green horizons

Growing tomorrow's future today.

Spring 2019

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

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Editors:
Mike Gold, Hannah Hemmelgarn, Hank Stelzer

Scott Brundage Receives Slusher Tree Farm Service Award

Lynn Barnickol and Bob Ball

Scott Brundage, forester and Tree Farm Owner was awarded the John P. Slusher Tree Farm Service Award this year during the Missouri Tree Farm 70th Anniversary Celebration Conference. This award is made in remembrance of John P. Slusher, a forester and long-time University of Missouri Forestry Extension Specialist. The award is presented to Tree Farm members and non-members who have performed distinguished service to the Tree Farm Program at the regional, state, or national level. The accomplishments shall be consistent with the goals and objectives of the Tree Farm Program. As an example of his many accomplishments, Scott, in 1984, was one of the founders of the Missouri Consulting Foresters Association serving as its first vice president and later president. He continues to participate as the member with the longest service record.

Left to right: Rick Merritt, vice chair Missouri Tree Farm Committee, Scott Brundage, Scott's son Robert Brundage, and Hank Stelzer congratulate Scott Brundage at the Missouri Tree Farm 70th Anniversary Ceelebration Conference

Nominations for the Award may be made by any Tree Farm Committee members or individual Tree Farm members. The Tree Farm Committee reviews nominations and selects a recipient. No monetary gifts may be made, but expenses may be paid for the recipient to attend the Tree Farm annual meeting or other appropriate place of presentation.

Partners for Places: A Green Infrastructure Grant

Tom Ebeling, Forest ReLeaf of Missouri

In 2018 the City of St. Louis and several partners were awarded a grant by The Funders' Network for Smart Growth and Livable Communities. The goal of the grant was planting trees to manage stormwater, enhance tree canopy, reduce the urban heat island impact and strengthen community relations. The grant also helped to fund Forest ReLeaf of Missouri's Tree Tender community forestry youth employment pilot program. The grant partners included City of St. Louis Office of Sustainability, Department of Public Safety, Department of Parks, Recreation and Forestry, The Missouri Botanical Garden, St. Louis Youth Jobs and Forest ReLeaf of Missouri. While the Office of Sustainability secured the grant and assembled the team of partners, Forest ReLeaf served as the project coordinator once the grant was awarded.

In the spring and fall of 2018, planting projects took place in four city parks, where a total of 500 Missouri native trees and shrubs were planted. Besides increasing the urban canopy in high need areas, a goal of the projects was to build community ties by having citizens plant trees alongside first responders from the St. Louis Fire Department and Police Department. At all of the projects, police could be seen distributing water, picking up trash and chatting with people from the neighborhood while firefighters planted trees and generated attention with their trucks and safety demonstrations. In the spring, 50 trees were planted at the Minnie Wood Park and 100 trees were planted at Barrett Brothers Park.

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City of St.Louis Partners for Places: *Using Trees as Green Infrastructure for Economic, Social and Environmental Outcomes*

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In the fall, 100 trees were planted at Marquette Park and 250 trees were planted at Fairground Park. The planting project locations were selected based on 5 criteria: incidence of crime, youth density, park access needs, stormwater priority area, and tree canopy needs. The parks selected had high needs for all 5 criteria, which allowed the projects to have the largest possible impact.

In the summer of 2018, Forest ReLeaf of Missouri was also able to hire six St. Louis city youth for their Tree Tenders pilot program thanks to funding from the Places for People grant. The goal of the Tree Tenders program was to introduce youth from underserved areas to careers in urban forestry, conservation and the green industry while also caring for some of the planting projects funded by the Places for People Grant. The Missouri Botanical Garden was instrumental in helping Forest ReLeaf develop this new program. The Tree Tenders spent last summer maintaining the trees planted during the spring projects, conducting invasive species control, cleaning up parks and working closely with urban forestry professionals to learn about environmental stewardship and the green industry. In addition, they received some basic skills training from St. Louis Youth Jobs, such as personal finance and professionalism. The youth were supervised by a Forest ReLeaf intern, which served as a capstone project for a senior at MU majoring in urban forestry.

Forest ReLeaf also participates in the St. Louis Green Teen Alliance, which serves as a clearinghouse for data collection and provides opportunities for youth to learn about careers in green industry; see stlgreenteens.org for details. Sustainable funding for the summer youth Tree Tenders program is actively being sought at this time. For more information, contact info@moreleaf.org.

Forest ReLeaf of Missouri, 2018 in Review

Forest ReLeaf of Missouri has two main programs, in addition to our outreach and education efforts. Both programs, Project CommuniTree and Priority ReLeaf focus on providing quality native trees and shrubs for planting on public land free of charge. Project CommuniTree provides 3-gallon containerized trees and shrubs for anybody who wants to plant on public or non-profit owned land. There is no geographic restriction for the program and groups or individuals can apply for as many trees as they can care for. Priority ReLeaf provides plant material for financially underserved areas or areas that have been affected by natural disaster (storms, tornados, insect infestation, etc.). While Priority ReLeaf projects can also receive the 3-gallon trees and shrubs, they are eligible to receive our larger 15-gallon planting stock. Below is a review of 2018 program accomplishments and other highlights of the year.

