

GREEN HORIZONS

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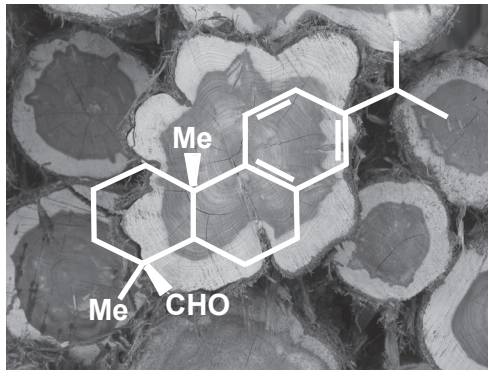
Growing Tomorrow's Future Today

Spring 2008

Redcedar: From Invasion to Innovation

Michelle Hall, MU Center for Agroforestry

Eastern redcedar is the most widely distributed tree-sized conifer in the eastern United States, although its many industrial uses are not widely known and it is considered an invasive weed tree in many regions of the country. But new research at the University of Missouri Center for Agroforestry could help redcedar go from “trash to cash” for landowners.



Chemical structure of antibacterial compound found in redcedar.

Chung-Ho Lin, research assistant professor of forestry with the Center for Agroforestry, has found redcedar leaves and fruit to have compounds that may help to fight bacteria, fungi, agricultural pests and weeds, malaria, and the production of melanin, which can help skin have a more youthful appearance and even prevent skin cancer.

Lin said he has spoken with landowners who have acres and acres of redcedar but no idea what to do with it. He is working to change that common problem.

“This could provide an incentive for people to leave these trees on their land, where they can be beneficial to the environment, by preventing stream bank erosion, for

example.” Lin said. “Since redcedar spreads so rapidly, landowners can cut their trees for the wood, leaves and fruit without concern about the future of the species.”

Lin and students Mark Hymbaugh, MU senior in biochemistry, and Amber Spohn, senior in environmental geology, studied the fruit, leaves, branches, roots, sawdust, oil, resin and bark of the (cont. pg. 10)

Forest from the Trees: A Missouri Tree Farm is Born

Dave Murphy, Missouri Conservation Federation

Our 376-acre farm in Northeast Missouri has 240 acres of forest. It's a sizeable tract for Clark County, but a miniscule part of Missouri's 14-plus million acres of forest. I am always amazed by the fact that although most of Missouri's forest is in private ownership, a mere 5 percent or so is under planned management.

One reason for this may be that we have more than 350,000 forest landowners in Missouri. Doing the math works out to less than 50 acres of forest per landowner. Not what most of us would (cont. pg. 8)

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'Tree Tags' Translate Woody Benefits into Real Dollars

Angela Schreffler, Heartland Tree Alliance; Helene Miller, Missouri Department of Conservation; and Stephanie Williams, Mid-America Regional Council

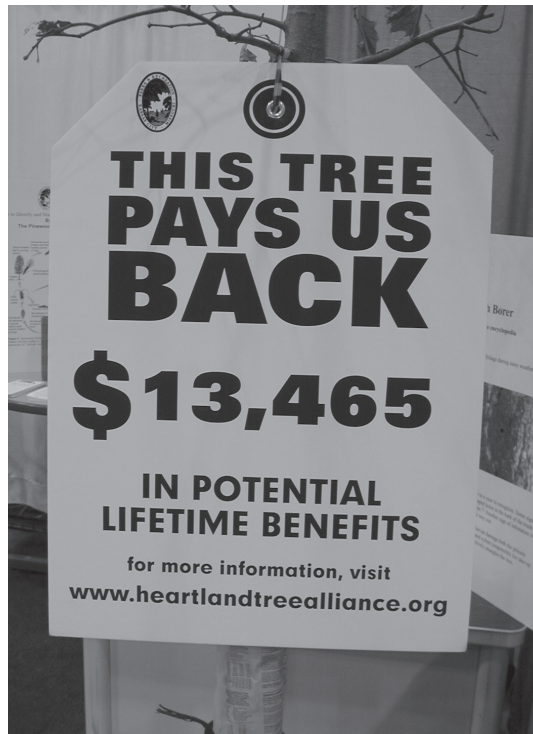
How much is a single tree worth to a community? In some cases, more than \$70,000, local experts say.

