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AGROFORESTRY ABROAD

Hawaiian Travels with Natalya Kutsokon, Visiting Scientist

Dr. Kutsokon is a research scientist at the Institute of Cell Biology and Genetic Engineering of National Academy of Sciences of Ukraine. She was awarded a Fulbright grant to conduct research on “Advancing the Methods for Planting and Creating New Clones of Poplars for Short-Rotation Forests” at the MU Center for Agroforestry working with Center Director Shibu Jose as a visiting scientist.

During her time in Missouri, Natalya dreamt of traveling to the Hawaiian Islands to see their unique tropical flora.

With the travel support of Occasional Lecture Fund (OLF) for Fulbright Visiting Scholars, her dream became reality. Dr. Kutsokon was invited, through OLF, to present lectures on “The Importance of Transgenic Plants in Modern World” at Kauai Community College (KCC), a part of the University of Hawaii system and the only college on the island of Kauai. One very important transgenic plant is the transgenic-papaya. Created in 1998, its development has helped the Hawaiian papaya production by



Photo Courtesy | Natalya Kutsokon

Dr. Kutsokon with the Kauai Community College students and faculty.

saving plantations from the severe damage of the Papaya ringspot virus.

During her short visit, she was involved in many other activities. Dr. Sharadchandra Marahatta gave her a tour of the research activities in KCC and Dr. Adrienne Kleintop took her to visit the McBryde Garden, which is a part of the National Tropical Botanical Gardens. It was an absolutely unforgettable experience for Natalya.

“Visiting [the] Kauai Community

College enriched my biological background,” Natalya said.

Sharing her biological knowledge and teaching experience was also very important, she said.

Through the University of Hawaii system, “I’ve met great people and found new friends,” Natalya said. “My overall Fulbright experience in Mizzou and the U.S. is amazing, but with OLF support it is even more amazing!”

Fall HARC Field Day Educates the Public

by Hannah Hemmelgarn

On Saturday, October 5, the Horticulture and Agroforestry Research Center farm in New Franklin, Mo., hosted its annual field day. The event provides an opportunity for the public, including farmers and landowners, to learn about some of the cutting edge methods and outcomes of horticulture and agroforestry research.

Due to inclement weather, visitors were shuttled by bus to the sites that tested the viability of these innovative farm and forest practices. Researchers offered information about 35 unique grape cultivars, riparian buffer impact on runoff mitigation, shade tolerance in alley cropping, flood tolerant species and silvopasture, among other pursuits. Chestnut cultivation and black walnut tree breeding for optimal edible harvests are also at the forefront of the farm's investigations.

The HARC farm's pine straw research is a prime example of a practice that has growing market potential for Missouri farmers. Baled pine needles sold as retail garden mulch

"can generate two thousand dollars per acre per year" in gross income, according to Ray Glendening, the HARC Farm Superintendent who spoke about the farm's pine straw production during the field day. Biomass cultivation on the farm, including switchgrass, willow, cottonwood and sorghum, also has an increasingly important presence in agriculture for alternative fuels and energy.

In addition to research demonstrations, Dr. Gene Garrett offered a detailed walk-through of the restored Thomas Hickman House. The building is one of Missouri's oldest brick homes, which now serves as an educational window into life in the early 19th century.

Following the tour, visitors were invited to enjoy a warm lunch with MU faculty who are associated with the HARC farm. It was an opportunity for socializing, and for further understanding between faculty and field day attendees interested in implementing agroforestry into their own operations.

RESEARCH: Markers show inconsistent relationships in some chestnut cultivars

McCleary TS, M McAllister, M Coggeshall, J Romero-Severson. 2013. EST-SSR markers reveal synonymies, homonymies and relationships inconsistent with putative pedigrees in chestnut cultivars. *Genetic Resources and Crop Evolution*. 60 (4) 1209-1222.

Abstract

Over the last two centuries, chestnut breeding programs in Europe and Asia have generated an array of chestnut interspecific hybrids, primarily of European (*Castanea sativa*), Japanese (*C. crenata*) and Chinese (*C. mollissima*) ancestry. During this same period, Europeans colonizing North America imported hybrid

chestnuts and made interspecific hybrids with native chestnuts, primarily American chestnut (*C. dentata*). The importation of Chinese chestnut into the United States in the late 19th century also introduced a chestnut blight, which triggered an additional interspecific hybridization effort in an attempt to develop blight resistant American chestnuts.

Chestnut cultivars used for nut production in the United States and Canada have arisen against this background of non-native introductions and extensive hybridizing. The development of regionally adapted nut producing trees with dependable crops of high quality nuts requires sorting out the identities of existing cultivars.

We chose 11 EST-SSR markers from *C. mollissima* for the initial task of genotyping 65 chestnut cultivars that grow well in the central United States. Many of these cultivars have interspecific pedigrees involving two or more species.

We found extensive homonymies and synonymies, genetic groups inconsistent with published pedigrees, contradictory pedigrees and evidence for incorrect species assignments. Accurate inference of the interspecific ancestries of cultivars grown in the United States and Canada will require genotyping of species reference sets for *C. sativa*, *C. crenata*, *C. mollissima*, *C. dentata* and possibly *C. pumila* (the Ozark and Allegheny chinquapins).



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