Project CommuniTree:

In 2018, we provided 7,132 trees to over 150 planting projects throughout the region, including several in Illinois and Kansas. 295 volunteers contributed a total of 5,684 hours at CommuniTree Gardens Nursery in order to containerize, grow and distribute the trees that were given away. 8,000 trees are currently being overwintered at CommuniTree Gardens Nursery that will be given away in the spring of 2019.

Priority ReLeaf:

In 2018, we provided 3,701 trees to over 40 projects located in financially underserved areas or areas affected by natural disaster. 925 volunteers contributed 7,402 hours towards this effort. This includes 4 planting projects organized by Forest ReLeaf in cooperation with City of St. Louis Parks, Recreation and Forestry, Sustainability Office, Police Department and Fire Department where 500 total trees were planted at 4 different St. Louis city parks. These projects were funded by a large grant from the Funders' Network for Smart Growth and Livable Communities and were well attended by the general public, regular Forest ReLeaf volunteers and City of St. Louis officials.

In addition to the 83 outreach events attended or hosted by Forest ReLeaf staff or volunteers, we also hosted a "Concert in the Trees" and our annual "Arbormeister " beer festival at CommuniTree Gardens Nursery, a 25th anniversary party in the Delmar Loop neighborhood and the annual "Crawl the Grove" young friends pub crawl in the Grove neighborhood. In total, Forest ReLeaf recorded 28,951 volunteer hours from 3,447 individuals. These hours include those contributed at CommuniTree Gardens Nursery, Forest ReLeaf community planting projects, Project CommuniTree, Priority ReLeaf projects and through our TreeKeepers course. Through these programs, Forest ReLeaf donated 10,833 trees and 984 herbaceous perennials and wildflowers in 2018.

For more information about Forest ReLeaf and our efforts, please visit forestreleafofmissouri.org.

Cultivation and Cuisine: Getting Started with Wine Cap Mushrooms

Hannah Hemmelgarn, University of Missouri Center for Agroforestry

Mushroom cultivation is a rapidly growing enterprise; The American Mushroom Institute reports that sales increased nearly 10% between 2017 and 2018. Consumers are realizing the tremendous health benefits of edible and medicinal mushrooms, and growers are realizing the ease with which fungi can be integrated in farm and home-scale systems. Bed-grown mushrooms, including oysters (*Pleurotus ostreatus*) wine caps (*Stropharia rugosoannulata*), blewits (*Clitocybe nuda*), and almond agaricus (*Agaricus subrufescens*), can be cultivated outdoors in a growing medium other than logs; these mushrooms grow well in straw mulch, woodchips, or compost. If you're new to working with fungi, there are some key factors to consider before "planting" mycelium.

The "Fungimentals"

Mycelium is the vegetative body of fungi, made up of a network of webbed hyphae strands. You've probably seen these white filaments if you've ever peeled back a piece of bark from a dead or dying tree. If the growing medium (wood chips, straw etc.) is already colonized with mycelium, it may not be a good host for your cultivated fungi.

Mushrooms are the "fruit" of fungi. When conditions are right, the mycelium mass will begin to "pin" and mushrooms will emerge within a few days, eventually "ripening" to release millions of spores. Be sure your mushroom yard is located where you can see when mushrooms begin to fruit in order to harvest them while they're in good condition.

Mushroom spawn is mycelium in a growing medium (often sawdust or grain), propagated in environments where other fungus cultures do not have an opportunity to mix with the desired species. When purchasing mushroom cultivation supplies, a 5.5lb bag of sawdust spawn is generally sufficient to inoculate 40 square feet of mulched bed space.

In order for mycelia to successfully colonize a growing space, they need appropriate moisture, temperature, and ventilation conditions. Check on your mushroom bed regularly to monitor the condition of your mushroom bed. The recommended inoculation techniques described here will help you achieve a suitable home for your fungi.

Learn more and order supplies at
www.fieldforest.net or at www.fungi.com

Freshly harvested wine cap mushrooms grow well in straw and woodchip mulch beds. Their "stem butts" can be transplanted to other parts of your farm or garden.

While there are around 145,000 known species of fungi on planet earth (and an estimated 5 million more that have yet to be identified), relatively few are cultivated. Saprotrophic fungi obtain their energy from non-living organic matter; these are the most commonly cultivated fungi. Whether or not you like to eat them, we can all be grateful for saprotrophic fungi; they work day in and day out to build soil by breaking down fibrous materials. Most bed-grown mushroom species are saprotrophs; as such, they will "consume" the straw or woodchip mulch you provide them and must be "fed" more in order to continue to thrive.