In honor of Arbor Day, "tree tags," price tags that quantify in dollars the benefits of trees, temporarily adorned some of Greater Kansas City's trees. One hundred tags were placed around the Greater Kansas City metro area as communities celebrated Arbor Day. Missouri's Arbor Day was April 4; Kansas' Arbor Day was April 25.

The purpose of the tree price tag project was to make people aware of the many benefits that trees provide to cities in terms of stormwater reduction, improved air quality, higher real estate values (and property tax receipts), carbon storage, and energy savings. The tree tags show a dollar value for the services provided by that tree over its projected lifetime. While trees are beautiful, they are also a vital part of the metro's infrastructure, providing many benefits. They need maintenance and care. This is not a nice extra in city budgets; it is vital maintenance that actually saves cities money in the long run. Trees don't cost us money – trees pay us back many times over.

The dollar amounts attached to each tree were based on its estimated returns to the community, including reducing stormwater runoff, improving air quality, raising real estate values and more. The amounts were calculated by the unique life span, species and condition of each tree. Some of the heftier price tags include burr oaks in several locations across the region that will provide benefits worth well over \$50,000 per tree. The majority of the values ranged from \$1,000 to \$30,000.

Tall-growing shade trees such as oaks, maples, ginkgo, baldcypress and others provide many more benefits than short growing trees such as the crabapples, pears and redbuds. This is for two reasons: the taller trees have



more impact on the environment with more shade, more carbon stored, and more leaf and root area to hold stormwater. The shade trees also tend to live much longer than smaller trees – 70-200+ years when cared for vs. 30 years for the smaller trees.

The tags were installed in Kansas City, Mo.; Gladstone, Mo.; Liberty, Mo.; Overland Park, Kan.; Westwood, Kan.; Olathe, Kan.; Mission, Kan.; and Wyandotte County, Kan. More information, along with a complete list of where the tags can be found, is available online at www.heartlandtreealliance.org

Here's more information about the value of the trees in the Kansas City metro area:

- The city of Kansas City, Missouri's 415,000 trees inventoried return \$51 million in benefits annually to the city, which is \$123 per tree per year.
- The city of Westwood's 1,915 trees inventoried return \$274,410 in benefits annually to the city, which is \$143 per tree per year.
- The city of Liberty, Missouri's 741 trees inventoried return \$52,374 in benefits annually to the city, which is \$70 per tree per year. Liberty's tree value is lower than other cities because many of the trees were damaged by a tornado.
- The city of North Kansas City's 1,808 trees inventoried return \$345,441 in benefits annually to the city, which is \$191 per tree per year.

Coordinating partners of the effort include the Mid-America Regional Council, Heartland Tree Alliance, Kansas Forest Service, Missouri Department of Conservation and Arborist Bob Haines. **GH**

Additional information on the benefits of trees can be found at: TreeLink: www.treelink.org; Louisiana Public Broadcasting: www.lpb.org/programs/forest/chicago.html; National Arbor Day Foundation: www.arborday.org

Show Me Energy Can ‘Show’ Wood-to-Energy Projects the Way

Hank Stelzer, MU Forestry Extension (quotes from ‘Co-op turns feedstock into energy’ by Mindy Ward, Missouri Farmer Today)

Various communities in Missouri are beginning to explore wood-to-energy projects. While wood chips will play a small part in Show Me Energy’s cellulosic energy game plan, the company’s holistic, community- and producer-based strategy serves as a good model for forest-based energy projects.

Show Me Energy Cooperative began as little more than an idea in the mind of Steve Flick. As a seed company owner, (Flick Seed of Kingsville, Mo.) Steve was concerned about the amount of grass seed hulls he was forced to dispose of on an annual basis.

