. Mark Coggeshall of the University of Missouri Center for Agroforestry discussed the finer points of pruning high-value hardwood species.

Following a luncheon where the state's various outstanding Tree Farmers and Tree Farm Inspectors were recognized, Dr. Bruce Moltzan, MDC Forest Pathologist, gave landowners the latest information on several emerging insect and disease threats. Most notable is the Emerald Ash Borer (EAB) that is currently ravaging ash trees in the Central Lake States. The conference concluded with an excellent quail habitat forum presented by MU Wildlife Extension Specialist, Bob Pierce, MDC Private Land Program Supervisor, Bill White, and MDC Resource Forester, Brian Schweiss.

Throughout the conference attendees had the opportunity to meet and talk with representatives from various professional organizations such as the Missouri Consulting Foresters Association, Grow Native, the MU Center for Agroforestry, and the Missouri Forest Products Association. A popular exhibit was the Eastern Ozarks Forestry Council and their DVD presentation highlighting ongoing research examining the feasibility of using the latest technology in mechanized thinning to bring more acres of Missouri's forests under management in an environmentally friendly way.

Early review of conference evaluations revealed that attendees liked the single-track conference format. Stelzer hopes that by listening to participants' feedback and expanding the first day of the conference to include field demonstrations at the MU Horticulture and Agroforestry Research Center in nearby New Franklin, the conference will continue to grow and become a premier event for woodland stewardship education.

The Bid Box

In February of this year, the competitive bid process netted these Missouri forest landowners the following results:

In Lafayette Co., six bids were received from an invitation to bid on 447 black walnut trees containing an estimated 54,000 bd. ft. (Doyle Scale):

\$73,643 An 84% difference between high and low bid.

\$73,555

\$63,250

\$61,300

\$55,528

\$40,000

In Adair Co., four bids were received from an invitation to bid on 96 black walnut trees containing an estimated 18,200 bd. Ft. (Doyle Scale):

\$27,270 A 110% spread between high and low bid

\$24,500

\$20,244

\$13,000

In Lafayette Co., four bids were submitted for a mixed hardwood sale containing an estimated 54,000 board feet (Doyle Scale):

\$27,600 A whopping **250% difference** between high and low bid!

\$18,860

\$10,000

\$ 7,889

Remember... Know what you are selling. Have a professional forester paint mark your crop trees and prepare an inventory of your sale trees.



Participants at the annual Missouri Tree Farm Conference, held in February in Columbia, Mo., learn about selecting proper tree species from MDC Forest Nursery Supervisor Greg Hoss. More than 130 land and forest owners attended the event.

Management Practices to Enhance Bobwhite Quail Habitat



by Dusty Walter, UMCA

Many who grew up hearing the whistle of bobwhite quail first thing in the morning or late in the afternoon, or enjoyed being startled by a covey flushing as they walked a fence row, have noticed that these pleasures do not occur nearly as often as some

years back.

In fact, Northern Bobwhite Quail (*Colinus virginianus*) populations have progressively declined since the 1880's (Guthery 2002). In a recent report submitted by the Southeast Quail Study Group Technical Committee (Dimmick, et al. 2002) entitled The Northern Bobwhite Conservation Initiative, it is noted "that in some states the northern bobwhite could be approaching extirpation by the end of this decade".

The challenge of quail management is twofold. The first problem is rooted in a need for an increased understanding of the population dynamics associated with the manipulation of area-wide vegetation through land management practices. Studies have indicated that quail are associated with landscapes that are relatively diverse and contain moderate amounts of row crops, grassland and abundant woody edge. Furthermore, quail are likely to benefit from habitat that is evenly and appropriately dispersed over a given size land area. The second problem is one of economics. In order for landowners to adopt land management practices that benefit quail populations, that management strategy must be shown to improve the economic opportunities associated with owning and managing a piece of ground. Few are the landowners or farmers who can afford long-term management which results in expenses, but offers no chance to recover the associated cost. If we desire for quail to be a continuing part of our farms and hunting camaraderie, we must develop a better understanding of how to integrate their habitat while keeping farms economically productive.