Wine cap mushrooms are abundant producers that will begin to fruit after just six months from inoculation time. Even the stems of this mushroom are delicious, and they can easily be propagated from mycelium masses into other parts of your garden.

How to Grow *Stropharia rugosoannulata* (wine cap) Mushrooms

Before you get started, assess your mushroom cultivation objectives by asking yourself the following questions:
Am I going to grow mushrooms for personal consumption or for sale? If I'm growing them to sell, what is the market for this variety of mushrooms in my area? Are there people already selling mushrooms at my local farmers market, grocery stores, or to restaurants? Who will buy my product, and how much can I expect to grow given the space I have dedicated to this purpose? How much can I sell them for? Will this price account for my up-front and ongoing costs, including labor?

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What is it you do again?

Hank Stelzer, University of Missouri Extension

As I was reading the Letters to the Editor in the latest issue of my monthly trade newspaper, The Forestry Source, Ryan Mansfield's (Bonney Lake, WA) caught my eye. And it reminded me of a piece I wrote for Green Horizons several years ago.

I remember the Christmas before receiving my Bachelor of Science in Forestry having a conversation with family members regarding my life after college. My older sister asked, "So, just what will you do after you graduate?" I already knew where this conversation was headed in part because throughout my college days she had given me several Smokey Bear items; that year's installment being a miniature Smokey Bear stuffed animal in my stocking.

After politely listening to me explain how I would help manage 'our' forests to produce the wood products society wants along with 'other' benefits, she wryly replied, "So, you will put out forest fires?" as she played with Smokey's hat. I said, "Perhaps." But, that putting out fires was just a small part of the job.

After several more attempts to describe what a forester did, and several more verbal jabs from sis, I realized two things. First, she was really having a hard time fully appreciating the role a forester plays in natural resource management. And second, I was having a really hard time explaining it!

Flash forward some 44 years later…
As Ryan pointed out in his letter, if you ask a person on the street what a lawyer does, you will likely get an informed answer about defending clients, lawsuits, and litigation. Ask them what a doctor does and you will get an equally informed answer. Teacher? Same result. Even asking someone what an auto mechanic does will draw a more informed response compared to asking that same person what a forester does.

Ryan went on to challenge foresters to have their "elevator pitch", a 30-second blurb about ourselves and what we do. So, here's mine.

Foresters speak for the land. Our highly polarized world today needs natural resource professionals with no proverbial dog in the fight. We work tirelessly to understand and apply elements of biology, botany, ecology, economics, engineering, social science, statistics, hydrology, soil science and other fields to sustain the benefits society expects from forested landscapes beyond jobs and wood products; clean air, clean water, recreation and rejuvenation of the human spirit. Our clients, relatives, friends and neighbors may not understand the science behind what we do, but they will know we are dedicated professionals managing the land in the best way possible for our generation and generations to come.

How to Grow Wine Cap Mushrooms

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Obtain about 1 cubic yard of slightly aged hardwood tree woodchips (these can be easily acquired from tree pruning companies or city utility workers) and-mp a couple bales of straw. Submerge straw bales and/or chips in a stock tank or large tub of water for 1-3 days. Winecap mushrooms need soil contact, so clear your growing site before spreading a few inches of woodchips. Sprinkle sawdust spawn over the area generously and cover with an additional 2 inches of chips or straw. Sprinkle another layer of spawn over the growing medium and continue to layer with soaked straw and chips until you have exhausted your soaked growing medium supply. Cover the bed with a thick layer of dry straw or a tarp to prevent it from drying out. One 5.5 lb bag of spawn will cover a 30-50 square foot area 4-6 inches deep. After a couple months, remove the tarp and peek into the bed to check for mycelium colonization. Allow spring rain to keep the bed moist and watch for small humps in the mulch where mushrooms may be emerging. Harvest wine caps just before the caps break free from the "annulata" or ring around the stem.

To cook wine cap mushrooms, slice each one from top to bottom, in half or quarters, and sautee for ~20 minutes with any cooking oil or other fat, in an open pan to allow moisture in the mushrooms to evaporate. Add salt and pepper to taste. A little tamari or soy sauce enhances their meaty flavor. Enjoy your wine cap mushrooms paired with asparagus and rice, piled on a hamburger, or in combination with other spring vegetables.

The Basis for the Black Walnut Initiative

Harlan Palm, former Missouri Walnut Council President

About 45 years ago, I bought a small tract of land in Callaway County with white oak on the hills and several uneven-aged black walnut in a pasture along a shallow creek. Since I did not have any cattle on the bluegrass pasture, hundreds of volunteer seedling walnut emerged. Pruning and thinning soon became an annual event.