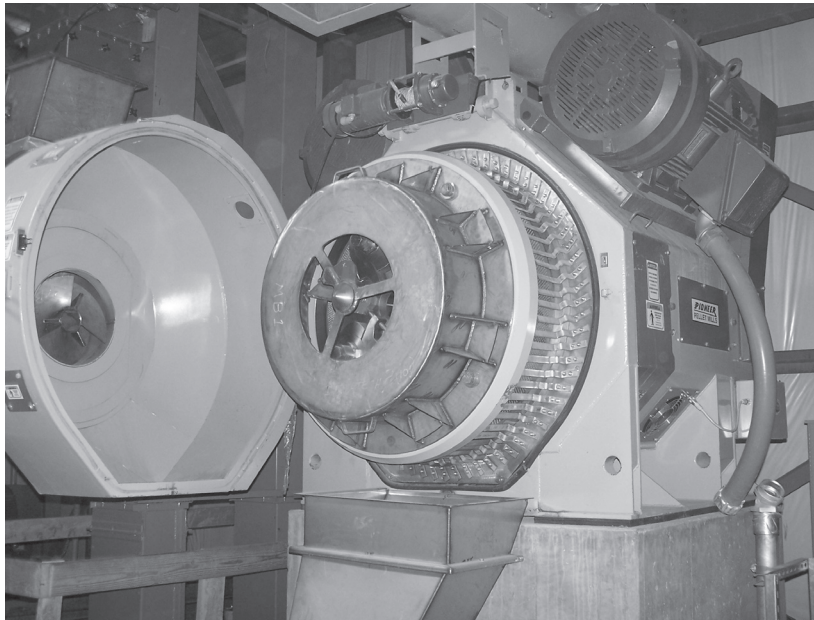
In his case, disposal meant burying, burning, adding them to a sanitary dump site, or simply distributing them over a landscaped area. Each solution had its particular costs and negative aspects. Steve began to wonder if there might not be a better solution that would actually turn his “residue” into some sort of viable product.

Steve’s vision was to establish an innovative and profitable model for production of biomass-based fuels which could be replicated across the country by small producer-owned cooperatives. These co-ops would provide a positive economic impact on the regions where they were located.

Show Me Energy is developing its Centerview, Mo., site in three phases.

The first phase, which is nearing completion, will convert cornstalks, grass straw, wheat and oat straw, milo

stubble and soybean stubble into pellets. These pellets will then be sold to Kansas City Power and Light where they will be co-fired with their current feedstock of coal for the production of electricity. It’s a win-win situation for both groups. Kansas City Power and Light earns Renewable Energy Credits (RECs) from the EPA for burning a renewable resource and Show Me Energy has a ready buyer for its pellets.



One of two mills that will produce four tons of pellets each hour from crop and grass residues. Kansas City Power and Light will co-fire these pellets with coal to help reduce the power plant’s greenhouse gas emissions.

Phase Two will be a gasifier to convert cellulose into ethanol. A European modulated cellulosic fuel model, the plant will generate roughly six to eight million gallons of ethanol per year. “It is small, but we can grow with it.” The gasifier model is more versatile because it allows for more source variety. “We can take in 17 different kinds of input,” Flick says. “We are not just married to a grain-based system.”

The final phase will be producing electricity from by-products of the gasification process. “What we

will do is take the hydrogen by-products and scrub it, pressurize it and generate about 12 megawatts of electricity; enough to run the plant and sell the excess,” he adds. Utility plants have expressed interest in purchasing the green energy.

Co-op members lie within a 22-county area that includes Show Me Energy’s home county of Jackson. Wanting to appeal to the average farmer, the group had a modest entry fee. Membership requirements were \$2,500 per share with a two-share minimum. Much like grain ethanol plants, members have the right to sell the product to the plant. He says what “sold the cooperative” was the project brought small farmers and large farmers together in unified effort. “We made it so (cont. pg. 9)

Online Tool Available for Identifying and Selecting Black Walnut Cultivars

Michele R. Warmund and Mark V. Coggeshall, MU Division of Plant Sciences and Center for Agroforestry

Black walnuts (*Juglans nigra* L.) are valued for their uniquely fruity flavor and are often used as an ingredient in baked goods and ice cream or are eaten as a snack food. Although black walnuts can be harvested from wild trees, several cultivars have been selected for such characteristics as ease of cracking, size of kernel and thickness of husks and shells. Other characteristics, such as date of budbreak, time of flowering, length of season and date of harvest, are also important as there is considerable variation within the species.



confirmed by “DNA fingerprinting.” Cultivars maintained in the repository are used in a breeding program focusing on nut improvement.

