Butterfly Donation Enhances MSU Collection . . . Page 14

Research, Education, and Outreach in the Division of Agriculture, Forestry, and Veterinary Medicine

Mississippi State University
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This colorful South American butterfly, along with many others, now graces the collection at the Mississippi Entomological Museum, courtesy of a generous private collector. (Photo by Kat Lawrence)

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Many people think of winter as a time of rest and rejuvenation. It is a time to visit friends and family during the holidays, and we ring in a new year. Meanwhile, many plants and animals lie dormant—waiting for warmer weather to trigger spring growth.

In contrast, our winter on campus has been full of work and activity. The Kenyan ambassador to the United States, Elkanah Odembo, visited the university in early November to promote philanthropy and using natural resources to enhance quality of life. He encouraged social responsibility, cross-sector partnerships, and policy research, and was able to tour our division during his stay in Starkville.

In December we hosted a delegation of officials from an agricultural university in India. Details on that effort and the resulting partnership that emerged are on pages 4 and 5 of this edition of LandMarks.

February brought Dr. Sonny Ramaswamy, director of the USDA’s National Institute of Food and Agriculture, to campus to discuss the challenges of feeding a rapidly growing world population in times of land and water decline, and climate and capital change. His visit closely coincided with a visit from several scientists and researchers from the United Nations’ Food and Agriculture Organization. They discussed opportunities in a new exchange program designed to send Mississippi State faculty and students abroad to Chile, Cuba, Paraguay, and Peru to help solve food supply and distribution problems in those nations. We were one of only two universities selected to participate in this program.

Regions Bank announced in early February the multi-year $50,000 Regions Bank—DAFVM Superior Faculty Award, which will provide $10,000 annually to recognize high-caliber faculty in our division. My office will supplement that gift with an additional $2,500 annually. These awards will recognize meritorious efforts in teaching, research, service, Extension and outreach, and international programs based on contributions to our overall state and national missions. They will also complement our efforts in training more than 1,800 undergraduate and 900 graduate and professional students each year.

This winter also saw many of our distinguished faculty winning awards and recognition in entomology, economics, aquaculture, plant genetics, crop fertility and management, cotton and rice research, and gender and ethnic diversity. One of our division administrators received a lifetime achievement award for his contributions to scholarship and public service.

At the same time, many of our talented students brought home top honors in entomology, forestry, horticulture, weed science, wildlife and fisheries, and crop fertility. Some of these are noted on pages 28 and 29, while others are detailed online through our MSUcares.com news website.

Closer to home, our Research and Education to Advance Conservation and Habitat (REACH) initiative is making strides sharing science-based best practices with producers and landowners. And here on campus we established a new, 24-acre student farm at the H. H. Laveck Animal Research Center, commonly called the South Farm. Two of our scientists and professors, Billy Kingery and Joe Massey, will guide students there through an innovative small-scale farming class called Hands-On Design and Food Production Practices for Small Farm Sustainability.

I hope you enjoy this edition of LandMarks as much as we look forward to spring.
As Mississippi State focuses on globalization as one of its strategic goals, the university is counting Acharya N. G. Ranga Agricultural University (ANGRAU) in India among its international partners for research and development.

In December, MSU and the prominent Indian university signed an official memorandum of understanding to collaborate on research that will benefit both institutions and their respective constituencies.

Before the signing, MSU President Mark Keenum met with Indian Minister for Agriculture Kanna Lakshminrayana, Agriculture Commissioner K. Madhu Sudhan Rao, and ANGRAU professor Aldas Janaiah, director of the university’s School of Agribusiness Management. All three Indian delegates represent the Indian state of Andhra Pradesh.

During his visit with the Indian delegation, Keenum told the visitors of his “fond memories of my experiences in India” while serving as undersecretary of the U.S. Department of Agriculture.

“I visited with local farmers in their villages and with Indian university and agricultural leaders,” Keenum said. “Those experiences left me eager for Mississippi State University to be more engaged globally and to get more involved with international partners like ANGRAU.

“The world faces the challenges of feeding and clothing a projected 2 billion more people over the next 50 years at a time when 1 billion of the world’s current 7 billion inhabitants
are malnourished,” he added. “Working together, we can begin to address the obvious need for more food and fiber.”

The agreement emphasizes several areas within agriculture, forestry, and veterinary medicine that could provide mutual exchange opportunities for both students and faculty. Aquaculture, veterinary medicine, poultry science, agricultural engineering, innovative watershed protection, and biofuels and biofeedstock are all areas of interest to ANGRAU for mutual ongoing research programs.

MSU Provost Jerry Gilbert told the Indian delegation that he sees many opportunities in a Mississippi State partnership with the Indian land-grant state university.

“Hearing your challenges presents us with great opportunities,” said Gilbert. “We hope the relationship will grow, and based on our prior experiences with Indian students here at MSU, we trust that will be so. We love our Indian students, and they are some of the best students on this campus. We pledge to work closely with you as we mesh these challenges and opportunities.”

Janaiah said his institution has particular interest in partnering with MSU in the area of seed science and technology.

“MSU has been recognized as a global leader in these fields. The state of Mississippi and the Indian state of Andhra Pradesh have many commonalities,” Janaiah said. “Rice production, a strong poultry industry presence, and many other similarities make this partnership one that should be very productive.”

Greg Bohach, MSU vice president for agriculture, forestry, and veterinary medicine, agreed.

“Based on this new partnership and other market-driven factors, we are looking into reinstating MSU’s seed technology program as part of our cooperation with these new partners and as part of changing priorities as the university seeks to increase our participation in global initiatives to battle hunger and food insecurity,” Bohach said.

The agreement also identifies several additional areas of interest, including technology development and transfer, high-performance computing related to plants and health, and interactions with the Institute for Genomics, Biotechnology, and Bioinformatics. The Indian university also is interested in the possibility of using the Thad Cochran Research, Technology, and Economic Development Park as a model for a similar facility in India.

The relationship between MSU and ANGRAU began after a visit by David Shaw, MSU vice president for research and economic development, with the Indian Embassy in Washington, D.C., in September 2012. Minister of Education and Cultural Affairs Bala Bhaskar offered to assist in facilitating collaborations between MSU and institutions in India. Bhaskar’s offer to help resulted in an invitation to a few ANGRAU professors to visit MSU. Their day touring campus and taking part in presentations and discussions helped the two universities identify the possibilities for research collaboration. A delegation of MSU administrators and scientists reciprocated with a recent visit to ANGRAU.

Officials from the Indian delegation said they hope to see the fruits of this collaboration and hope the partnership will yield benefits especially for small farm operations in India. Among the challenges facing Indian farmers are changing patterns in the growing season and water and drainage management.
By Meg Henderson

When most people think of foresters, images of park rangers in green uniforms or lumberjacks armed with chainsaws may come to mind. Certainly, most folks do not immediately picture a software developer working at his computer.

Zack Parisa, a 2006 Mississippi State University graduate, has positioned himself at the forefront of burgeoning technology by developing software to enhance forest management. In 2009, he and co-founder Max Uhlenhuth established SilviaTerra, a Boston-based company that began as a graduate research project at the Yale School of Forestry.

Traditionally, foresters gathered information about a forest using what they call a timber cruise. They hike through the woods with a compass and property map and, using paper and pencil, record information on trees at regular intervals. From the representative data, they are able to assess the resources on the whole property.

New technology is beginning to make the laborious process of timber cruising easier, less expensive, and more time efficient. A growing number of foresters are consequently spending a little more time at the computer and a little less time on the ground.

At Yale, Parisa and his partner developed a program called Timber Scout. It uses satellites to gather data on the number, size, and species of trees on any given property. Parisa said the program makes it possible to create an accurate predictive model for clients based on the land's species and attributes.