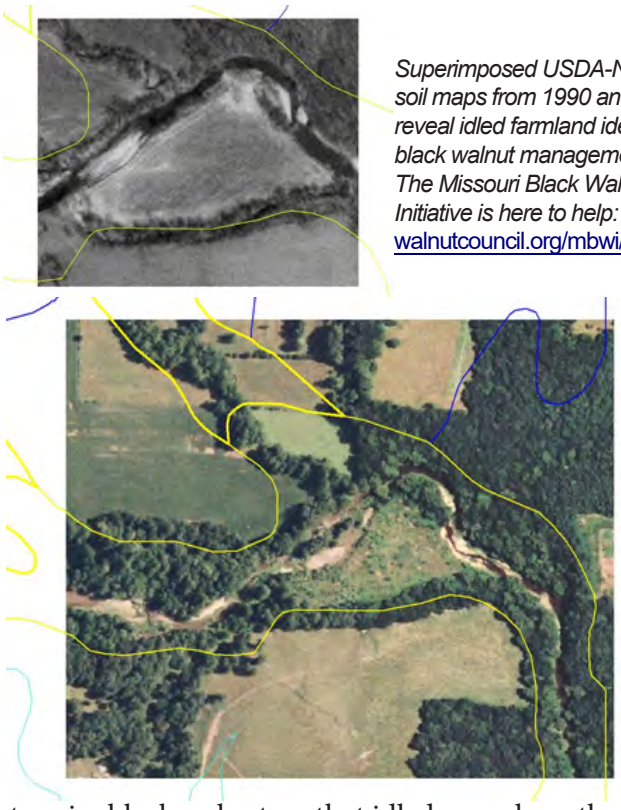
In 2001, I started helping farmer-landowners by doing Timber Stand Improvement while favoring walnut on EQIP (Environmental Quality Incentives Program) contracted acres. These farms were in Callaway County with timber along the Auxvasse, Richland, Bachelor and Loutre Creeks. I was impressed and envious of the size and quality of walnut I saw along those creeks compared to some of mine and most of the plantations trees I pruned.

Some of these awesome walnut trees were 26-34" DBH, remarkably straight and limbless for 25-40 feet. Furthermore, none of these veneer quality trees had ever been touched by man, let alone manually pruned. A couple of the landowners indicated that their father remembered that the timbered area had been pastured or had small cultivated fields in the creek bottom.

Out of curiosity, in 2003 I accessed aerial imagery provided by MU's CARES Imagery. I viewed forested, small fields and pastured land along various creeks. In some instances, I could see random, irregular shaped areas with various sized green spots indicating that something was starting to grow. I could compare the colored imagery with 1990 B&W imagery. The green spots were likely fast growing sycamore, maple or maybe even multiflora rose bushes. This was evidence that the small area had been idled 5-10 years prior.

I super imposed USDA-NRCS soil maps. If it was Haymond or Landes Silt Loam, I got excited as they are the most suited for black walnut in Callaway County. I assumed the landowner had recently decided to discontinue farming the small irregular field or pasture. The following photos were taken in 1990 and 2007 respectively. The soil was mapped as Landes Silt Loam.

Supported by an NRCS Conservation Innovation Grant and the National Walnut Council, I contacted 24 landowners via the county plat book, courthouse records and neighbors. I showed them aerial pictures of their idled creek bottom area along with soil maps. I showed them photos of my young walnut stand on slightly shallower soils. They were gratified by the compliment that they have better soil. I asked them if they would like



Superimposed USDA-NRCS soil maps from 1990 and 2007 reveal idled farmland ideal for black walnut management. The Missouri Black Walnut Initiative is here to help: walnutcouncil.org/mbwi/

to raise black walnut on that idled area along the creek while emphasizing it is the most valuable timber in Missouri. They expressed remorse that they had idled the tract just because it was so difficult and inefficient to get to and to farm the small area with modern large expensive machinery. Some farmers either had discontinued raising cattle or had decided to fence their livestock out of the creek area. Change in land ownership was another reason for an area to go idle.

Most of the farmers would go with me to the creek bottom area to see what was starting to populate. If there were some walnut seed trees growing along the creek bank or edge of the field, we could typically find young walnut seedlings at least 30 yards away as spread by squirrels. I worked 3-7 years with 12 farms on this project.
My experience has been almost exclusively associated with the creek bottoms on just a portion of northern Callaway County. Just imagine how many recently idled sites there may be in the whole county and most counties in the state. There are creek bottom soils in much of Missouri that are well suited for black walnut such as Nodaway Silt Loam in Northwest MO. Avoid creek bottom areas that are subject to more than a day or two of standing flood water. Another landscape setting that is very well suited for black walnut is the deep loess soils associated with the Missouri River.

Reforestation of land in Missouri has been going on for well over a century. USDA-Forest Service data shows that Missouri has more than twice as many walnut trees greater than 5" DBH than any other state.