This information is now available online (<http://extension.missouri.edu/explore/miscpubs/xm1001.htm>) to help walnut growers identify walnut cultivars by the appearance of the husk, shell and kernel and to select

The University of Missouri Horticulture and Agroforestry Research Center (New Franklin, Mo.) maintains a repository of more than 40 named cultivars of black walnut valued for their kernels (rather than timber). The identities of each of these cultivars have been

cultivars on the basis of various growth characteristics. In addition to a photo gallery of black walnuts, the Web site lists the average date of budbreak, flower type, bloom period, pollination date, season length and harvest date for more than 40 black walnut cultivars. Data were collected over a four-year period, from 2002 to 2006, at New Franklin, Mo.; dates reflect the growing season in central Missouri and should be adjusted for other regions. **GH**

The Bid Box

(All volumes reported in Doyle Scale)

Bollinger County

- 52 acres
- 442 mixed hardwoods (mostly white oak, black oak, yellow poplar, and hickory, etc.)
- Estimated volume: 89,181 bd.ft.
- Forester valued the sale at \$29,000
- 7 bids
 - o \$35,255
 - o \$34,125
 - o \$27,300
 - o \$27,261
 - o \$25,300
 - o \$23,150
 - o \$23,000
- **Return: \$678 per acre**

Bollinger County

- 70 acres
- 463 mixed hardwoods (mostly black oak, white oak and yellow poplar)
- Estimated volume: 88,528 bd.ft.
- Forester valued the sale at \$25,500
- 3 bids
 - o \$27,550
 - o \$20,765
 - o \$20,017
- **Return: \$394 per acre**

Do You Have a Timber Sale for The Bid Box?

If you have competitively sold your timber in the past few months and would like to share the information with other landowners, we would welcome your input. All sales will be reported at the county level as shown above and no personal information will be divulged.

Preserving the Family Forest: A Request from the Authors

It has been a year now since David and I have been writing a series of articles on estate planning for the woodland owner entitled “Preserving the Family Forest.” We hope that these articles have been informative for you and your families.

We have covered general topics such as:

- *Developing a vision statement to help guide complex and difficult decisions.*
- *Deciding which specialists you need when designing an estate plan to ensure your wishes and desires are in place when it comes time to pass the forest on to your heirs.*
- *Communicating with your heirs on your desires for the property at your death.*
- *Introducing your estate team to the heirs.*

Each of these topics has been written as purely hypothetical and general in nature.

While these articles may be interesting and informative, we feel GH readers would be able to relate better to real

live examples of estate plans in progress. For that reason, we are soliciting volunteer woodland owners that recognize they have a need to plan for the transfer of their forest and estate in a tax efficient manner and according to their wishes. It’s not every day you can get the professional services of a Certified Financial Planner or Chartered Financial Consultant/Chartered Life Underwriter on an estate plan at no cost.

Confidentiality will be maintained at all times and any study appearing in GH will simply be referred to as Case Study #1, 2, 3, etc. If you wish to participate, please contact either Kirk or David at their respective address below:

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You can also speak with Hank, Kirk or David at the re-scheduled Woodland Owners Conference in June. **GH**

MOWOC Rescheduled for June

The bad news is that the weather didn’t cooperate the first time around. The good news is that you didn’t miss the 2008 Missouri Woodland Owners Conference, or MOWOC. Yes, the conference has been rescheduled, from Feb. 22-23, to June 20-21, 2008, at the Marriott Courtyard Hotel here in Columbia.

Registration for the Saturday conference is \$50 per person and \$90 with spouse/guest. Registration for the Friday Field Day is an additional \$15 per person and will be limited to the first 125 individuals who sign up.

A special conference rate of \$79 (plus tax) is available at the Marriott Courtyard; reserve your room by calling (573) 443-8000 before June 1 to guarantee accommodations.

You can register for the conference online at <http://moforest.org> or by calling Glenda at (573) 634-3252. Those who registered before the February date should have received a letter. **GH**

Ties to the Land: Online Tool to Help Preserve Family Forest

Millions of acres of family-owned forest land will change hands in the U.S. within the next decade. Most of these transfers will happen with virtually no planning. That is why we asked David and Kirk to help us help you.

Oregon State University has developed a program, “Ties to the Land,” so successful it is now available nationwide. Go to <http://www.familybusinessonline.org/resources/> and click on “Ties to the Land: Your Family Forest Heritage.” **GH**

The Carbon Corner: Managed Forest Carbon Projects

Hank Stelzer, MU Forestry Extension

Editors' Note: Since our first article on carbon credits, we have come to realize that this is a rapidly evolving and ever-changing opportunity for forestland owners. While we realize that some question the ecological value of carbon trading, our intent is one of providing the latest information so our readers can make informed decisions. With this in mind, the "Carbon Corner" has become a regular feature. We welcome specific questions from landowners wishing to learn more about becoming players in this emerging market.