After establishing Timber Scout as its “flagship” product, SilviaTerra released a timber-cruising app with the clever name Plot Hound. This app allows foresters to record data on their smartphones rather than with paper and pencil.

The two decided to apply for a patent for their programs after receiving encouragement from professors and professionals in the forest industry. Parisa said he asked himself, “Why not me? Why shouldn’t I grow that niche market?” That decision resulted in starting SilviaTerra, and Parisa has never looked back.

At 29, Parisa is already a successful entrepreneur. He currently works with clients across the U.S. and as far away as South America, helping them manage areas of land larger than 500,000 acres.

“Companies use information to value forest assets and develop management plans to increase future value of forest land, whether it be for a conservation agency that wants to provide a better habitat for salamanders or an industrial owner that wants to increase the value of the timber,” Parisa said.

Despite his enthusiasm for his company and the program he developed, Parisa said he worries about those who fear that this technology might put foresters out of touch with the land they manage. However, he maintains that the new tools will improve land management, and that the results are as accurate as with traditional methods.

Much of the land in the U.S. currently goes unmanaged. But Parisa believes that the data SilviaTerra’s technology provides can help foresters use and grow the resources better than traditional methods alone.

“I’m excited about not only the technology, but also about the type of decision making that the software can enable and positively impact,” Parisa said.

Parisa said he has fond memories of his childhood days spent in the woods near his suburban neighborhood in Huntsville, Ala., and of his later years at MSU.

“The faculty were really interested in what I wanted to do,” Parisa said. “They made sure I got into every class I wanted to sit in on and answered every question.”

The most remarkable quality about his professors at Mississippi State, he recalled, was not found in grand gestures or life-changing moments.

“The heroic thing that these professors do is being there all of the time for their students’ problems, questions, concerns,” Parisa said.

One of these seemingly small acts resulted in an extraordinary opportunity for him. Aware of his interest in international forestry, a faculty member informed Parisa of an opportunity to study abroad and intern for a company in Brazil.

“That changed me,” Parisa said. “It’s simple, a forwarded e-mail, but I’m friends still with my adviser and several professors and correspond with them regularly.”

According to Andrew Ezell, head of the MSU forestry department, Parisa would often ask questions after his Practices of Silviculture class—not because he did not understand the material, but because he wanted to learn about its practical applications and relate it to his personal experiences.

“He’s going to be involved,” Ezell said. “Whatever he’s involved with, he’s going to be a leader.”

Parisa is well on his way to doing just that. SilviaTerra is not just a job for him, it is a passion.

“You don’t ever put your work away; there’s no five o’clock and you go home and not think about it,” he said. “It’s what you dream about, it’s what you relate everything to.”

Parisa’s combination of creativity, dedication, and love of his profession recently earned him recognition in his industry, and in news outlets such as Bloomberg and Forbes.
Several agencies joined forces in Wiggins and Verona to help train first responders to rescue large animals safely after a disaster or accident.

“Mississippi is a rural and agricultural state, but many of our first responders have no experience with horses, cattle, and other large animals,” said Elmo Collum, disaster preparedness coordinator for the Mississippi State University Extension Service. “Over the years that we have conducted these trainings, we have discovered that even people with large-animal experience can learn from the classes.”

Collum said, in addition to the classroom material and hands-on exercises, participants, such as fire fighters and veterinarians, benefit from meeting others in their communities who might be needed during an incident.

Dr. Rebecca Gimenez of Georgia was one of the two primary instructors for the Technical Large Animal Emergency Response courses. She and Dr. Tomas Gimenez, a retired professor from South Carolina, teach the mental, psychological, and physical considerations of rescuing large animals.

“We want participants to learn to minimize damage to the animals involved in disasters or accidents and to be aware of human safety concerns as well,” she said. “Responders always need to give the animal room to maneuver and avoid putting themselves or others in vulnerable places.”

Gimenez instructed participants to focus their efforts on the animal’s torso, rather than on the fragile extremities, such as legs, neck, or head. She explained that most rescue trucks have equipment that can be adapted to help a trapped or downed animal.

“We can’t prepare for every disaster, but we can prepare to be prepared,” she said. “This training offers first responders the opportunity to prepare to protect not only humans, but also their animals. It takes good teamwork among responding agencies.”

Dr. Carla Huston is an associate professor with the MSU College of Veterinary Medicine and a member of the CVM Disaster Response Team. She said cattle are involved in many of the animal incidents that first responders manage.

“Overturned livestock trailers are more common in Mississippi than most people realize,” she said. “We are a major corridor for transporting cattle to the Midwest and South Plains from Florida, Georgia, and other states.”

Huston told participants about the Mississippi Animal Response Team (MART), which is overseen by the Mississippi Board of Animal Health. MART is activated whenever natural or man-made animal disasters occur in the state and assistance is requested through the appropriate agencies. MART members include first responders, veterinarians, and other volunteers from throughout the state.

The Mississippi Office of Homeland Security funded the three-day classes in Stone and Lee counties. Cosponsors included the MSU Extension Service, MSU College of Veterinary Medicine, and the Mississippi Board of Animal Health.
The concept of the world as one global community is more than a philosophy or political slogan. Across the world, scientists, physicians, veterinarians, and other professionals are working together to address medical challenges facing human, animal, and environmental health personnel as part of the One Health Initiative.

At the Mississippi State University College of Veterinary Medicine, Dr. Keun Seok Seo’s research aligns with the principles of the One Health Initiative. He is studying the bacterium *Staphylococcus aureus* (staph).

“*Staphylococcus aureus* is a zoonotic pathogen that causes diseases in humans and animals,” said Seo, an assistant research professor in the Department of Basic Sciences. “My
career started in a veterinary school, so I began with veterinary diseases. Bovine mastitis is similar to human mastitis. It is a highly invasive disease, and, once the bacterium penetrates the body, it can go to any part of the body. Human and bovine strains of the bacterium share similar virulence factors.”

Seo said *Staphylococcus aureus* is a ubiquitous bacterium.

“Staph can be anywhere,” he said. “It’s on every warm-blooded animal’s skin. At least 70 percent of people — even if healthy — still harbor staph. This bacterium lives with the host, and, one day, the immunological balance breaks and you have big trouble. I use the term ‘invasive disease.’ You don’t die from staph in a paper cut because it’s a superficial wound, but once staph invades the blood stream, tissue, organs, bones, or lungs, it’s a big problem because the immune system may not be able to overcome it and there are few antibiotics to treat it.”

Seo’s work shows great potential for developing strategies to battle the bacterium that costs $2 billion annually in the U.S. dairy industry through losses to mastitis and $10 billion annually in human health-care costs. Early in his career, Seo identified the role of the staphylococcal enterotoxin.

“I found that the staphylococcal enterotoxin induces regulatory T cells that suppress the immune system and thereby increases susceptibility to infections,” Seo said.

One of Seo’s strategies for control has been to develop vaccines against the staphylococcal enterotoxin to neutralize its immunosuppressive effects.

The staph organism is very powerful, and its toxic properties must be removed before an animal vaccine can be developed. Seo has found a way to do this and now hopes to develop a vaccine that will generate an antibody in cattle to fight off the dangerous toxin and protect them from the disease. Seo’s progress is so significant that he received funding from the government of South Korea.

Seo’s work with bovine mastitis and *Staphylococcus aureus* led him to a new line of inquiry that would tie the two together in a way that could benefit both animal and human health.

Traditionally, scientists have used mice and rabbits as animal models for studying staph infections, particularly pneumonia. However, Seo believed a larger mammal with a proven sensitivity to the bacterium might offer an improved animal model. He collaborated with Drs. Cyprrianna Swiderski and Timothy Morgan, both CVM associate professors, to test his hypothesis that cattle could serve as effective animal models for studying staphylococcal pneumonia. The result of their first experiment showed Seo’s hypothesis was correct.