Agroforestry consists of five distinct practices that seek to incorporate trees and woody species of vegetation into productive farming practices. Agroforestry practices can create landscapes comprised of crops and/or grasses, with woody plant species in an evenly dispersed pattern, while providing the opportunity to maintain production from a majority of the land area. Many, if not all farms, contain these landscape or habitat types (crops, grasses and woody species) to some degree or another, yet the desire to maximize production has led to increased acreages of

mono-cropping and therefore a reduction in available acreages on farms that are usable space (discussed later) for quail. In the temperate United States, agroforestry consists of five main practices:

1. Alley Cropping
2. Silvopasture
3. Riparian Forest Buffers
4. Windbreaks and
5. Forest Farming.

Of these, all but forest farming can provide the proper manipulation of vegetation to develop or improve quail habitat on an area-wide basis, while simultaneously maintaining the land's economic productivity. While alley cropping, windbreaks (spaced appropriately) and silvopasture practices may stand out as benefiting quail, the riparian forest buffer practice is typically associated with an edge of the property or landscape, and in most cases should be viewed as a component of a broader farm management plan that also works to improve the interior portions of an area for quail.

When developing land to encourage quail populations, it is extremely important to objectively evaluate the usable land area accessible to quail. For instance, although soybeans are a great quail food, a square 100-acre soybean field only has usable ground around the edges, and then only if adequate cover is present. The identified agroforestry practices provide a method to develop habitat in agricultural systems while maintaining productive farming practices and better dispersing habitat across the farm. This is the concept of developing quail "usable" landscapes. Choose appropriate species of trees, shrubs/brambles, forages, crops and forbs/weeds, and then plant mixes at appropriate intervals across a given farm practice. By developing more useable areas across farm landscapes, quail populations will have their greatest chance to be heard, flushed and otherwise enjoyed again as a part of our farms.

Regardless of the goals for a farm, land management that incorporates one or more agroforestry practice offers opportunities to improve the habitat for quail while practicing sound stewardship of soil, forest and water resources – and continuing to preserve the income sources that can keep farmers farming.

The following are some excellent resources available to assist you in evaluating your land's current potential as quail habitat:

(cont. page 9)



Field windbreaks provide quail excellent avoidance from prey and weather protection.

Joining Walnut Council is a Win-Win Situation

by Scott Brundage

As past Missouri Chapter Chair of The Walnut Council and Other Fine Hardwoods Association, I personally invite you to join our fast-growing organization and gain access to some of the best information available to forest landowners with a serious interest in properly managing their woodlands. Becoming a member is a win-win-win situation. How?

Win #1: Make money. Quality timber is worth many times more dollars than low-value, unmanaged timber. For example, the best black walnut veneer butt logs I sold last year brought \$10 per board foot and the best white oak brought \$4 per board foot “on the stump” (the dollar amount that you the landowner receives). Low-value pallet and blocking timber averaged a mere 8 cents per board foot. Plus, a managed forest increases the value of your land. Remember, you are going to do one of two things with your land: keep it or sell it. Through active management you increase the value of both options.

Win #2: Save money. Here are just three ways joining The Walnut Council can save you money in managing your woodlands.

- A \$50 discount on professional forestry services (marketing timber, preparing management plans, tree planting, pruning and other timber stand improvement practices) from consulting foresters who are Walnut Council members
- Discounts on chemicals used in timber stand improvement and weed control in plantations
- 10% discount on all Stihl equipment (chain saws, pole prun-

ers, weed eaters, leaf blowers, pruners, axes, etc) at selected locations in Columbia, St. Louis, Kansas City, and Springfield, Missouri. These benefits can save a landowner much more than the annual \$30 Walnut Council membership dues.

Win #3: Leverage money. With member support, the Missouri Chapter of The Walnut Council leveraged a dollar-for-dollar matching-gift opportunity through the MU College of Agriculture, Food and Natural Resources (CAFNR) that generated \$1,500 for undergraduate research and education in the MU School of Natural Resources.



A \$750 check for undergraduate education is presented by Scott Brundage, Walnut Council, to Gene Garrett, interim director, MU School of Natural Resources. The award is part of a matching gift opportunity sponsored through the MU College of Agriculture, Food and Natural Resources. From left: Dusty Walter, UMCA Technology Transfer Specialist; Scott Brundage, past Walnut Council chair; Gene Garrett; and Harlan Palm, Walnut Council vice president.

