

## THE MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION



### Summer Research Cultivates Wild Plants for Medical Use

Ganisher Abbasov spent his summer feeling the Mississippi heat while cultivating and harvesting plants for his Ph.D. research project on medicinal compounds found naturally in plants.

A native of Uzbekistan, Abbasov has been in the U.S. for five years and at Mississippi State University since March 2006. A Ph.D. student studying agronomy at MSU, he already holds a doctorate in agricultural chemistry from Russia.

Abbasov's project involves the study of American mayapple, lemongrass and basil. Abbasov is studying how nutrients, location and soil type affect plant productivity and medicinal compounds in those plants. He said his data should allow him to develop a program of steps for farmers or commercial producers to follow to get higher quality and more product in a short period.

"I want a system to know what to use to get particular medicinal compounds from plants," Abbasov said. "We are studying the effects of nitrogen and sulfur on crop productivity, on the synthesis and accumulation of essential oil in basil and lemongrass and on the anticancer compound podophyllo-toxin in mayapple."

A research professor at the North Mississippi Research and Extension Center (NMREC) and Abbasov's advisor, Valtcho Jeliakov said pharmaceutical companies now get most of their mayapple from India. The MSU researchers and colleagues from the University of Mississippi, however, have demonstrated the American mayapple contains the same bioactives as the Indian mayapple and could be developed as a new cash crop.

"We're trying here to shift things so U.S. farmers can benefit from the use of mayapple in pharmaceutical products," Jeliakov said. "We're trying to introduce American mayapple as an alternative to Indian mayapple by providing a better consistency of supply."

Abbasov is researching what conditions are prime for increasing the concentration of the natural anticancer compound podophyllo-toxin in mayapple.

Abbasov is conducting experiments with basil and lemongrass at the NMREC at Verona,

the Delta Research and Extension Center at Stoneville and the South Mississippi Branch Experiment Station at Poplarville. The plants and treatments at each site are identical. It is the location and soil type that vary. His mayapple research is at the NMREC.

"We have a long way to go to take this wild plant and cultivate it," Jeliakov said.

Abbasov's project is part of Jeliakov's larger project funded by the USDA to develop medicinal and aromatic plants as alternative crops for Mississippi growers. Both scientists are studying how plants develop in the Mississippi climate. They are also extracting secondary metabolites, such as essential oils, alkaloids and phenolic compounds. When the plants are harvested, they are analyzed for chemical profiles and evaluated for bioactivity.

"We want to see if medicinal and aromatic plants will grow and perform the same as in other places in the world," Jeliakov said. "Yields, chemical composition and bioactivity may be different based on location."

Abbasov and Jeliakov are working in collaboration with the University of Mississippi's National Center for Natural Products Research.

"Ole Miss has one of the best laboratories for natural chemicals," Abbasov said. "Together, I hope we can get interesting, good results that will benefit the industry."



Shoshana Brackett

Ganisher Abbasov, right, spent much of the summer of 2006 with research professor Valtcho Jeliakov, working with plants that have medicinal potential.

## THE MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE

**Mississippi State**  
UNIVERSITY  
**Extension**  
SERVICE

### MSU-ES: In Partnership with Mississippi

A native of Webster County, Craig Pittman participated in 4-H beef and land judging as a child, but this summer he has learned even more about the wider role of the Extension Service in his county.

An Agricultural Information Science major at Mississippi State University, Pittman interned this summer in the Webster County Extension office as part of a required class.

The mission of Extension includes providing information and educational programs to Mississippians. Pittman has learned more about these services and responsibilities of Extension firsthand this summer.

Pittman has participated in all aspects of the county's Extension Service, including preparing news releases, planning programs, working in the field and organizing the cattlemen's meeting.

Pittman said his activities varied from "4-H to out in the cotton fields to a jewelry making workshop."

Of all his activities, Pittman said, "I like going out in the field the most. I've been farming all my life, so I know more about what's going on out there."