“Humans are very susceptible to staph, and this study showed that the bovine response is superior to any other animal model in terms of mimicking human sensitivity,” he said.

Dr. Stephen Pruett, head of the CVM Department of Basic Sciences, said Seo’s results are exciting.

“Dr. Seo’s work is an excellent illustration of the benefits that can be derived from the One Health concept,” Pruett said. “One Health emphasizes the common features in veterinary medicine and human medicine that allow use of research in one to benefit the other. One of Dr. Seo’s research goals is to develop a vaccine to prevent *Staphylococcus aureus* infections in cattle, and achieving this goal will also provide important basic information that can be applied to developing a similar vaccine for humans.”

Proving the viability of a new animal model for his studies offers increased opportunities for expanding his research and improving the potential for human and animal health benefits. Yet with greater opportunity comes the need for more help and funding.

One option may bring Seo full circle. His research history stretches back to his doctoral thesis at the University of Idaho under the supervision of Dr. Greg Bohach, who is now the vice president of the MSU Division of Agriculture, Forestry, and Veterinary Medicine. Seo came to the United States as part of a collaborative program between Seoul National University and the University of Idaho.

Recently, a new memorandum of understanding was established between MSU and South Korea’s Seoul National University to facilitate exchange programs for students, faculty, and researchers. Currently, two visiting scholars from CVM-SNU are working with Seo on his *Staphylococcus aureus* research. He hopes more will follow.

Bohach said basic science research is important for the university.

“Some of the most important discoveries in medicine and agriculture came about from basic research,” he said. “By doing basic work, we’ve had discoveries that can help us in human and animal medicine. I always thought the right balance between basic and applied research is important — not just for an individual scientist but for a university in general. I think that our public expects us to do things that benefit society.”
Newton County sixth-graders recently got a close look at some of Mississippi’s wildlife.

Mississippi State University’s Coastal Plain Branch Experiment Station held its fourth annual Wildlife Youth Day in November. Students rotated through four educational stations, including Mississippi mammals, a forestry-themed obstacle course, archery technique and safety, and Mississippi reptiles and amphibians. The students viewed live and preserved mammals, reptiles, and amphibians. They also watched a bird dog training demonstration.

The event aims to link the students’ classroom studies to Mississippi’s natural resources. Event coordinator Adam Rohnke said it helps move students from a two-dimensional textbook or photograph to a three-dimensional sensory experience.

“Science teachers are covering many of the topics we addressed here today. With these activities, we are able to bring those concepts off the pages of the book and into real life for the students,” said Rohnke, an Extension associate with the MSU College of Forest Resources Department of Wildlife, Fisheries, and Aquaculture. “It also allows us to partner with our local schools and bring the university’s resources and expertise to the table to enhance the local curriculum.”

Sharon Hurst, a science and social studies teacher at Newton Middle School, said the field day is a great learning experience for her students.

“The material that has been covered here today goes right along with our curriculum,” said Hurst. “Right now we are studying Newton’s laws of motion and different types of animals. There is no way I would be able to afford all of these visuals for my students. It really helps students when the concepts we learn about in books can be experienced.”

Leslie Burger, conservation educator in the Department of Wildlife, Fisheries, and Aquaculture, presented information on Mississippi mammals. She said the event gives students a personal connection to nature.

“The field day is a chance to reinforce what teachers have been teaching in the classroom,” said Burger, who is also an Extension associate with the MSU Forest and Wildlife Research Center. “But actually seeing the animals or representations of animals makes it relevant to them. It is also an opportunity to relate to the subject on an emotional level, and, when that happens, people feel more connected to the subject. Hopefully that fosters the desire to know more and more.”
Private Butterfly Donation Enhances MSU Collection

By Bonnie Coblentz

A gift of butterflies has expanded the collection at the Mississippi Entomological Museum, the result of a life passionately dedicated to collecting the beautiful and fragile specimens.

Ruth Williams of Hattiesburg, widow of James J. Williams, donated her late husband’s collection of tropical South American butterflies to Mississippi State University in November. There are about 1,300 labeled and identified specimens displayed in 46 cases.

JoVonn Hill, a research associate with the Mississippi Agricultural and Forestry Experiment Station, said the donation includes some high-quality specimens, mostly from Ecuador and a few from Mexico.

“Once they have been systematically organized into our collection, this donation will expand our collection by adding new species we did not previously have,” Hill said. “It is difficult to obtain permits to collect in South America anymore.”

Williams said she and her husband collected most of the butterflies on summer breaks from their jobs as teachers. He was a college and high school advanced-placement biology teacher in Chesterfield County, Va. She taught both high school and college English.

“We went to Ecuador every summer from 1994 to 2000,” Williams said. “Jim was working with a professor at the Catholic University in Quito, Ecuador, who would sponsor him to work in the country. For seven summers, we went to different places. We only went to one place twice.”

Many of these locations were remote and accessible only by perilous bus trips. One expedition required the Williamses to ride mules on a six-and-a-half-hour trek.

The couple stayed in Ecuador for two months at a time in the summers doing nothing but collecting. Living conditions were rustic, and they would bring freeze-dried dinners and a portable cooktop for areas where other meals were not readily available.

“We didn’t think about teaching, didn’t think about the United States. We just thought about collecting. He collected and did the work of setting them himself and identifying them. I was his ‘my girl Friday.’ Occasionally I used his extra net, and I would play at collecting. I got a couple by mistake,” she joked.

Williams said her husband was fanatical about butterflies from childhood. In college, he collected on his own in the United States and Mexico. Although her late husband had the lifelong passion for butterflies, Williams said she came to love them, too, and enjoyed the summers spent chasing butterflies.

“In college and high school, I hated biology. He opened up a whole new world to me, and I totally enjoyed it,” she said.

Hill said Jim Williams’s work was done with skill.

“Lepidoptera, which are the moth and butterfly species, aren’t the easiest specimens to prepare,” Hill said. “It takes a lot of practice and is a very tedious thing to do. We have found Jim’s specimens to be well prepared and preserved.”

Williams said she is proud of her late husband’s collection.

“When he was collecting the butterflies, he would carefully fold them and put them in a special envelope. Once we returned to the United States, he would spend all his spare time during the school year labeling and pinning his specimens,” she said. “All his labels are hand-printed in tiny calligraphy, and he could set butterflies without touching a scale.”

Williams said she and her husband chose to donate the collection to MSU after they got a favorable impression of faculty in the Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology.

“They were really interested in encouraging students,” she said. “He was impressed by their open and friendly attitude. They made him feel good about his science and his work.”

Hill said the collection will be an asset to the Mississippi Entomological Museum housed at MSU.

“These tropical butterflies are all pinned, and most are displayed with the country of origin, province, dates, names, and sometimes other information,” Hill said. “The value of this collection lies in the scientific information that comes with it, the value of the data. We can use this information to document many things about the species, such as its habitat, range, and what time of year it is moving about.”
MSU PROJECT
Saves State Money, Effort

By Linda Breazeale

An advanced database-training project conducted by the Mississippi State University Extension Service is saving the state millions of dollars, improving skills, and making jobs easier.

The Geospatial Education and Outreach Project began working with local and state government agencies across Mississippi in June 2006. By November 2012, more than 2,600 people from more than 60 counties learned the concepts behind the mapping software in about 260 workshops. The GEO Project software combines geographic information with other features in an area, such as data on utilities, property lines, and roads.

