



Action in Agroforestry

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Michael Gold and Hannah Hemmelgarn, editors

Pawpaw Named Missouri State Fruit Tree

On July 11th, 2019, Governor Mike Parson signed Senate Bill 210 designating the pawpaw (*Asimina triloba*) as the Missouri state fruit tree, among other new designations. Sponsored by Senator Karla May and Representative Jeffery Justus, this bipartisan legislation was recommended by students at a St. Louis elementary school. The students suggested that the pawpaw has merit as a symbol for Missouri given that pawpaws are native to Missouri, and their nutritious fruits ripen in August, when the state was founded.

This new accolade for pawpaw is likely to raise awareness about this delicious native fruit (pictured, right), and the Center for Agroforestry is prepared to support this growing interest. Pawpaw is a high value specialty crop that can address conservation and financial objectives on Missouri farms. With support from a Missouri Department of Agriculture Specialty Crop Block Grant, the Center will assess consumer preferences for pawpaw at a number of farmers market tasting events later this summer (*details forthcoming in the August edition of Action in Agroforestry*).



Two mature grafted pawpaw cultivar orchards are maintained at the University of Missouri's Southwest Research Center and the Horticulture and Agroforestry Research Center. Information collected about management, yields, cultivar selections and marketing strategies will be presented during two field events this year: August 23rd at HARC in New Franklin, MO, and September 20th at the Southwest Research Center in Mount Vernon, MO. More details about these events can be found in the events section, For more information about pawpaw in Missouri: <http://www.centerforagroforestry.org/pubs/pawpaws.pdf>

UK Food Scientist Visits HARC Elderberry Plots

Alice Jones, M.S., is a food scientist at the University of Nottingham and a 2019 Nuffield Farming Scholar working in research and development for product and process technical improvement, knowledge transfer and entrepreneurship for fruits, flowers, herbs, and spices that may be processed into premium food ingredients. She is a champion for the authenticity and integrity of food products, and has recently focused on elderflowers, from varieties and cultivars to capturing, extracting, and preserving the flavor quality in processed products. Jones has traveled extensively in Europe working collaboratively with elderflower traders and suppliers, and recently visited the University of Missouri Center for Agroforestry's Horticulture and Agroforestry Research Center in New Franklin, Missouri. As a Nuffield Farming Scholar, she is exploring commercial cultivation of elderflowers, and the path of a wild plant into domesticated commercial cultivars recognized in the Midwest as a cash crop. During her visit to the HARC elderberry research plots, she met with Sam Sergent, M.S. student at the Center for Agroforestry working with Dr. Andy Thomas. *Photo: Alice and Sam in the elderflower research plots at HARC.*



Publications

- Alagele, S., S. Anderson, R. Udawatta, K. Veum, and L. Rankoth. 2019. Effects of conservation management practices on soil quality parameters compared to row crop management. Proceedings of the 4th World Congress on Agroforestry: 206.
- Gold, M.A. 2019. Tracing 35 years of agroforestry development in the USA: Past, Present, Future. Proceedings of the 4th World Congress on Agroforestry: 865.
- Rosati, A., K. Wolz, L. Murphy, L. Ponti and M. Gold. 2019. Do agroforestry models overestimate photosynthesis and RUE of understory crops? Proceedings of the 4th World Congress on Agroforestry: 819.
- Schneider, S.J., A.Y Hwang, S.D. Land, Li-Ling Chen, A.L. Thomas, Chin-Feng, Hwang. 2019. Genetic diversity of ten black walnut (*Juglans nigra* L.) cultivars and construction of a mapping population. Tree Genetics & Genomes: 15: 62.
- Thomas A., R. Kallenbach, T. Sauer, D. Brauer, D. Burner, M. Coggeshall, C. Dold, W. Rogers, S. Bardhan, and S. Jose. 2019. Carbon Dynamics within Four Black Walnut Alley Cropping Sites across Missouri and Arkansas, USA. Proceedings of the 4th World Congress on Agroforestry: 51.
- Udawatta, R.P., S. Jose, and L. Rankoth. 2019. A Paired Watershed Evaluation of Agroforestry and Bioenergy Effects on Water Quality on a Corn/Soybean Rotation. Proceedings of the 4th World Congress on Agroforestry: 196.

KUDOS

Dr. Chung-Ho Lin, Research Associate Professor at the Center for Agroforestry, with Dr. George C. Stewart and Brian M. Thompson, received his third patent, No.10,081,790 from the US Patent and Trademark Office for ***Bacillus-Based Delivery System and Methods of Use***. In collaboration with the MU Department of Veterinary Pathobiology and the MU Life Science Center, our team has developed a novel spore-based enzyme display system, which can genetically display high levels of proteins on the spore surface. The spore acts as the support platform for enhanced activity and stability of the displayed enzymes. These biocatalysts function as bioparticles and 1) can persist in soil environments to enhance activity of enzymatic molecules for the bioremediation of pollutants; and 2) display and stabilize industrially important enzymes to create substances used in the food industry, biofuel/biodiesel industry and green energy industry, or to eliminate potentially toxic or inhibitory byproducts from these reactions. The technology has been successfully licensed to these industries.