This past December, the Chicago Climate Exchange (CCX) formally released procedures for enrolling managed forests in the Exchange's "Managed Forest Carbon Project." As with any new program, while "formal" procedures have been established, the interpretation of those procedures remains a work in progress. Also, anyone who has ever written rules for anything knows that exceptions and special cases invariably crop up, sometimes even before the ink dries! This is especially true with managed forest carbon projects.

So why bother GH readers at this point in time with something that is still evolving?

Well, because these projects are signed contracts and aggregators are beginning to solicit participation in this carbon offset, we want to make sure that forest landowners (1) are aware of the opportunity, (2) knowledgeable of the procedures, and (3) understand the responsibilities of all parties before they sign on the dotted line.

So, not to favor any one aggregator, here is some information straight from the CCX Web site (see link at end of article) regarding managed forest carbon projects. As the dust settles, we will provide GH readers with procedural clarifications, examples of approved projects and any payouts to landowners as they become available.

What is a CCX Managed Forest Carbon Project?

This project type employs active forest management including silvicultural treatments, thinning and harvesting. Under the managed forest offsets program, eligible projects may earn offsets for the net annual carbon sequestered from growth in registered forest stocks.

What forest carbon pools are eligible for crediting under the managed forest program and how are forest carbon stocks quantified?

The protocol allows offset issuance for above ground biomass and below ground biomass portions of the registered forest carbon pool. In order for offsets to be issued, net growth in forest carbon stocks must be quantified using a CCX approved quantification technique. These techniques include use of approved biophysical growth and yield modeling techniques.

What is the role of the CCX Committee on Forestry?

The CCX Forestry Committee, comprised of forestry experts from the CCX Membership, is responsible for reviewing forest offset project proposals and recommending approval. The Committee is also responsible for recommending interpretations of rules relating to quantification of forest carbon stocks, as well as recommending additional methods to be employed to quantify and verify changes in forest carbon stocks. All managed forest project proposals must be submitted to the CCX Forestry Committee for approval. Project proposals should provide pertinent information regarding project design and inventory, sampling, forest management and quantification techniques.

How do project participants demonstrate long-term commitment to maintain enrolled land under forestry?

Project participants must sign a contract attesting that the land will be maintained as forest for at least 15 years from the date of enrollment in CCX. In addition, all participants are required to sign a letter of good faith stating that they will maintain enrolled land in forest beyond the 15 year contract period required by the program. A sample copy of this letter may be requested from CCX.

(cont. pg. 7)

Carbon Corner, (cont. from page 6)

What evidence of sustainable forest management is required?

Project participants must provide evidence that all of the registered forest land is sustainably managed through certification from agencies or schemes endorsed by the Programme for the Endorsement of Forest Certification schemes (PEFC) Council or through other certification schemes that have been approved by the CCX. Approved certification schemes for the United States include Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI) and American Tree Farm System Group Certification.

How do CCX rules address the loss of carbon due to catastrophic events such as hurricanes or forest fire?

All CCX eligible soil and forestry offset projects are required to maintain a carbon reserve pool to manage risks including losses from catastrophic events. Twenty percent of the CCX CFI contracts generated annually by the project will be placed in the reserve pool. A forest carbon reserve pool is established for each pool registered by an aggregator or individual projects from offset providers. At the end of the CCX market period, CCX CFI contracts remaining in the forest reserve pool will be released back to the participants. The maximum catastrophic loss recognized by CCX will be no greater than the amount of offsets in the reserve pool at the time of annual environmental compliance.

Can I acquire and enroll new forest land in the project or dispose of enrolled land from the project?

CCX forestry program rules are structured so as not to restrict participants from land acquisition or disposition. On an annual basis, the quantification of changes in forest carbon stocks will be adjusted to reflect acquisitions or dispositions. When eligible new land is acquired, the project owner may be eligible for issuance of CCX CFI contracts corresponding to sequestration in the new enrolled acres. When enrolled land is disposed, the total CCX CFI contracts issued from that parcel of land has to be surrendered back to CCX. Under certain circumstances when land disposed by one project participant continues to remain enrolled in the CCX program, surrender of CCX CFI contracts from previous years may be warranted.

What is an Offset Aggregator?