Jim Davis of Olive Branch, an engineering technician with the Mississippi Department of Transportation, took part in a recent class. He learned different ways to map department data including parcel information, sign inventory, and road and drainage areas. “Learning how to use the new software makes my job easier,” he said. “I can use data from multiple sources, reference that data to its geospatial location, and use that data alongside my local data. This enriches the information we are able to provide to the department. I have also gained great contacts from networking at the GEO Project courses.”

Scott Samson, professor with the Extension Service and the Geosystem Research Institute at MSU, developed the GEO Project. Having in-state training saves Mississippi about $5.5 million compared to the cost if workshop participants had to go out of state to take the same training.

Samson said the rescue and recovery efforts associated with Hurricane Katrina introduced Mississippi to the widespread use of geographic information systems, or GIS.

“In response to that disaster and in an attempt to modernize record management in municipal and county government agencies, Mississippi was able to secure funds to train government employees on GIS technologies and assist them with the implementation of GIS in the workplace,” he said.

GEO Project leaders offer several workshops statewide each year at various locations. Two portable computer labs permit the delivery of concurrent workshops. Mississippi municipal, county, and state employees receive the training at no cost.

Samson said ESRI Inc., the largest GIS software vendor in the world, has identified GEO Project as the largest outreach effort of its kind in the United States.

“Two-day courses retail at $1,010 and three-day courses at $1,515 if taken from ESRI personnel. Course topics range from introduction to GIS to advanced server and database concepts,” he said. “Content is technical and intensive. All courses provide hands-on exercises. Instructional materials and travel expenses are covered through various sources of external funding.”

Unlike many workshop developers, GEO Project personnel understand that sitting in the classroom to learn about GIS is very different from implementing GIS in the workplace.

The project provides technical support to state and local government agencies to help in making the transition to the office. Applicants to attend workshops include local tax assessors, emergency management workers, and people involved in agriculture.

For additional information about the GEO Project, contact Samson at sssamson@gri.msstate.edu.
No-till farming, strip-till farming, crop rotation, and cover crops have grown in popularity as Mississippi farmers face the challenge of conserving nutrient-rich topsoil while improving their bottom lines.

“I estimate that around 20 percent of Mississippi farmers practice no-till farming. There are probably many more who use some degree of reduced tillage,” said Ernie Flint, an agronomist with the Mississippi State University Extension Service who has more than 40 years’ experience in the field.

Conservation methods are often more difficult to implement in Mississippi than in some other parts of the country, such as the Midwest, because factors including weather, topography, and soil types make soil especially prone to erosion.

“We don’t have the long-term freezes in winter that help hold soil in place and preserve organic matter,” Flint said.

Rainwater runoff easily carries nutrients and cultivated topsoil off sloping land, and some soil types are difficult to rebuild.

“Erosion potential in central Mississippi is three times that of central Ohio because of the amount and intensity of rainfall,” said Glover Triplett, a research professor in the MSU Department of Plant and Soil Sciences and the Mississippi Agricultural and Forestry Experiment Station. “If we have a system that keeps the soil covered with mulch and undisturbed, we can reduce soil loss to levels that will permit sustainable cropping.”

Reduced soil disturbance and rainwater runoff management slow erosion and usually lead to increased yields after a two- to three-year period.

“I’m seeing people who are new to farming or have begun farming family land after 30 to 50 years of dormancy start by planting seed into unplowed land. And they’re getting high yields, usually beating the state averages,” Flint said.

Strides in herbicide development have made it possible to control weeds without tillage, and advances in equipment have made it possible to plant into untilled ground. But the real game changer is computer technology. For example, global positioning systems allow for precise planting, fertilizer application, and spraying.

“A second- and third-year corn crop likely will do better if the seed are not planted in the exact same spot,” Flint said. “By using a GPS, a farmer can move the planter as little as a few inches on either side of the earlier planting. There is no way this could be done accurately without GPS, even by the best equipment operator.”

In addition to saving soil, conservation practices can save money. Farmers who use one or more of these methods reduce the number of trips they make over the field. Fewer trips result in more planted acres with less labor, and it saves money on equipment, fuel, labor, fertilizers, chemicals, and other inputs required.

As agriculture faces the challenge of feeding more than 9 billion mouths worldwide by 2050, a focus on sustainable cropping is increasingly important.

“What are future generations going to live on if we exhaust the land to the point it will not produce? They will starve. We just can’t allow that to happen,” Flint said.
Some people just sit on the edge of the pool and dangle their feet in the water, while others jump right in. When faced with a major career choice, Cassandra Weston took the plunge.

Weston received her bachelor’s in business management in 2007 at Mississippi State and worked in the university’s Academic Advising Center while trying to decide what path her career would ultimately take.

“I thought I would find something in the business world, but the people who know me best, my friends and family, kept saying I needed to follow my heart,” she said.

Before she left home to attend MSU, Weston’s effervescent personality and a knack for never meeting a stranger had already expanded her world beyond her tiny hometown of Cascilla on the edge of the Mississippi Delta in Tallahatchie County.

The three big influences on her early life were her family, church, and the MSU Extension Service’s 4-H youth development program.

“I joined 4-H in the third grade, and 4-H was an important part of my life as I grew up,” Weston said. “Participation in a variety of 4-H programs helped me meet new people, adapt to different situations, and prepare for the future.”

She took every opportunity to learn and to serve in 4-H, said Sherry Radcliff, the Extension 4-H agent for Tallahatchie County when Weston was a member.
“Cassandra was willing to do whatever needed doing,” Radcliff said. “She always expected a lot of herself and her peers.”

Weston’s future changed in 2010 when she saw a notice announcing a job opening for a 4-H agent at the University of Florida.

“I wasn’t sure at first if I should apply, but everyone who knew my love for 4-H encouraged me to apply,” Weston said. “I had been serving as a 4-H volunteer in Lowndes County, which made me sure that I wanted a 4-H career.”

She did apply and was interviewed on campus in Gainesville and hired to serve as an Extension 4-H agent in Dade County starting in January 2011.

Her parents, L.Q. and Wilma Weston, were concerned about the distance and the possible challenges of their daughter’s new job, but they knew she was well prepared.

“We know she loves working with the children and that the Lord will provide her the strength to meet any situation,” her mother said.

Dade County, which includes Miami, has a population of 2.5 million and more than 100 schools, making it the fourth largest school district in the nation. While the 4-H mission of providing hands-on learning activities in the areas of science, citizenship, and healthy living for young people ages 9 through 19 is the same nationwide, approaches to programs are tailored to meet the needs of rural, urban, or suburban environments.

Weston also had to do some adapting.

“I knew about the large Latin population in south Florida, but what surprised me the most is that it’s not just the Latin culture here,” she said. “There are large numbers of Jamaicans, Haitians, and Asians. In fact, there are not too many cultures that you can’t find in Miami.”

While she misses her family and friends in Mississippi, Weston has made new friends and even been “adopted” by some.

“A Jamaican family in my church has adopted me,” she said. “There’s also my work family and my family of friends.”

At Mississippi State, Weston was a member of MSU Roadrunners, a group of students who welcome new and prospective students to campus, conduct guided tours, and provide information on daily life on campus.

She continues to be an ambassador for MSU and her home state. Not long after starting her new job in Miami, Weston was shopping for a special cake for a friend’s party. She found a small bakery that could make just what she was looking for and was quickly engaged in conversation with the owner, who is from Cuba.

“When I told him I am from Mississippi, he said he didn’t like Mississippi because he had a friend who was stationed there while in the military during the 1960s and didn’t like it,” she said. “I asked him how many people he knows from Mississippi, and his answer was ‘none.’ I told him, ‘well now you know me, and I’ll change your opinion of Mississippi.’”

She did, and now his bakery is her source anytime an occasion calls for something special.

Her tenacity and natural Southern charm also serve her well on the job, especially when working with teenagers.