Educational Opportunities for Tree Care Advocates at the 2019 MO Community Forestry Council Conference

Brett O'Brien, Columbia Parks and Recreation Natural Resources Supervisor

Community tree advocates, arborists, and other tree-care industry professionals converged recently in Saint Louis for the 26th Annual Missouri Community Forestry Council Conference. This conference offered a variety of learning opportunities with both classroom and outdoor educational sessions. In a twist to the usual schedule, the conference was preceded on Tuesday March 12th by a special all day workshop, a Tree Risk Assessment Qualification (TRAQ) renewal course. TRAQ is one of several credentials offered by the International Society of Arboriculture (ISA) to help raise the standard of tree care world-wide. The value of the TRAQ credential is that it promotes the safety of people and property by providing a standardized and systematic process for assessing tree risk. A renewal course is an essential need for Individuals with the TRAQ credential to maintain their qualification, and as a result, this course carried significant value for those in attendance.

On Wednesday March 13th, a morning workshop at the Laumeier Sculpture Park called "Deconstruction of Nursery Trees and BMP for Planting" kicked off the conference program. Lead by the dynamic duo of Gary Johnson, extension professor at the University of Minnesota in St. Paul, and Dr. Rich Hauer, Professor at University of Wisconsin (Stevens Point), the workshop focused on nursery trees and tree planting. Later that day, they each spoke during the afternoon sessions on concepts integral to helping MCFC members plant and maintain healthier trees.

Arborist Andy Berg stands on the opposite side of this historic Yoshino Cherry in Tower Grove Park to explain the preservation plans to maintain this significant tree to MCFC attendees

On Thursday March 14th, the conference opened with an in-depth look at fungi and decay in trees with Dr. Chris Luley, President of Urban Forest Diagnostics LLC. Unexpectedly strong winds changed plans for an afternoon workshop with Dr. Luly scheduled at Emmeneger Park, but those willing to adapt were still able to receive an instructive lesson on tomography from Dr. Luly while examining the trees on the conference hotel grounds. Other notable presenters on Thursday covered pertinent information on EAB, climate change, developing municipal ordinances, and creating high end furniture from urban trees.

Dr.Luly (in yellow helmet) explains how the Tomograph measures the velocity of soundwaves in wood in order to non-invasively detect decay and cavities in standing trees. Austin Lampe (red helmet) assist by tapping sensors mounted temporarily on the tree with a hammer, creating soundwaves that measure decay.

The final day of the conference featured a tour of the historic Tower Grove Park with the Arboriculture Supervisor, Andy Berg. Tour attendees received an in-depth look at the park's tree management program, and learned in detail how Andy administers an inventory of nearly 7000 trees to plan and schedule maintenance tasks such as chemical applications or pruning.

By all measures, the conference was a very worthwhile educational opportunity. If you missed out, your next chance to attend will be in the fall of 2020, when the MCFC conference is scheduled to convene in Branson, at the Chateau On The Lake Resort, October 12-14. More information on future presenters and program will be available soon on the Missouri Community Forestry Council website: www.mocommunitytrees.org/

The Agroforestry Podcast: Newest Episode Now Available

Hannah Hemmelgarn, University of Missouri Center for Agroforestry

The University of Missouri Center for Agroforestry (UMCA) seeks to reach farmers, landowners, and the many professionals and peers who support them, via education and outreach efforts that increase agroforestry adoption. Workshops, webinars, publications, and events all contribute to this goal. This year, UMCA expanded this menu of media with the launch of The Agroforestry Podcast.

As information technology rapidly evolves, podcasts have become a popular way to glean new understanding, inspire creative ideas, and connect interested learners with topic-area experts. Podcasts are digital audio files made available electronically for download or direct listening online. Generally, podcasts are produced as a series, new installments of which can be received by subscribers automatically.

Several podcasts on farming and food systems are currently available from the National Sustainable Agriculture Information Service, USDA Sustainable Agriculture Research and Education, and independent producers, although none focuses explicitly on agroforestry, and few highlight agroforestry as a featured topic more than once. The Center for Agroforestry's podcast fills a niche, highlighting perennial crops, farmers, suppliers, buyers, and experts in the field.

Look for The Agroforestry Podcast logo when you search for and subscribe to the show on your preferred podcast app.

You can also tune in at www.centerforagroforestry.org/podcast.php

Since February 2019, UMCA has released four (monthly) Agroforestry Podcast episodes, each reaching around 500 new listeners. The newest episode on native herbaceous plants and elderberry is also a teaser for the Agroforestry Academy, featuring Nadia Navarrete-Tindall, a native plant expert and consultant, and Terry Durham, owner and operator of River Hills Harvest. Previous episodes include:

- "Insights from Agroforestry Change-Makers" featuring highlights from conversations with Dr. Michael Gold, Dr. Sarah Taylor-Lovell, Dr. John Munsell, Keefe Keeley, and Kate MacFarland about the benefits of and potential for agroforestry in the US;
- "Forest Farming 101", an introduction to medicinal forest plants from presenters at the Appalachian Beginning Forest Farmer Coalition's grower event, including Dr. Jeanine Davis, Dr. Eric Burkhart, and Appalachian forest farmers at the event's exhibit hall;
- "Growing American Ginseng", sharing diverse perspectives on the cultivation, conservation, and challenges of Panax quinquefolius, with forest farming professionals and growers.