Some of the most valuable trees in the United States grow right here in Missouri (Black walnut, white and red oak, black cherry, to name a few). The potential for excellent timber income is in your own back forty if you plan and manage for it. Good timber management encourages wildlife, particularly deer and turkey; provides recreational opportunities; and improves water quality.

Through attending Walnut Council field days, reading the up-to-date literature, getting answers from experienced members, and completing management practices in your own woods (by you, a trained crew or both), you will start to achieve the full production potential you dream of.

Please join us by sending your \$30 payment to the new Walnut Council International headquarters office: Attention: Liz Jackson, Executive Director, John S. Wright Forestry Center, Purdue University Dept. of Forestry, 1011 N. 725 W, West Lafayette IN 47906-9431. Telephone: (765) 583-3501. You may also visit our website at www.walnutcouncil.org and join online.

Thanks, and I look forward to seeing you at the May 7th field day! (See calendar on last page for details).

Urban Tree Planting Tips (cont. from page 3)

“weed-free” zone around your new tree as wide as is acceptable to you. Once the competition has been removed keep it in check by mulching the area. Mulch should be no deeper than 2-4” and should be tapered so that it is less than 1” deep next to the trunk.

SECURE THE TREE. For container-grown and B& B trees staking is recommended if the tree is located in an area exposed to strong winds. However, secure the tree no higher than one-third of its height from the ground so that the top of the trunk can sway in the wind. To prevent injury to the tree trunk use rubber hose or specialty fabric straps to attach the tree to the supports.

WATER, BUT NOT TOO MUCH. The single most important survival factor of newly planted trees is soil moisture during the first few months after planting. It is equally important to keep in

mind that over-watering new trees during hot conditions can kill them almost as quickly as a lack of water.

An effective way to deliver water is drip irrigation. The simplest method is to take a 5-gallon plastic bucket, drill 1/8-inch diameter holes in the sides near the bottom, and place the bucket next to the tree. This allows water to slowly trickle into the root zone. To estimate how much water to irrigate with, calculate the volume of the root zone in cubic feet and add about 2 gallons per cubic foot. For example, a tree bought in a 5-gallon container will have a volume of 1/2 cubic foot. So, unless it rains the tree should receive about one gallon of water three times per week.

Keeping these points in mind will help ensure that the time and money you invest today will pay off in many restful naps under the shade of tomorrow’s tree.

Landowner Spotlight: Farmer perfects deer-proof fence

This article is part of a Missouri Department of Agriculture (MDA) series called “Small Farms, Big Ideas” that showcases Missouri producers who are trying innovative and sustainable projects on their farms.



The grant that assisted the Brundages in establishing their windbreak is part of the MDA’s Missouri Sustainable Agriculture Demonstration Awards program. In 2004, UMCA sponsored three of the program’s grants to focus on sustainable projects that involve agroforestry.

For Sustainable Agriculture Demonstration Awards program information, contact the MDA at (573) 522-8616. Visit www.mda.mo.gov to access additional “Small Farms, Big Ideas” stories.

Writer: Lori Compas (608) 238-1654 or lori@hartcreek.com

COLUMBIA, Mo. -- “If you’re growing trees, your No. 1 problem is going to be deer predation,” says Scott Brundage. Browsing and buck rubbing can destroy branches and buds, ruining a tree’s form and damaging its health.

Brundage, who has planted 55 acres of trees on a 76-acre farm in young walnut trees and ornamentals, thinks he’s found an inexpensive solution: a deer-proof fence. He won an agroforestry grant, part of the Missouri Sustainable Agriculture Demonstration Awards program, to build the fence and record its effectiveness.

The fence consists of two closely spaced electric wire-rope fence-lines, one around the perimeter of his field and the other three feet inside. The outer fence is strung with two rows of electric wire rope. One row is about 15 inches high and the other is about three feet off the ground. The second fenceline is about three feet inside the first, and it has three lines of wire rope: one at 12 inches, one at 28 inches, and one at 45 inches.

The fence is powered by a solar panel that charges a deep-cycle marine battery, and simple fiberglass poles support the wire ropes.