“We train teens to work with younger 4-H’ers because it’s easier for them to reach the younger kids,” she said. “When I do a program, I start by just sitting and talking with the teenagers. It’s easier for them to warm up to you when you find common interests, like music.”

One of the big differences Weston has found between 4-H in Mississippi and in Dade County is livestock.

“There is a lot of 4-H participation in livestock shows in Mississippi, and there are some horse clubs here but not a lot,” she said. “Dade County is large, however, and extends well beyond Miami, so there are rural areas with a lot of fruit and other horticulture crops.”

Community gardens and crafts are popular parts of the 4-H program in the county, and members exhibit their work at the annual Miami/Dade Fair, which is larger than many state fairs.

“Our members have 2,000 to 3,000 exhibits at the fair each year,” Weston said.

The biggest part of her job, however, is providing enrichment activities in the schools.

“We provide programs on healthy living, money management, nutrition, public speaking, and other types of activities that help kids with personal growth and to become more involved in their communities,” she said. “Kids want to express themselves, whether it’s through public speaking, art, or other skills. That’s a big part of what 4-H provides.”

Weston is still part of the Mississippi State University family. She is working on her master’s degree in agriculture and Extension education. Her formal education and what she is learning as part of one of the world’s most culturally diverse communities are helping her prepare for a lifelong career.

“When you live and work in a place like Miami, you quickly realize that it’s not all glitz and glamour,” she said. “The people are real, and their problems and ambitions are the same as anywhere else. Once you realize that and start to build relationships, you begin to feel at home.”
Students and Teachers Say “YES!” to Hands-On Learning

By Meg Henderson • All Photos Submitted

Fourth-graders sit at their desks in a classroom at Henderson Ward Stewart Intermediate School in Starkville, waiting to eat rock-shaped concoctions constructed from various candies. Nothing here is out of the ordinary, except that the students made these snacks. And they are not just sugary treats; they are models of sedimentary, igneous, and metamorphic rocks, and this culinary activity has taught the students a lesson in geosciences.

Jessica Tegt, Mississippi State University assistant Extension professor, teaches lessons like these to fourth- and fifth-grade students as part of the Youth Environmental Science, or YES!, program.

The program, a partnership between the MSU Forest and Wildlife Research Center, Mississippi University for Women, and Starkville School District, immerses students in natural resource-based science for an entire week. Each fourth- and fifth-grade class in the district has participated, and a total of 1,700 students have gone through the program.

The week begins with a field trip either to Noxubee Refuge or Plymouth Bluff and continues with interactive lessons in several subjects, including aquatic and forest ecology, weather and climate, and humans and the environment. The lessons are aligned with grade-level state and national science curriculum standards.

“The lessons are multidisciplinary as well,” said Leslie Burger, Extension associate for conservation education and YES! codirector.

“For instance,” Tegt said, “when the students dissect owl pellets, they have a reading comprehension activity. Then they draw and reassemble their owl pellet, and they have to talk about its place in nature.”

Tegt and Burger created YES! two years ago to bring natural resource science programs to more students. MSU hired Burger to lead wildlife and natural science summer camps, and Tegt had been running an after-school science club at Henderson Ward Stewart for five years. However, a limited number of students were able to participate in these programs.

While Tegt and Burger initiated the idea to bring a supplemental science program into regular class-
rooms, administrators and teachers also recognized the need for such a course.

“The school district was trying to find a way to expand the science club to reach more students, so children who have barriers to participating in extracurricular activities could experience science hands-on,” Tegt said.

In a survey conducted by Tegt and Burger, 97 percent of teachers responded that they wanted their students to get more science experience.

“Unfortunately, science gets pushed to the side because math, reading, and language arts are considered more important, so this program gives them an opportunity to do a lot of things they don’t get to do in the classroom,” said Shalisha Robinson, who has taught fourth grade at Henderson Ward Stewart for five years.

Besides the limited time teachers can devote to science, they often lack the subject-specific background necessary to teach certain topics in depth.

“There are teachers, who by no fault of their own, are in the classroom and are asked to teach astronomy, geology, earth science, subjects where they haven’t had extensive training,” said Kenny Langley, project coordinator for the Science Enrichment Program at MUW.

Langley instructs YES! participants in aquatic ecology when they visit Plymouth Bluff.

“The program gives me a little background in some of the science we could cover in the classroom,” Robinson added. “It helps me feel more comfortable about teaching those things.”

Among the greatest advantages the program provides students is addressing their fear of the outdoors through learning about the ecosystems in their own backyards.

“Kids today spend more time indoors than ever,” Burger said. “There’s a lot of fear: fear of bugs, dirt and germs, and wild animals. They will not be interested in conserving what they’re afraid of. We want to rebuild those connections people have lost with the environment, both their understanding of it and their affinity for it.”

One of the benchmarks of a successful educational program is how well students retain what they learn. While Tegt and Burger are still in the process of evaluating the data from pre- and post-program tests they give students, they have a great deal of anecdotal evidence that the lessons stick.

Perhaps the greatest advantage of YES! is the difference it makes in how children experience learning.

Austin Smith, a 10-year-old fifth-grader, recalled an experiment his class did earlier in the week. He particularly enjoyed the hands-on demonstration of air pressure changes at different altitudes using water bottles, balloons, and vanilla wafers.

Lessons like these are ones that students remember because they teach complex scientific concepts in a way that is hands-on and kid-friendly. Since YES! has seen so much success in Starkville, Tegt and Burger said they hope to expand the program.

“Right now, we’re applying for grants and are hoping to expand to other school districts throughout the state,” Tegt said.

“Kids today spend more time indoors than ever. There’s a lot of fear: fear of bugs, dirt and germs, and wild animals. They will not be interested in conserving what they’re afraid of. We want to rebuild those connections people have lost with the environment, both their understanding of it and their affinity for it.”

Leslie Burger
FOCUS

Results from a Mississippi State University study of mallard ducks in the state’s south Delta revealed information that could help shape conservation and habitat management programs.

For several years, Brian Davis, assistant professor in the MSU Department of Wildlife, Fisheries, and Aquaculture and researcher in the MSU Forest and Wildlife Research Center, has studied how mallards use the overall landscape and how the landscape affects their survival.

“Ultimately, we want to know how mallard survival is influenced by its use of several habitats of the Delta,” Davis said. “Survival of birds in relation to hunting seasons is also important.”
Studying mallards over time has yielded a lot of information. Davis said the birds’ movements, habitat use, and survival reflect landscape quality.

“We can learn more about survival by examining habitat use among ducks of different ages and body masses,” he said.

To determine habitat use and survival rates, Davis and his team captured and equipped a sample of 126 female mallards with backpack-style, very-high-frequency radio transmitters. Researchers used the transmitters to track the birds’ locations daily and note mortalities.

“The problem is that you have to be in close enough proximity — two miles or less — to receive a signal to pinpoint where the bird is,” said Joseph Lancaster, a wildlife, fisheries, and aquaculture graduate student involved in the study.

To track the ducks, the researchers drove around in trucks and chartered a fixed-wing airplane, each fitted with special antennae.

Data from the 2010–12 study showed an overall winter survival rate of 76 percent. The highest daily survival rate occurred in moist-soil habitats, such as shallowly flooded wetlands of annual grasses and weeds, followed by agricultural, forested, and permanent water habitats.

Hunting impacted mallard survival but not as much as researchers expected.

“We saw a higher percentage of nonhunting mortalities than hunting mortalities,” Lancaster said.

Davis said shooting a radio-marked duck is not illegal. He invited hunters to contact the researchers to add to the study’s data, which can benefit them as it is translated into land management strategies that lure more ducks to the Delta.