Pittman's love of the outdoors and farming springs from his roots at his family farm. "There's just cows, cotton and a little bit of corn," he said. "My father and I have 2,800 acres of cotton with about 250 head of cattle."

The tug of the land is calling Pittman back after graduation, and he plans to return to farming. "That's all I know how to do," he explained.

Pittman's advisor and Webster County Extension Director Lisa Stewart said, "I try to show interns all aspects of Extension."

This includes program planning, development, implementation and evaluation, among other duties, said Stewart.

"There's so much in Extension we do that people don't recognize," Stewart said. "We help everything flow along. It's grass roots—from the bottom up."

This summer, she said they have been dealing with questions and worries about drought and high heat and the effect on crops.

"He's getting to see the positive side of Extension—we're getting information out," Stewart said.



A Webster County peanut field provided Craig Pittman an opportunity to learn about one of Mississippi's lesser-known crops from County Extension Director Lisa Stewart.

## COLLEGE OF VETERINARY MEDICINE



### Diverse Partnerships Enhance CVM Experiences

Ashley Hill, a second-year vet student at Mississippi State University's College of Veterinary Medicine, spent her summer testing horse skin samples.

Hill was one of 16 students participating in the CVM's student summer research program. The Morris Animal Foundation and the Office of the Vice President for Research at Mississippi State University funded Hill's project.

Dr. Jerald Ainsworth, associate dean of research and graduate studies at the CVM, said the 12-week summer program provides students with valuable insight into the work of scientists.

For the first week, students participate in training on ethics, research career opportunities, and poster and oral presentations. In the other 11 weeks, Ainsworth said, "The students are totally immersed in a research project, either on a new project or part of their advisor's project."

Under the direction of her advisor, Dr. Cyprianna Swiderski, assistant professor in the CVM Clinical Science Department, Hill gathered data to aid research on hyperelastosis cutis (HC), a skin disorder that affects quarter horses and horses with quarter horse lineage.

Hill said the disease is inherited and is prevalent in certain lines of Quarter Horses, particularly cutting horses.

"An innocuous event can cause great damage. Putting a saddle on a sick horse can cause open wounds and sloughing of skin," Hill said.

The disease is usually discovered in 2-year-old foals, mainly because that is the age horses are introduced to tack, Hill said.

This connective tissue disorder is similar to a human disease called "EDSVI," Hill said. "It's so similar it's astounding," she said. Strangely enough, Hill is using the human disease as a model for her study of the disease in horses, when usually the animal model is used for study of humans.

"I've been looking at skin samples and examining their collagen crosslinks to determine if you see the same things as in humans," Hill said.

This summer, Hill traveled twice to Salt Lake City, Utah, for a total of four weeks to work in cooperation with Associated Regional and University Pathologists, Inc. (ARUP Laboratories) at the University of Utah. ARUP does diagnostic testing for humans. Swiderski and Dr. Marzia Pasquali of ARUP and the Departments of Pediatrics and Pathology at U of U have been collaborating to

study HC for two years. Working in Pasquali's labs at ARUP, Hill took small skin samples from healthy and sick horses at the CVM and tested them in Utah.

"I was looking at skin samples of horses we knew to have the disease and that did not have the disease," Hill said. "In the four weeks time, I was able to process and get an amazing amount of data."

Hill's findings have been extremely helpful in narrowing the list of possible genetic defects responsible for HC. Further, her work provides a strong link between HC and human EDSVI. The data gathered will help in the development of better diagnostic testing for HC. "It's nice because it's such a new disease, and anything we can get out there is a great help," she said.

Hill presented her data at a Merck-Merial symposium for veterinary students in summer research programs. The symposium was held at Louisiana State University August 4 and 5.

Dr. Robert Cooper, associate dean of the CVM, and Hill said their goal is to gain understanding of the disease and be able to educate the horse industry further.

"It's great we have so many professors who take us on for the summer research experience and take the time to teach us," Hill said.



Ashley Hill experienced both hands-on work with horses and research in a lab in the CVM's summer research program.