“The braided wire rope creates a kind of optical illusion,” Brundage says. “You almost can’t tell which is the front and which is

the back. In reality, the deer could jump over it easily – but they don’t.”

Brundage baits the top outer wire about every 100 feet. He uses a pop-top bottle cap and a cotton ball soaked in bait. “Concentrated apple juice works, but it’s very expensive,” he says. “Peanut butter works, and I hear molasses does, too. The idea is to use something sweet-smelling.”

Brundage says it works like a charm.

“That first night the sun goes down, and the deer come out,” Brundage says. “They’re very curious, and they’ll sniff that bait with their wet nose or lick it with their wet tongue, and let me tell you, that cannot be fun.”

He says the fence, when properly maintained, is 100 percent effective. As he sees it, there are two crucial keys to success.



Scott Brundage planted 55 acres of walnut trees and ornamentals on a 76-acre farm. With support from the Missouri Sustainable Agriculture Demonstration Awards program, he designed an electric fence that is effectively protecting the trees from deer predation.

First of all, the fence should be hot the first night it’s up, and it should be kept hot. This requires regular checking and maintenance.

“Weeds grow up and short it out, or reduce the power,” he says. “If you’ve got good weed control, you’re 90 percent home free.” He goes out three times a year – in late April, late June, and in August – and sprays pre-and post-emergent herbicides to control weeds.

He also advises checking the fence after a storm to make sure floodwaters or fallen tree limbs have not caused it to short out.

The other key is to bait the fence regularly. “The deer population is shuffling all the time, and the new ones have to be educated,” Brundage says. “Otherwise they’ll discover they can get through the fence, and then you have a problem.”

Brundage advises hanging fresh bait every two to four weeks.

The fence is easy to install and relatively inexpensive. Brundage says that he and two other people put up over a mile of fence easily in one day. (cont. page 11)

Management Practices to Enhance Bobwhite Quail Habitat (cont. from pg 6)

- **Missouri Bobwhite Quail Habitat Appraisal Guide**, produced by the University of Missouri Extension. The guide may be obtained through local MU Extension offices, or online at: <http://muextension.missouri.edu/explorepdf/miscpubs/mp0902.pdf>.
- A second guide is the **Habitat Appraisal Guide for Bobwhite Quail**, published by the Oklahoma Cooperative Extension Service. It is available online at: [http://www.talltimbers.org/images/pdfs/e-904 Quail Habitat Appraisal.pdf](http://www.talltimbers.org/images/pdfs/e-904%20Quail%20Habitat%20Appraisal.pdf).

Reducing the Cost

In the fall of 2004, President Bush announced the Conservation Reserve Program Northern Bobwhite Quail Habitat Initiative, designed to help bobwhite quail recover from a dramatic population decline. The goal of this program is to create 250,000 acres of habitat for northern bobwhite quail by enhancing early successional grass buffers adjacent to agricultural field borders. Included in the Bobwhite Buffer Program are a variety of native warm-season grasses, legumes, wildflowers, forbs, and a limited emphasis on shrub plantings. Contact your local Conservation Agency or Farm Service Agency to identify if your land qualifies for the program. Landowners should apply for Conservation Practice 33 (CP33), Habitat Buffers for Upland Birds. Enrollment is targeted to 35 States in the Midwest and Southeast; it is here that habitat improvements have the greatest chance to help bobwhite quail populations rebound. For more information, visit www.fsa.usda.gov.

Cost-Sharing Programs

An additional source of information on various cost-sharing programs that can reduce the establishment and maintenance cost associated with agroforestry and other conservation plantings on the farm can be obtained at: <http://agebb.missouri.edu/umca/pubs/fundincent.pdf>; and <http://agebb.missouri.edu/umca/pubs/agrotaxcons.pdf>.