An Offset Aggregator is a CCX-registered entity that

serves as an administrative and trading representative on behalf of multiple project owners. Individual projects which may not generate enough offsets to overcome administrative costs may find it advantageous to work with an Aggregator in bringing a project to CCX. Aggregators are responsible for interacting with CCX, explaining CCX rules and requirements to project owners and coordinating with CCX approved verifiers. In addition, Aggregators are responsible for trading activities and the maintenance of the Registry Account. Individual landowners are encouraged to contact Aggregators directly, as the contracts are signed directly between those parties. Aggregators, with links to their respective Web sites, are listed on the CCX Web site at: www.theccx.com/content.jsf?id=64

What are the verification requirements?

Managed forest projects require an annual verification through a CCX-approved forestry verification firm. The annual verification process aims at verifying the validity of the forest carbon stock baselines including baseline adjustments, validity of the database, accuracy of data collection, applicability, correct use of forest carbon quantification techniques employed and accuracy of carbon calculations. The costs for the verification are borne by the registered CCX Offset Provider or Aggregator. A complete list of approved verifiers is available on the web at: www.chicagoclimateexchange.com/content.jsf?id=102 **GH**

www.chicagoclimateexchange.com

Specific Activity in Missouri

Tatanka Resources, LLC (a registered CCX aggregator) has finalized composition of their pool of aggregated small forestry project landowners. Winrock International (an approved CCX verifier) is currently finishing the stratification and sampling design and they will be sampling 10 percent of all acres in the pool, including taking samples to estimate soil carbon sequestration. It is expected that Winrock will be taking field samples in May and the sale of credits will occur shortly thereafter.

Forest from the Trees (cont. from front page)

consider “worth fooling with” as an enterprise, I suppose. There is also the consideration that some folks think anything to do with forest management won’t pay or that harvesting timber is bad.

It further appears to me that many folks simply are not aware that options exist and are readily available to landowners in Missouri who want to better manage their forests.

To my family and me, this farm is a very, very special place. It was my grandfather’s farm. My dad was raised there. It is where we learned to hunt. For generations, this land has provided fuel for heating, lumber for building, game for food and recreation, a garden for family food, and agricultural crops for income. With the passing of my grandparents, dad wound up with responsibility for this farm as well as the farm he and mom own and operate. Eventually, desires of our extended family required us to take action. My wife and I followed through with a long series of negotiations and transactions to buy the farm.

We are not a family of exceptional wealth, so owning the farm as a purely recreational property was not an option. We dove right into ownership, fully aware that responsible financial management of all parts of the farm was mandatory. Where to begin?

We began by seeking the best advice available to us. Such advice is available to all, by the way. We began with a complete inventory of the forest, which served as the foundation upon which our forest management plan is based. We hired consulting foresters to conduct the inventory, map the stands by soil type, aspect and species composition, and to draw up the management plan.

We decided on the objective of a productive, healthy and sustainable forest. We decided to emphasize both quality of timber production and abundance of wild turkeys as guiding considerations for the plan.

Amazingly to me, this inventory and plan development was accomplished in weeks, not months. The investment we made in planning has proven many times over to be our second best investment so far. Second best, that is, to buying the farm in the first place.

So we began with a plan. If you are about to buy land, you should do the same. If you already own forest, but have no formal plan, we encourage you to get one developed. If you are among that tiny minority who already own forest and have a plan...well, dust it off, re-read it and see how things are progressing. Any plan is only as effective as its implementation.

The estimates of the positive benefits of bringing more of Missouri’s forests under management are staggering. BILLIONS in revenue every year. THOUSANDS of additional jobs statewide. Our forest industry already pumps over \$4 billion each year into the Missouri economy.

Imagine the huge benefits of bringing best management practices to more of our forests. Imagine the increased food and cover available to wildlife. Imagine the improved quality and quantity of timber production. Imagine the enhanced protection of watersheds and water supplies. Imagine the benefits of protection from invasive plants, animals, diseases and insects. These are just a few of my reasons for bringing our forest under management...find your own and get a plan! **GH**

In the next issue... Even Before We Get Started

Editor’s Note: *Dave Murphy is the Executive Director of the Missouri Conservation Federation and in October 2007, he became a Tree Farmer. Dave has graciously allowed us to reprint a series of articles he is writing for the Federation’s bimonthly magazine, Missouri Wildlife, recounting why and how this came about.*

Did You Know?