“The data might reveal where conservation programs should be focused,” Davis said. “For private landowners, we can help them with habitat management that could attract more mallards to their land.”

Davis and Lancaster plan to continue their study through 2014.

“I’m staying on to do a Ph.D. with Dr. Davis, and we’re expanding the study northward,” Lancaster said. “The first part focused on an area south of Highway 82. We’re going to expand to the north part of the Delta where there’s a higher concentration of mallards.”

Davis said the last study of this kind in Mississippi was in the 1980s, and ongoing studies are needed.

“As the landscape changes, we need to revisit the same questions,” he said. “Survival rates may be different in subsequent eras, as farming and conservation practices change. When government programs, such as reforestation incentives for landowners, come and go, or when soybeans come and go, it modifies the landscape.”

From November to early March, mallards and other waterfowl make the Mississippi Delta their seasonal home. The Mississippi Alluvial Valley extends southward along the Mississippi River from the Bootheel of Missouri through eastern Louisiana and annually supports about 40 percent of the Mississippi flyway mallard population during the winter.

The study was funded by the Mississippi Department of Wildlife, Fisheries, and Parks; the Natural Resources Conservation Service through a Cooperative Ecosystem Study Unit agreement with MSU (Migratory Bird Habitat Initiative); and the Forest and Wildlife Research Center.

Alan Afton, assistant leader for the U.S. Geological Survey, Louisiana Cooperative Fish and Wildlife Research Unit; Ed Penny, Wildlife Bureau director with the Department of Wildlife, Fisheries, and Parks; and Rick Kaminski, the James C. Kennedy Endowed Chair for Waterfowl and Wetland Conservation at the College of Forest Resources, collaborated on the project.

“Ultimately, we want to know how mallard survival is influenced by its use of several habitats of the Delta. Survival of birds in relation to hunting seasons is also important.”

Brian Davis
Bats, an organic method of pest control, may one day become rare in the United States and Canada.

The primary predators of night-flying insects, bats reduce the need for chemical pesticides and save the agricultural industry an estimated $3 billion per year in pest control costs. But bat populations across the eastern United States are decreasing at alarming rates because of a fungus thought to be imported from Europe.

“Bats in 19 states and four Canadian provinces are dying at high rates because of a cold-loving fungus, Geomyces destructans,” said Nicole Hodges, research associate with the Mississippi State University Forest and Wildlife Research Center. “The fungus results in a disease called white-nose syndrome, and it’s decimating our bat colonies.”

She said the fungus has been found in Alabama but has not yet been discovered in Mississippi.

Because the fungus will grow only between 33 and 59 degrees Fahrenheit, some scientists think that Mississippi is not in danger, Hodges said.

“I feel that the reason we have not seen white-nose syndrome in Mississippi yet is because our temperatures are not in that range for an extended period of time,” Hodges said. “But I have recorded temperatures in culverts, where bats often roost, that are within the range hospitable to the fungus.”

The state’s agricultural industry is expected to feel the financial impact if bat populations decrease.

“I imagine it would have a huge impact if growers in the Delta area had to compensate for the loss of pest control provided by bats,” said Kathy Shelton, a biologist with the Mississippi Department of Wildlife, Fisheries, and Parks.

Hodges and Shelton work with scientists across the state to monitor bat populations and watch for any sign that the fungus causing white-nose syndrome has moved into the state. Their work takes them to some unusual places.

Mississippi has a limited number of caves but does have many bridges and drainage culverts, where bats can roost during the day. From the outside, these culverts often resemble naturally occurring caves.

Undisturbed caves and culverts are especially important to bats when it gets cold because they go into a deep sleep or winter dormancy similar to hibernation. They cannot wake quickly, which puts them at risk of falling when disturbed.

Hodges said veterinarians and biologists are still trying to determine exactly how bats are affected by the white, powdery fungus that grows on their faces, ears, and wings.

“It is suspected that the fungus causes discomfort to the bats, almost like it makes them itch,” Hodges said.

Bats with the fungus wake up from winter dormancy, which causes them to exhaust energy reserves that are critical for overwinter survival.
"The bats basically end up starving to death," she said.

The fungus was first documented in caves in New York in 2006, but it has spread rapidly. The mortality rate in infected colonies is 90 to 95 percent. Some studies report mortality rates as high as 100 percent in localized populations of bats.

Hodges said this situation could reduce numbers of endangered bat species, such as Indiana and Gray bats, to levels that may lead to extinction.

The disease is not dangerous to humans. Bats contract the disease from other bats or the environment. Currently, there are no known methods of controlling the fungus without harming the entire cave ecosystem.

As part of efforts to protect bats, Hodges stressed the need for people to move beyond the myths and misconceptions about bats.

"Mississippi doesn’t have vampire bats. The bats here eat insects. In many places, they pollinate fruits such as bananas, mangoes, and guavas. They also disperse seeds," Hodges said. "Bats are an important part of the ecosystem."

Shelton said it is extremely important that people stay out of drainage culverts.

“They’re unsafe places to play, and people will disturb roosting bats, especially those in winter dormancy, which can lead to unusually high mortality in the bat colony," Shelton said. “We encourage people to appreciate bats from afar. They’re living animals, not toys for target practice.”

For more information on white-nose syndrome, visit http://www.whitenosessyndrome.org.

"Bats in 19 states and four Canadian provinces are dying at high rates because of a cold-loving fungus, Geomyces destructans. The fungus results in a disease called white-nose syndrome, and it’s decimating our bat colonies."

Nicole Hodges
Artisans and historians of the Piney Woods region took visitors on a trip back to their roots in November.

They demonstrated old-time skills and crafts, such as blacksmithing, basket making, quilting, spinning, and woodcarving, at the Piney Woods Heritage Festival at Mississippi State University’s Crosby Arboretum in Picayune.

“We had a quality group of artisans and historians,” said Pat Drackett, Crosby Arboretum director. “This region has incredible history and culture, and we are excited that they wanted to share their knowledge so that the history of our region is not lost.”

The festival was open exclusively to school groups on November 17. Scott Langlois, a research associate at the MSU South Mississippi Branch Experiment Station, pressed and cooked sugar cane and talked to students about heritage sugar cane breeds. This was the first time the festival had a sugar cane exhibit to demonstrate the pressing and cooking process for making syrup.

Festivalgoers enjoyed live music by Hazel and the Delta Ramblers, the Pearl Strings Dulcimer Group, The Jordan River Band, and Indian Summer on November 18.

Exhibitors have a passion for their skill and want to ensure others have an appreciation for it.

Chuck Averett, a fourth-generation blacksmith and exhibitor, said blacksmithing is more than a hobby for him.

“My grandfather made his living doing this, and so did my father through the mid-1980s,” Averett said. “I am interested in the tradition, how things were done 100 years ago. My shop at home is a modern building, but when you walk inside, it’s like stepping back in time. I make all my own tools, besides hammers. But eventually I’ll make those as well.”

Other exhibitors shared information about the region’s history.

Bob Rouse is one of few producers who raise purebred Pineywoods cattle, a versatile, hardy breed brought to the Americas by the Spanish beginning in the 1500s. Early inhabitants used them for timber harvesting, crop production, beef production, and milk production.

“My grandfather owned Pineywoods cattle,” said Rouse, who lives on property near Carriere that was homesteaded by his great-grandparents. “I thought the breed was extinct because of cross-breeding. When I found out there were less than 200 left, I wanted to help make sure they don’t die out.

“To me it’s a sad thing that parts of our heritage are in danger of being lost. My grandfather took pride in his family’s ability to be self-sufficient and live off the land. I feel a connection to that, and cherish knowing that I am part of that,” Rouse added.

John Houston, a woodcarver, said skills such as his have become increasingly rare.