Congratulations to incoming UMCA Director, Dr. Sarah Lovell, (with Badege Bishaw (at left) and Gary Wyatt (at right)) who received the Association for Temperate Agroforestry's **Research Award** for outstanding accomplishments in the field of agroforestry at the 16th Biennial North American Agroforestry Conference on June 27th, 2019, at Oregon State University, Corvallis, OR. Dr. Lovell's outstanding research has focused on multifunctional landscapes, urban agriculture, and productive agroforestry systems. Read more about Dr. Lovell's research at <https://cropsciences.illinois.edu/people/profile/stlovell>



Efrat Novianus, M.S. student at UMCA, was also recognized at the North American Agroforestry Conference as first place winner of the research poster contest. Efrat's poster described his research on Switchgrass (*Panicum virgatum*) bioactive compounds profiling through untargeted and targeted analysis.

MU Signs 3 New MOUs with Indonesian Institutions

Following up on recent visits from Dr. Chung-Ho Lin to Indonesia, three new Memoranda of Understanding (MOUs) are now in place:

- 1) Bogor Agriculture University Department of Biology (IPB) Indonesia (IPB/CAFNR)
- 2) Bogor Agriculture University Department of Mathematics and Natural Sciences (IPB) Indonesia (IPB/CAFNR)
- 3) Atma Jaya Catholic University, Indonesia (Atma Jaya University/CAFNR)

UPCOMING EVENTS

Diversified Agroforestry in Iowa Field Day

July 20, 2019 | 1:00pm – 5:00pm | Savanna Institute | Red Fern Farm, Wapello, IA

Red Fern Farm is a family owned nursery and farm run and owned by Tom Wahl and Kathy Dice. It is the site of ongoing research on a variety of tree crops and forest farming systems. Tom and Kathy raise and sell container-grown tree seedlings and medicinal plant roots well-suited for the Midwest. At the field day, Tom and Kathy will give a tour of their farm, including chestnut, pawpaw, persimmon, and other mature plantings. Sign up by following the link for this event at <http://www.savannainstitute.org/events.html>.

Northern Nut Growers Assoc. & North American Fruit Explorers Annual Meeting

July 28 - 31, 2019 | NAFEX/NNGA | Graduate Hotel, Iowa City, IA

The joint annual meeting of the Northern Nut Growers Association and North American Fruit Explorers is open to all people with an interest in nut and fruit trees. This multi-day event includes technical sessions, field tours, an exhibit hall, and many networking opportunities.

More information and registration at <https://nutgrowing.org/nnga-2019-annual-conference/>.

Elderberry Harvest Demonstration and Farm Tour

August 2, 2019 | River Hills Harvest | 19010 S Mackie Ln., Hartsburg, MO

Get ready for harvest with this small group intensive. Only 20 spots are available for this hands-on learning opportunity packed into one afternoon. See fields ready for harvest, destemming, sanitation and packing procedures. Products and plants for sale, all cash. \$20 per person to register, pay on-site. Email info@riverhillsharvest.com to sign up. More information at <https://www.riverhillsharvest.com/terry-durham-s-elderberry-harvest>.

Practical Farmers of Iowa Carney Family Farm Tour

August 3, 2019 | Carney Family Farms | Maxwell, IA

This working farm silvopasture field tour will include featured speakers Keefe Keeley from the Savanna Institute, on the impact of agroforestry for Midwest farms; Luke Gran from Prudenterra, on the Carney's forestry plan; and Clint Miller from Polk County Natural Resources Conservation Service, on cost-share opportunities for agroforestry practices. RSVP by July 31st at <https://practicalfarmers.org/events/>.

Growing and Marketing Pawpaw Workshop

August 23, 2019 / 1:30pm – 5:00pm / Horticulture and Agroforestry Research Center, New Franklin, MO

Learn about the pawpaw, Missouri's state fruit tree, and a "new" specialty crop for Missouri producers during this field event. Researchers, farmers, and specialty crop economists will discuss up-to-date information about successful cultivation, processing, and marketing of pawpaw (*Asimina triloba*). Participants will also have the opportunity to taste samples of pawpaw and value-added pawpaw products. This event is free but advance registration is required. Contact Caroline Todd at toddcs@missouri.edu or by phone (573)884-2874 to register.

Agroforestry in Action Webinar: Chestnuts in the Northeast

August 28, 2019 / 11:00am CST / Free online webinar / University of MO Center for Agroforestry

Jono Neiger and Russell Wallack will present about implementation strategies, economics and remaining challenges of chestnut agroforestry in the northeast during the August webinar. To register, visit <https://agroforestryinaction.wixsite.com/agroforestryinaction>.

Agroforestry in the Heartland Field Day

September 14, 2019 / Midwest Agroforestry Solutions, The Land Connection / Vulcan Farm, Sidney, IL

Join the Savanna Institute and The Land Connection to see agroforestry in action in Central Illinois. During this field day, participants will visit two working farms owned and managed by Midwest Agroforestry Solutions, meet successful agroforestry farmers, and hear practical advice on how adding trees can help grow your farm. More information and registration at <http://www.savannainstitute.org/events.html>.

Opportunities with Chinese Chestnuts

September 18, 2019 / 1:30pm – 5:00pm / Horticulture and Agroforestry Research Center, New Franklin, MO

Chinese chestnuts are a viable crop for Midwest producers. During this field event, participants will tour chestnut orchards, meet with MU researchers and experienced growers, and hear up-to-date information about successful cultivation and marketing of chestnuts. There is no cost to participate, but advance registration is required. To register, contact Caroline Todd, toddcs@missouri.edu, or by phone (573)884-2874.



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