Of the 7.4 billion hardwood trees that are presently growing in Missouri, 5.8 billion (78 percent) are less than five inches in diameter at breast height (4.5 feet above the ground). Too many small-diameter trees in our forests is like too many plants in your garden. Managed forests mean thinned forests!

Source: *Missouri’s forests 1999-2003 (Part A). 2007. USDA USFS Resource Bulletin NRS-10.*

Reader Survey Results

We wish to thank those readers who responded to the survey that appeared in the last issue of GH. As of this printing, here is what you have told us. If you did not return your survey and wish to do so, there is no deadline. We always welcome feedback. The survey will soon be posted on the Forestry Extension Web site (www.snr.missouri.edu/forestry/extension) for anyone wishing to put electrons to work instead of the Post Office.

Our readers overwhelmingly agree that we provide a good unbiased balance of agroforestry, community forestry and general forestry articles. And in spite of my most verbose attempts, most folks think our articles are the right length. You like the recurring features, such as “The Carbon Corner” and “Preserving the Family Forest”; especially well-liked is “The Bid Box.” We are extremely pleased that everyone agrees that each issue contains at least one piece of useful information that can be applied to the management of their woodland.

Looking ahead, our readers want to see more articles on determining the best strategies for managing various woodland scenarios. You want to know the characteristics of Missouri’s important forest tree species and how best to manage them, for timber as well as for wildlife purposes. Money does matter and people want information on evaluating the payout of various management practices as well as marketing tips, and woodland valuation and appraisals. You also want to be kept abreast of any state and federal forest policies that could affect you and how you manage your forest.

Two surprises at this juncture have been only the relatively ‘fair’ interest in carbon credits and estate planning. We believe that this will change, however, as more family forest landowners will come to see the close ties between removing unproductive, small-diameter trees from their woodland and managed forest carbon projects. Also, as more of our ‘experienced’ landowners pass their woodland legacy on to their heirs, the interest in planning for the future today should rise.

As we said at the start, if you haven’t provided your input, as Ed McMahon used to say, “Go ahead. Send it in!” We would love to hear from you. **GH**

Show Me Energy (cont. from page 3)

everybody could be involved.”

Every dollar invested equates to five pounds of biomass. So, a producer who invests \$5,000 has the right to sell 25,000 pounds of biomass or 25 big round bales of biomass to the plant.

Because biomass content varies, the co-op came up with three criteria for purchasing. “We buy based on moisture, Btu, and weight,” Flick explains. “That is the fairest way.”

“There is a tidal wave coming to this country,” Flick says. “It is going to hit us so fast, and we need to be ready.” He says the revolution coming to rural communities across the country will change today’s farming dynamics.

“They are now going to be farming for fuel benefits.” “If we can do it in the middle of the country, there is no reason why other communities throughout this country could not do it based on this model,” he adds.

Pellets, cellulosic ethanol and electricity from hydrogen will not settle all the problems when it comes to energy. But, it is a start. As Steve says, “It is our children’s and grandchildren’s future if we don’t do something about it now.”

Show Me Energy’s motto, “Creating Energy Today for America’s Tomorrows,” says it all. **GH**

Invasion to Innovation (cont. from pg. 1)

redcedar, to determine which parts might have beneficial compounds. They extracted compounds from each tree part and then tested these compounds on bacteria, fungi, weeds and melanin to see if growth was inhibited. Chemical compounds found in the leaves and fruit had the most promising results, although levels of activity varied. Now, the potent compounds in the extracts showing high bioactivities will be further isolated and purified for chemical characterization. Ninety-five percent purity is needed to confirm that the chemicals identified are useful for the pharmaceutical and cosmetic industries, Lin said.



Chung-Ho Lin, MU research assistant professor of forestry, works in the lab. Lin and student researchers have found promising compounds in the fruit and leaves of redcedar.

“Every chemical has a ‘fingerprint,’” Lin said. “We use the fingerprint of the unknown compound and compare it to known chemical fingerprints in an existing database.”

At least two antibacterial chemicals in the redcedar needles (leaves) have been isolated; these chemicals are similar to others that have proven effective against a wide range of bacteria. In addition, other chemicals have shown promising inhibitory effects on melanin development and tyrosinase activity. This means they have great potential for skin care application for preventing and healing pigmentation after sunburn, freckles, liver spots, etc. Best of all, this class of chemicals has been proven to be very safe for external skin application.