“The younger generation has become accustomed to a fast pace, and this takes time,” Houston said. “There is no necessity for this skill anymore. People used to make their own utensils. Hunters made their own decoys. Now it’s more of a hobby for people.”

Houston carves and paints his items, many of which are made from water tupelo wood.

“The time it takes to complete a piece depends on its size and the amount of detail it has,” said Houston, who also teaches a class on woodworking. “Smaller pieces will take a weekend to carve, but larger pieces like a decorative decoy will take about 400 hours to carve. Painting them will take an equal amount of time. It will take seven to eight processes to get the correct detail on a bird’s feather.”

Drackett said the two-day festival drew approximately 400 students, teachers, and family members.

“We don’t have a huge crowd, but that just makes it that much more special for those who attend,” she said. “Visitors have the chance to interact with our exhibitors one-on-one.”
Warm-hearted Mississippians often turn their attention to their furry and feathered neighbors when temperatures get cold, putting out feeders to care for them over the winter.

Birds are the most commonly fed wildlife, and stores stock a variety of feeders, seed mixes, and houses for them.

Leslie Burger, an Extension conservation educator in the Mississippi State University Department of Wildlife, Fisheries, and Aquaculture, said bird feeders can provide educational entertainment for people and supplemental food for birds. To maximize the number of visiting birds, Burger said to use different feeds and feeder styles.

“Native sparrows, mourning doves, and juncos feed on the ground, and goldfinches and purple finches love tubes of thistle seed,” Burger said. “Cardinals, jays, and titmice prefer to be off the ground, and woodpeckers, chickadees, and nuthatches like suet feeders placed on the sides of trees.”

Regardless of the type of feeder used, select one that can be cleaned, can withstand the weather, and will keep food dry. Avoid tray or platform feeders unless they can be adequately drained so feed does not become wet and spoil.

“If bird feed is to be spread near the ground, use a low tray with drainage to prevent feed from growing harmful molds or bacteria,” she said. “Mississippi law restricts feed from being placed directly on the ground to prevent people from baiting wild animals to a site for the intent of hunting them.”

Nearly everyone who has put out a bird feeder has had to deal with unwanted squirrels visiting the food source. Burger said methods that can deter squirrels include suspending the feeder, mounting it on a pole, or using baffles to exclude the rodents. Some of these methods can deter deer as well.

The best places for bird feeders are quiet areas that allow easy access for refilling and good visibility for bird watching. Keep feeders within 3 feet of windows to prevent birds from having high-speed collisions with the glass.

While feeding birds is enjoyable, Burger said birds can generally survive without supplemental feed. However, where birds have become accustomed to reliable food sources, it is best to keep the feeders stocked during periods of severe weather.

“Birds know where to find winter shelter in shrubbery, evergreen trees, brush piles, or available bird houses,” she said.

Although feeding birds is accepted behavior, feeding mammals is different. Squirrels and even deer sometimes visit birdfeeders, and their presence is often considered a nuisance.

Bronson Strickland, wildlife ecology and management specialist with the Mississippi State University Extension Service, said many wildlife professionals discourage feeding any wildlife.

“Wildlife should be wild,” he said. “They are not pets, and close contact with wild animals can lead to dangerous situations for humans.”

While squirrels, rabbits, or other furry creatures may be cute to look at and fun to feed, Strickland said people assume too much liability when they feed wild animals.

“Feeding wildlife unnaturally concentrates animals, which can lead to disease transmission,” Strickland said. “Feeding wildlife may also lead to unintended consequences like deer spending more time in the neighborhood and having collisions with cars.”

Strickland, who also is an assistant Extension professor in the MSU Department of Wildlife, Fisheries, and Aquaculture, said animals actually do not need human help to survive the winter, even in urban areas.

“These animals survive on what is provided them by Mother Nature,” he said.

When people feed wild animals regularly, the animals often come to depend on humans, and this is not a good thing.

“Dependency on man is dangerous for several reasons,” he said. “You may cause an increase in the animal population by providing this artificial food source, and then if this feeding is ever stopped, you have animals that can’t sustain themselves naturally.

“This will lead to more invasive animals, such as raccoons getting into trash cans, and the animals may die if these artificial food sources are removed,” he said.
Plants can increase a person’s productivity, and a Mississippi State University floral design expert is smiling about his new textbook on using plants in interior spaces.

Jim DelPrince, a professor in the MSU Department of Plant and Soil Sciences, spent five years developing a textbook on “interiorscaping” — using green and flowering plants and trees in indoor commercial and residential spaces.

“The textbook, *Interior Plantscaping: Principles and Practices*, is written from the standpoints of plant science, business, and plants as a design element within the interior,” DelPrince said. “In the past, our method of teaching interior plantscaping focused on the production of plants in the greenhouse, with propagation, plant physiology, watering, fertilizing, and light levels being the only topics. Today, we have a very different focus: on the client who ultimately purchases and uses these plants, and on related services that can be offered.”

DelPrince said students interested in an interiorscaping career must understand plant science and solid design principles. This textbook was written with them in mind.

“There are plant science and horticulture programs at all of the land-grant universities, at other universities, at two-year institutions, and even in high school agriculture programs, and this book integrates the learning areas of business, science, and design in such a way that they all can use it,” he said.

DelPrince used his research skills and personal connections within the industry to bring practical information and inspirational success stories into the textbook.

“I included a chapter about value-added opportunities for floral and plant businesses — holiday decorations, gifts for employee birthdays, and retirements. An interiorscaping job doesn’t have to be a one-time installation and maintenance phase following up with watering, fertilizing, and insect inspection. It can be the beginning of an important business relationship,” he said.

Unlike other books on the topic, *Interior Plantscaping* includes chapters on permanent botanical plants and preserved plant materials, otherwise known as silk and dried flowers and plants.

“People who put together and design permanent shrubs and trees are floral artists themselves,” DelPrince said. “They’re replicating nature. But those permanent installations will still need care.”

Juliet Steiner, a product development manager for Cengage Learning, said she was excited to introduce this new book to the market.

“Jim was truly passionate about the project and dedicated to putting together a text that was engaging as well as informative,” Steiner said. “We love that Jim wanted to involve his horticulture students in the project. Their contributions can be seen in many of the Green Tip boxes all throughout the text.”

Steiner said this new textbook is a blend of art and science. "*Interior Plantscaping* is an exciting and unique new text because it blends the science of horticulture with the aesthetics of interior design, while also providing practical information about running a successful business,” she said. “It is filled with beautiful color photos of plants and plant installations and also has a valuable appendix listing all of the included interior plants with key features and photos.”

By formalizing his course notes and developing them into a textbook, DelPrince got to see something he had always dreamed of.

“I wanted to be able to open a textbook and see Mississippi State University on the title page,” he said. “Our floral management program is known all over the country, and administrators from several universities have come to our campus to visit our department.”
The rice-breeding program at Mississippi State University’s 4,800-acre Delta Research and Extension Center is part of a regional program that tests the viability of experimental rice varieties.

MSU’s facility in Stoneville participates in the Uniform Regional Rice Nursery (URRN) program, which tests new genetic material, called germplasm, in various environmental and growing conditions. Researchers at the Delta center test rice germplasm developed in-house or at the University of Arkansas, Louisiana State University, or Texas A&M University.

“The URRN allows breeders at cooperating institutions to test experimental germplasm in multiple and diverse environments and gives an idea of germplasm stability in various environments,” said Tim Walker, a Delta R&E Center agronomist, rice breeder, and Mississippi Agricultural and Forestry Experiment Station researcher.

Each year, the URRN includes a total of 200 entries from Arkansas, Louisiana, Texas, and Mississippi. Because of the size of its rice-breeding program, the Delta R&E Center can submit up to 26 entries.