Lease Hunting

In addition to programs that

support creating and managing habitat for quail, landowners may also consider leasing their farm ground for hunting. With the shortage of quality quail hunting land, sportsmen are willing to pay for the privilege of hunting where coveys are abundant. For more on lease hunting, and considerations that you the landowner should be aware of prior to allowing individuals to hunt on your land, visit the following online resources:

Lease Hunting Information:

- "Lease Hunting: Opportunities for Missouri Landowners" is a pdf guide available on the MU Extension web site at: <http://muextension.missouri.edu/explorepdf/agguides/wildlife/G09420.pdf>
- Several guides and additional information are available from Kansas State University Research & Extension at: www.agmanager.info. Select the links to Farm Management, then Land and Leasing, then Leasing.
- The University of Tennessee Extension program offers lease hunting information. Go to www.utextension.utk.edu/ and select Publications, then Wildlife and Fisheries to see a listing of lease hunting guides.

Additional Readings of Interest:

Dailey, Tom and T. Hutton. 2003. On the edge: A guide to managing land for bobwhite quail. The Missouri Department of Conservation. Jefferson City, Missouri. www.mdc.state.mo.us/documents/landown/wild/quail/quail_guide.pdf

Dimmick, R.W., M.J. Gudlin, and D.F. McKenzie. 2002. The northern bobwhite conservation initiative. Miscellaneous publication of the Southeastern Association of Fish and Wildlife Agencies, South Carolina. 96 pp.

Guthery, F.S. 2002. The technology of bobwhite management: the theory behind the practice. Iowa State Press: www.iowastatepress.com.

Guthery, F.S. 2000. On bobwhites. College Station: Texas A&M University Press.

Additional Online Resources:

www.mdc.mo.gov/landown/wild/quail

www.talltimbers.org/research/gamebird.htm

msucare.com/pubs/publications/p2087.htm

www.wildlifemanagement.info/birds.htm#quail

<http://teamquail.tamu.edu/links.htm>



Bioterraces, left, and riparian forest buffers can provide excellent habitat for bobwhite quail.



Southwest Center Research Farm Site of Premier Black Cohosh Study

by Rachel McCoy, UMCA



Medicinal herbs hold significant potential as profit sources for Missouri landowners pursuing production through the agroforestry practices of forest farming or alley cropping. Ginseng, goldenseal or black cohosh, for example, can be planted in between rows of pecan or black walnut trees in an alley cropping setting, or established within a wooded area in a forest farming practice.

One of the nation's most comprehensive research studies on the herb black cohosh is being conducted at the University of

Missouri's Southwest Research Center, Mt. Vernon, Mo. Located in the Ozark region of the state, the farm is an ideal setting for the cultivation and study of this native species, a project coordinated by University of Missouri Center for Agroforestry collaborator Andrew Thomas. The herb black cohosh, or *Actaea racemosa* (formerly named *Cimicifuga racemosa*), is native to North America, and its roots and rhizomes are widely used in the treatment of menopausal symptoms.

"Black cohosh is one of the top five medicinal herbs grown in North America and used in Europe, and the species is being ravaged by poachers and trespassers," said Thomas. "This overharvesting of naturally occurring black cohosh is threatening the species. We're one of the few institutions studying the cultivation of this plant in an effort to increase profit potential for landowners and to prevent devastation to the crop by poaching."

Found naturally in parts of Missouri and more abundantly throughout the Appalachian region, the root of the black cohosh plant is harvested and sold in health and specialty food stores as a remedy to menopausal symptoms. The export market overseas is the primary market for the herb, with 95% of the black cohosh harvested in North America exported to Europe, where it is prescribed by doctors.

"People are underestimating the cash value of the black cohosh industry," says Thomas. "It has powerful potential, and current and future research will continue to solidify this assumption."

Black cohosh has been medically proven as an effective aid to menopausal women, and is continuing to increase in demand, due in part to recent medical studies to explore possible harmful side effects for the heart with traditional chemical hormone replacement therapy. One of the experiments at the Southwest Center is

to expand outward from root harvesting and evaluate the potential of the natural medicinal compounds found within other tissues of the plant. This tissue research, combined with cultivation studies, places UMCA on the forefront of medical herb studies.

"Our research indicates there may be as much as two to three times more of certain medicinal compounds in the leaf of the black cohosh plant as is found in the root, and 50 times the amount of compound in the flower than the root," said Thomas.



A healthy black cohosh ribozome.

"Not only could these compounds bring a higher price than the root, but harvesting the leaves or flower means the plant is not removed from the ground and can continue to grow."