To listen and subscribe to The Agroforestry Podcast, find us on your preferred podcast app, or visit www.centerforagroforestry.org/podcast.php, and stay tuned as we share the multitude of ways farmers, land stewards, researchers and educators are working to reintegrate diverse woody perennial plants into multifunctional landscapes.

Forrest Keeling Nursery specializes in native plants, offering more than 250 species. After the devastating freeze of 1991 and floods of 1993, Forrest Keeling founders saw that it was the native plants that survived, retained soil and nurtured wildlife. The nursery has an annual production of over 1.5 million seedlings, line and transplant stock that can be shipped worldwide.

Check out the Forrest Keeling Nursery Field Day on Thursday, September 12th, 2019 in Elsberry, Missouri. More details at www.fknursery.com

Welcome Ron Revord and Sarah Lovell to the Center for Agroforestry

Beginning in August of 2019, Dr. Sarah Lovell (left), currently Associate Professor of Landscape Agroecology, Dept. of Crop Sciences at the University of Illinois, Champaign-Urbana, will become the next Endowed Chair Professor and Director of the Center for Agroforestry, University of Missouri. Over the past twenty years, Dr. Lovell has developed a robust research program designed to advance the understanding of agricultural sustainability through the design of multifunctional food production systems. She has assembled strong interdisciplinary research teams to accomplish her research goals. Her research has helped to transform our scientific thinking on the integration of ecological principles and agriculture production at varying scales.

Over the course of her career, Dr. Lovell has established a national and international reputation as an integrator of complex multi-disciplinary questions related to the design of multifunctional food production systems. She has demonstrated her ability to advance those concepts through a combined body of peer-reviewed publications and competitive grant funding.

Dr. Ron Revord (left), will also join the Center for Agroforestry team, starting in June of 2019. Ron will take the lead on Dr. Mark Coggeshall's prior (2000-2017) tree improvement and genetics research, with new initiatives related to restoration of the Ozark chinquapin and hybrid hazelnut research. Ron completed his PhD this year in the Dept. of Crop Sciences at the University of Illinois, where he worked with Dr. Sarah Lovell on the multifunctional woody polyculture for sustainable food production program. Ron is also co-founder and current Chair of the Board of Directors for the Savanna Institute, where he has demonstrated his commitment to agroforestry science and adoption.

Bid Box

Hank Stelzer, University of Missouri Extension, School of Natural Resources

Randolph County

- 24 acres
- 227 marked trees
- Estimated total volume 35,070 bd ft (Doyle Scale)
  - 21,000 bd ft white oak, 2,500 bd ft were stave quality
  - 5,000 bd ft northern red oak
  - 7,000 bd ft black oak (7,000 feet)
  - 2,070 bd ft mixed hardwoods, including three walnut trees, two of which were potential veneer quality
- Forester estimated value of $11,000
- Four bids received:
  - $12,156
  - $7,501.50
  - $6,658.64
  - $4,350
- Landowner accepted high bid. The forester was surprised with the range of bids for an oak sale. The two lower bids were from individuals that don't often buy timber lump-sum, so were probably inexperienced with this type of sale.
- Return: $506/ac

As always, it pays to have a professional forester market your timber. Not only will they help you get the highest price for the trees in your woodlots that need to be harvested, but they can help ensure future harvests are profitable, too! To help you become familiar with some of the aspects of selling timber, check out the following MU Guides:

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

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

Species Spotlight: Pecan *Carya illinoinensis*

Michael Gold, University of Missouri Center for Agroforestry

The pecan (Carya illinoinensis) is a species of hickory native to northern Mexico and the southern United States. "Pecan" comes from an Algonquian word variously referring to pecans, walnuts and hickory nuts requiring a stone to crack. As of 2014, the U.S. produced 264.2 million pounds of pecans, with 75% of the total crop produced in Georgia, New Mexico and Texas. Pecans can be grown from USDA hardiness zones approximately 5 to 9, and grow best where summers are long, hot and humid. The northern limit of the commercial range of pecan is located in Missouri, just north of Interstate I-70.