“Value-added phytochemical products from eastern redcedar have the potential to create new industries in regions such as Missouri with an abundant redcedar resource,” Lin said.

Mike Gold, professor and associate director of the Center for Agroforestry, said the goal of the Center is to help landowners around the state and country get the most

from their land. Through agroforestry practices such as riparian forest buffers, windbreaks, silvopasture, forest farming and alley cropping, landowners diversify products, markets and farm income; improve soil and water quality; and reduce erosion, non-point source pollution and damage due to flooding.

“The Center is interested in finding uses for redcedar, an abundant Missouri resource. These trees have been classified as a weed, yet are extremely common in this state. Looking to find pro-

ductive uses from the beneficial compounds in redcedar will help create additional markets for the trees, where none existed previously,” Gold said. **GH**

Outrider Herbicide Safe to Use in Hardwood Plantings

Outrider (active ingredient: 75 percent sulfosulfuron) is a systemic, water soluble granule that can control many annual and perennial weeds in native warm-season grass stands and hardwood plantings of black walnut, pecan, cottonwood, sycamore, burr oak, swamp white oak, pin oak, green ash, and baldcypress. It has both pre- and post-emergence activity.

Over-the-top applications of up to 1.33 ounces of product per acre can be made in **well established** (i.e. either greater than one-year old or where rains have allowed the soil to completely settle the ground around the seedling) plantings. The label allows for a second application, but there must be at least 21 days between each application.

PDF files of the product label and Material Safety Data Sheet (MSDS) are available online at www.cdms.net **GH**

The Back Page

Deadlines for Newsletter Submissions

Spring Issue: March 15
Summer Issue: June 15
Fall Issue: September 15
Winter Issue: December 15

Save the Date!

Take the opportunity to learn more about the development and adoption of agroforestry at the 11th North American Agroforestry Conference, hosted by the University of Missouri Center for Agroforestry and the Association for Temperate Agroforestry. The conference will be May 31-June 3, 2009 (yes, that's '09!), at the Stoney Creek Inn, Columbia, Mo. The conference will provide a forum for individuals associated with or practicing agroforestry to share their experiences and discuss production, environmental and social attributes of different agroforestry prac-

tices. There will be plenary and concurrent sessions, a poster session, field trips and time for discussion that focus on the successes, opportunities and constraints of agroforestry. Special emphasis will be placed on practical examples of agroforestry practices and on technology transfer to producers.

A great learning opportunity in our own backyard!

See www.centerforagroforestry.org for more information; the site will be updated frequently as additional information becomes available.

GH Online: Find Green Horizons on the Internet at <http://agebb.missouri.edu/agforest/index.htm> or <http://snr.missouri.edu/forestry/extension/>

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Calendar of Events

May 6, 2008: Tree Grafting Workshop, Southwest Research Center, Mt. Vernon, Mo. Instructors are Bill Reid, Kansas State University, and Andy Thomas, MU Southwest Center. Program begins at 1 p.m. and runs through 3 p.m. Bring along a sharp grafting knife or small flat-bladed knife, and sample branches of trees you'd like to graft. The workshop is free and open to all, regardless of grafting experience. RSVPs are not necessary, but if you are interested in learning to graft a particular species, let organizers know in advance by calling the Center at 417-466-2148.

June 20-21, 2008: Missouri Woodland Owners Conference (rescheduled date), Courtyard Marriott, Columbia, Mo. Horticulture and Agroforestry Research Center tour on Friday. See pg. 5 for additional information or contact Hank Stelzer at stelzerh@missouri.edu or 573-882-4444.

Aug. 3-7, 2008: Walnut Council Annual Meeting, Columbia, Mo. Details will be posted at www.walnutcouncil.org in May. For more information contact Liz Jackson at Jackson@purdue.edu or 765-583-3501; Jerry Van Sambeek at jvansambeek@fs.fed.us or 573-875-5341 ext. 233; or Mark Coggeshall at coggeshallm@missouri.edu or 573-884-1777.

Aug. 10-13, 2008: Northern Nut Growers Association Annual Meeting, College Station, Texas. Details posted at www.nutgrowing.org

Oct. 18, 2008: 6th Annual Missouri Chestnut Roast, University of Missouri Horticulture and Agroforestry Research Center, New Franklin, Mo. For more information, go to www.centerforagroforestry.org or contact Julie Rhoads at RhoadsJ@missouri.edu or 573-882-3234.