Thomas began the cultivation project in 1999 and

is working with nine different experiments at the Southwest Center, including cultivation in a shade house and a forest farming setting. He calls the herb "fairly simple to grow," and said it requires good drainage to prevent disease and rotting of the fleshy, thick root.



Black cohosh flowering under shade structure at the Southwest Research Center, Mt. Vernon, Mo.

Retail market prices for black cohosh in pill form are \$9-\$11 per 60-tablet bottle.

The supplement is also sold in tea and dried raw form at health and specialty food stores.

Similar to ginseng cultivation, black cohosh typically must be at least three years old to harvest the root and plant. One of Thomas' research projects involves testing the chemical compound of the plant to determine if a significant amount of medicinal



Black cohosh is sold in pill, root, tea or liquid form at retail health food and specialty food stores. Photo: Clovers Natural Market, Columbia, Mo.

compound can be harvested by growing the plant as an annual. The outcome may be the ability to plant black cohosh in the fall and harvest it the following year.

In addition to collaboration with the Center for Agroforestry, black cohosh

research at the Southwest Center is also supported by the Center for Phytonutrient and Phytochemical Studies, a consortium between the University of Missouri and (cont. next page)

Black Cohosh cont.

the Missouri Botanical Garden.

“There are still so many unanswered questions about cultivating this herb,” Thomas says, “but that’s part of the fun of doing the work and the research.”

For more information about black cohosh research at the University of Missouri Southwest Research Center, Mt. Vernon, Mo. visit <http://aes.missouri.edu/swcenter/fieldday/report.stm>, Horticulture Research section.

To learn more about forest farming practices and the value-added crops that can be produced through them, visit www.centerforagroforestry.org and select Profit in Agroforestry. Andrew Thomas’ published research papers on black cohosh will be available from this site soon.

Forestry Fact:

The traditional American woodframe home contains more than 13,000 board feet of wood products.

Farmer Perfects Deer-Proof fence (cont. from page 8)

Brundage has planted genetically superior grafted walnut trees about 60 feet apart over the 55-acre plot. Between the trees, on six-foot spacing, he has planted ornamental trees – oaks, maples, pears, and other “growing stock” that will be balled and burlapped for landscaping when the trees are six to ten feet tall.

On the 60-foot swath between rows, Brundage is growing a variety of field crops. This year he grew soybeans, and next year he plans to plant sunflowers and host a dove hunting rental area. He’ll also experiment with alfalfa for hay and valuable grass for seed.

As the farm changes, the fence can change right along with it.

“That fence can be moved from one field to another, or it’s easy to expand,” he says, noting that he’ll probably move the fence in about ten years, when the walnut trees are tall enough to withstand occasional buck rubs and the ornamental trees have all been dug up and sold to nurseries.

“If you manage it right, you can really do yourself some good,” he says.

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Announcing ...

A new and improved Center for
Agroforestry web site coming soon!

Learn more about agroforestry practices, the Center’s research initiatives and profit potential for agroforestry practices at the new site, coming in April.

The web address stays the same:
www.centerforagroforestry.org

Visit us online soon!

We want to hear from you!

Send newsletter information by the 15th of the month preceding publication to: Rachel McCoy, 203 ABNR, University of Missouri, Columbia, MO., 65211.

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Calendar of Events

May 7, 2005: Missouri Chapter Walnut Council Spring Meeting, Solomon Christmas Tree Farm (Fayette, Mo., area)

The meeting will show landowners how to manage their woodlands and plantations to produce high quality veneer logs and high grade lumber logs. The morning session will be in the hardwood stands located adjacent to one of Missouri's largest Christmas Tree Farms, owned by Clell and Marilyn Solomon. The afternoon session will feature one of the state's best examples of an intensively managed black walnut stand. For registration information and additional directions, contact Scott Brundage at (573) 443-3977; or email brundage@socket.net

June 12-15, 2005: Ninth North American Agroforestry Conference of the Association for Temperate Agroforestry (AFTA), Rochester, Minn. The three-day meeting, entitled Moving Agroforestry into the Mainstream, will include sessions on agroforestry practices, environmental services and watershed management. Economics, markets, and profitability for agroforestry and policy issues affecting agroforestry will also be featured. For more information, visit www.aftaweb.org.

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/>