Pecan is a large, beautiful tree that produces bountiful crops of delicious nuts. The largest member of the hickory family, pecan trees often grow to a height of more than 70 feet with a spread of greater than 80 feet. Pecans have large, pinnately compound leaves with each leaf bearing seven to 13 leaflets. Nuts are borne on branch terminals in clusters of two to five. A fleshy green husk surrounds the nut during the growing season but splits open in October to reveal a light brown nut streaked with black mottles. As husks dry and wither, nuts fall freely from the tree. Pecan nuts vary widely in size, shape and shell thickness. Seedling pecan trees often produce small, thick-shelled nuts while trees grafted to improved cultivars produce large, thin-shelled nuts.

Multipurpose Trees

In the home landscape, these long-lived and sturdy trees provide ample shade and bright yellow fall color. Wildlife conservationists appreciate the food and cover pecan trees produce for squirrels, turkeys and deer. In many areas of Missouri, wild pecan trees have been brought under cultivation to provide farmers with an additional source of income. In addition, pecan cultivars can be grown in commercial orchards using alley cropping designs in the early years to offset initial costs of production.

Food and Wood

Pecan can be eaten fresh or used in cooking, particularly in sweet desserts, such as pecan pie and praline candy. Pecan wood is used in making furniture and wood flooring, as well as a flavoring fuel for smoking meats.

Soil Requirements

Plant pecan trees in deep, well-drained soils. Native pecans grow primarily in the deep alluvial soils found along major rivers and streams. These soils are characterized by a clay loam to sandy loam texture with good internal drainage. Pecan trees will grow and thrive in soils that range from slightly acid to slightly basic (pH 6.0 to 7.5), grow in the major floodplains of Missouri and are tolerant to seasonal flooding.

Cultivar Selection and Recommended cultivars

Selecting the proper cultivars for your particular locality will help ensure your pecan tree planting will be successful. When choosing pecan cultivars, several key characteristics should be considered, including: Length of growing season; Winter hardiness; Productivity; Flowering and pollination; and Nut size and quality.

Establishing Pecan Trees in Orchards or Alley Cropping

Orchard grown pecans trees should be planted 30 to 35 feet apart. Alley cropped pecans can be planted in a double row configuration to maximize the area for intercrop (e.g., wheat, corn, soybeans) production. See Figure 1 – Double row pecan alley cropping.

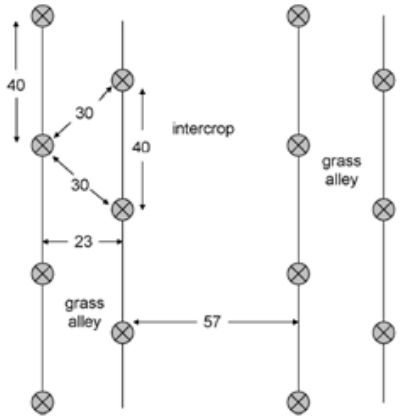


Fig. 1. Double row planting for pecan orchards. Distances in ft. Tree locations marked by circles.

Length of growing season

Pecan trees use the entire growing season to develop and mature their nut crop. Summer heat, especially high nighttime temperatures, is necessary for proper nut development. Unusually cool summers will result in a delay of nut maturity. A pecan cultivar must produce plump, well-filled nuts before the first fall freeze. Nut maturity in pecan is indicated by the splitting of the shuck and separation of nut from shuck.

Species Spotlight: Pecan *Carya illinoinensis* *continued from page 9*

Winter hardiness

"Northern" pecan cultivars, originating in the northern-most reaches of the pecan's natural range, have proven cold hardiness and are best adapted to growth in Missouri.

Seedlings and Cultivars

Seedling pecan trees are widely available from nurseries or the Missouri Department of Conservation. Desired cultivars should be grafted to seedling trees 2 to 3 years after establishment. Nut production should begin 4 to 6 years after grafting. Starting a pecan planting with seedlings offers the advantages of low initial costs and the opportunity to establish cultivars not available from commercial nurseries. Disadvantages include a delay in the onset of nut production and the expense of grafting your trees.

Care of Bearing Trees

Healthy, vigorous trees produce the highest quantity and quality of pecans. Maintaining a strong growing tree is the best defense against attacks from insects and disease. Water, fertilizer and pest control are all important for healthy tree growth. Insect and disease problems can severely limit the nut production of a pecan tree although no pests are serious enough to cause tree death. A permanent groundcover of cool-season grasses and legumes should be established in the bearing pecan orchard. Keep this permanent groundcover mowed throughout the growing season. In the home orchard, a well-kept lawn grass serves as the groundcover.

Fig. 2. Double row pecan planting four years after tree establishment

Nutrition and Flavor

Pecans are a good source of protein, fiber and heart-healthy fats, pecans are rich in ellagic acid, which may prevent certain cancers. They have also been linked to fewer heart attacks in several large studies. The USDA ranks pecans as one of the best sources of antioxidants (and the highest among nuts).

Northern pecans are smaller and sweeter than the jumbo-sized hybrid nuts grown in the southern United States. This richer, more buttery flavor is due to the higher content of monounsaturated and polyunsaturated oils. Chefs across Missouri, and even New York-based food writers, have commented on the difference in flavor from Missouri-grown pecans.

For more information on pecan alley cropping, propagation and management, explore the print resources available at the Center for Agroforestry's webiste: www.CenterforAgroforestry.org/pubs/ where you'll find the following Agroforestry in Action infosheets:

"Growing Pecans in Missouri"
"Propagating Pecan and Black Walnut"
"Why Pecans: NUTrition and Your Health"
and many others.

Fig. 3. Double row pecan planting two years after tree establishment

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editorial board

CONTRIBUTORS

Walnut Council, Missouri Chapter

Missouri Christmas Tree Producers' Association

Conservation Department Missouri

Forrest Keeling Nursery RPM

Forest Service US Department of Agriculture

Missouri Nut Growers Association

missouri Forest products association

Missouri Department of Agriculture

Wood Water Recreation Wildlife Certified Tree Farm

Missouri Consulting Foresters Association

Missouri Department of Natural Resources

Forest & Woodland Association of Missouri

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

CONTACT GREEN HORIZONS

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

Mike Gold, Hannah Hemmelgarn, or Hank Stelzer:
co-editors Green Horizons
University of Missouri
203 ABNR
Columbia, MO 65211
goldm@missouri.edu | (573) 884-1448
hemmelgarnh@missouri.edu | (573)882-8321
stelzerh@missouri.edu | (573) 882-4444

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UNIVERSITY OF MISSOURI Extension

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

The Center for Agroforestry
University of Missouri
A Global Center for Agroforestry, Entrepreneurship and the Environment

Calendar of Events

2019 World Congress on Agroforestry
May 20-22, 2019 | Le Corum Conference Centre, Montpellier, France
More than 1000 delegates and leading keynote speakers from around the world will contribute to this event. the overall objective of the Congress is to contribute to the progress of agroforestry science and practice in order to bridge the science-policy gap. Major topics include agroforestry and climate change, food security and nutrition, adoption, and policy, with special attention to vulnerable countries and populations. More information and registration at https://agroforestry2019.cirad.fr/

Agroforestry in Action Webinar: Silvopasture in Wisconsin "Fodder" for Thought
May 29, 2019 | 11:00am-12:00pm CST | Free online event
Diane Mayerfeld, of the University of Wisconsin Center for Integrated Agricultural Systems, will address goals, challenges, and other "fodder" for thought about silvopasture in Wisconsin during this online webinar hosted by the Center for Agroforestry. This seminar is free and open to the public, but registration is required.
More information and registration at https://agroforestryinaction.wixsite.com/agroforestryinaction

Chestnut Growers of America Annual Meeting
June 7-9, 2019 | W.K. Kellogg Biological Station in Hickory Corners, Michigan
The Chestnut Growers of America 2019 Annual Meeting program will include expertise from around the country addressing invasive pests, marketing, chestnut genetics, and much more. The event will include a cocktail reception, a walking tour of the facility grounds, and optional orchard tours. Registration closes May 31st. For more details and registration, go to http://www.chestnutgrowers.org/

2019 Comprehensive Elderberry Workshop
June 13-15, 2019 | Midwest Elderberry Cooperative | The Carver Center, Jefferson City, Missouri
The Comprehensive Elderberry Workshop & Field Tour delivers the best new knowledge on elderberry from expert researchers and successful growers. The New Growers Workshop will be held on June 13th 1-5pm; Workshop and Field Tours will be held on June 14th and 15th. Information and registration at https://www.riverhillsharvest.com/comprehensive-elderberry-workshop

2019 North American Agroforestry Conference
June 24-27, 2019 | Association for Temperate Agroforestry | Corvallis, Oregon
The Association for Temperate Agroforestry will convene for the 16th AFTA Biennial Conference, this year focusing on Agroforestry for Sustainable Production and Resilient Landscapes. Program details and registration at www.afta2019.orgɵ Early r gistrati n ends May 24th

7th Annual Agroforestry Academy
July 21-26, 2019 | Center for Agroforestry | University of Missouri campus, Columbia, MO
The Agroforestry Academy is a week-long intensive training that includes integrated classroom workshops, multiple farm visits, hands-on demonstrations, and practical on-farm agroforestry planning and design to advance adoption of agroforestry as a cornerstone of productive land use. Scholarships are available for US veterans. More information at http://www.centerforagroforestry.org/academy/2019/RegistrationBrochure.pdf

Agroforestry Field Day
September 14, 2019 | The Land Connection | Sidney, Illinois
Agroforestry is a term for agricultural practices that maximize biodiversity and management efficiency, and assure high productivity across the farm with integrated perennial crops. Join the Savanna Institute and The Land Connection to see first-hand how an agroforestry system can work in central Illinois. You will visit two working farms, meet successful agroforestry farmers, and hear practical advice for establishing your own operation. https://thelandconnection.org/agroforestry