If a germplasm looks good near the end of its development at the Delta station, it may be submitted to the URRN for further evaluation. Scientists compare new entries to standard, commercially available varieties.

The URRN provides breeders with a wealth of information, such as germplasm performance, disease tolerance, resilience, environmental response, and weed tolerance.

For example, this year, the URRN site in Crowley, La., suffered an outbreak of blast, a disease that affects rice production worldwide. The disease usually affects only leaves but in severe cases can prevent grain production. URRN rice researchers visited Crowley to see how their varieties fared.

“Visiting Crowley during the outbreak helped us determine which germplasm was best at resisting blast,” Walker said. “Though this occurrence is unfortunate for producers because of yield loss, it provided valuable information for rice researchers and breeders.”

Host institutions evaluate germplasm by lodging, yield, grain type, seedling vigor, and plant vigor and heading. They also evaluate the yields of “ratoon” crops, which grow from the remains of already-harvested fields in warmer regions with a longer growing season.

Plant pathologists and weed scientists at host institutions screen URRN entries for disease and herbicide resistance.

“Materials submitted to the URRN are tested for their disease reactions. Plant pathologists then rate the germplasm for disease tolerance,” said Tom Allen, Extension plant pathologist in Stoneville.

Allen introduces the sheath blight fungus into the URRN plants and evaluates the response of each of the germplasm entries. He observes how much of the disease is present in each plot and how severe it is.

Other MAFES researchers who have been involved with the URRN include weed scientist Jason Bond, plant pathologist Gabe Sciumbato, retired rice project leader Ted Miller, and retired rice breeder Dwight Kanter.

Although MSU has been part of the URRN since the 1970s, when Donald Bowman led the station’s rice research program, it is one of the cooperative’s younger members. Additional URRN participants include the University of California—Davis, the University of Missouri, and the U.S. Department of Agriculture.
A few dedicated volunteers are keeping their eyes on Mississippi’s coastal birds and amphibians in hopes of preserving the area’s wildlife for years to come.

Master Naturalists are trained by the Mississippi State University Extension Service to help protect the state’s natural resources. They promote environmental stewardship through education and service in their communities.

“With dwindling budgets, it is much more difficult for state and federal natural resource agencies to keep up with the demands of education and environmental observation,” said Chris Boyd, associate Extension professor of environmental ecology with the MSU Coastal Research and Extension Center. “Master Naturalists are essential to helping educate the community, and they also do a lot of hands-on surveys that help monitor the health of our coastal ecosystems.”

Master Naturalist training courses have been offered primarily in the coastal area of the state since 2008, with 89 individuals completing the program and reaching 13,517 clients. In 2012 alone, a dozen Master Naturalists gave 1,192 service hours, reaching 3,400 clients.

Janet Wright, a retired biology professor from Pennsylvania, went through the class in 2009 to learn about the habitats and natural history of Mississippi’s coast.

“I was very interested in learning more about the ecology of the coast and volunteering in conservation efforts,” said Wright, who lives in Ocean Springs. “But in the end, the Master Naturalist program also turned out to be a great networking opportunity, connecting me to other projects.”

Wright participates in monitoring surveys and programs in coordination with the Mississippi Department of Marine Resources, the National Oceanic and Atmospheric Administration, and the Grand Bay National Research Reserve.

Wright participates in the Audubon Coastal Bird Survey, the Mississippi Amphibian Monitoring Program, the Marsh Bird Survey, the phytoplankton survey, the Diamondback Terrapin nesting survey, and the Mississippi Sandhill Crane count. These surveys help measure the effect of environmental changes on wildlife and their habitats.

“Since the 2010 oil spill, the Audubon Coastal Bird Survey has been done monthly to assess the impact of the spill on coastal resident and migratory birds and to provide a baseline for future studies,” Wright said. “Amphibians are undergoing a global decline, and the amphibian monitoring survey helps focus conservation efforts by documenting the distribution and relative abundance of breeding amphibians.”

In addition to her survey efforts, Wright helps with the annual Mississippi Coastal Cleanup, a project organized by the Mississippi Department of Marine Resources and the Mississippi Marine Debris Task Force.

“The cleanup is a huge worldwide effort every year in October,” said Boyd, who also works with the Mississippi Alabama Sea Grant Consortium. “Many of our Master Naturalists volunteer for this project and help remove trash in our waterways, which is a threat to health and safety.”

In October, 2,545 volunteers picked up 2,053 bags of trash in Hancock, Harrison, and Jackson counties and on the barrier islands, according to a Mississippi Department of Marine Resources news release.

“The Coastal Cleanup is a super way for coast residents to feel like they have a stake in their environment and can help keep it healthy,” Wright said.

To earn Master Naturalist certification, participants must complete 40 hours of classroom and field instruction, eight hours of approved advanced training, and 40 hours of approved volunteer service.

A Master Naturalist training course is tentatively planned for spring/summer 2013 in the Jackson area, pending sufficient demand.

For more information about the Master Naturalist training program, contact Chris Boyd at (228) 546-1025.
County Seat: Greenwood
Population: 32,293
Municipalities: Greenwood, Itta Bena, Morgan City, Schlater, Sidon
Commodities: Corn, Soybeans, Cotton, Peanuts, Rice, Wheat, Catfish
Industries: Viking Range Corporation, Milwaukee Tools, Delta Oil Mill, Farmers Grain, Express Grain, John Richards, Greenwood Gin, HDW Inc., S&N Airaflo, Ag Spray Equipment, Clint Williams Company
Natural Resources: Matthews Brake National Wildlife Refuge
History Notes: Leflore is named for Choctaw leader Greenwood Leflore. He was an American Indian/European leader of the Choctaws and a Mississippi senator. He was elected chief of the entire Choctaw tribe shortly before the Treaty of Dancing Rabbit Creek, becoming the first principal chief of a Choctaw nation that had been governed by regional chiefs.
Attractions: The Museum of the Mississippi Delta features Delta history, as well as art. The Back in the Day Museum leads visitors through the lives of blues legends such as Robert Johnson, John Hurt, and Eddie “Guitar Slim” Jones. Other popular attractions are the Viking Cooking School and the Alluvian Spa. The city of Greenwood also offers tours of the locations used to film a major motion picture based on Mississippi native Kathryn Stockett’s bestselling novel The Help.
Did you know? The Yazoo and Mississippi Valley Railroad Depot Station was constructed in 1918 to replace a wooden structure that had served from the time the rail line was built in 1886. It later became part of the Illinois Central System and is now owned by the Canadian National Railway. The station once again serves passengers as a stop for Amtrak’s City of New Orleans. This train provides daily service to Chicago and its namesake city, New Orleans.

“Leflore County is home to Greenwood, which has developed a reputation as a great shopper’s destination with specialty stores started by local business owners. Greenwood is also known as the place where the Tallahatchie River and the Yalobusha River meet to form the Yazoo River. Leflore County has 243,682 acres in agricultural production of crops and catfish. Soybeans are leading in acres in production with 110,600 acres, and corn follows with 74,000 acres.”

Andy Braswell, Sr., Extension County Director

Editors note: 1/82 is a regular feature highlighting one of Mississippi’s 82 counties.
ASPCA Grant Assists MSU-CVM Program

The American Society for the Prevention of Cruelty to Animals has awarded the Mississippi State University College of Veterinary Medicine a grant to support the college’s Mobile Veterinary Clinic.

The $65,000 grant will cover some of the expenses incurred as the Mobile Veterinary Clinic travels to 18 North Mississippi animal shelters, where students and faculty spay and neuter homeless animals. The program is funded solely by grants and donations.

“We’ve received generous donations allowing us to purchase two mobile units, but that is only part of the fund-raising equation,” said Keith Gaskin, CVM’s senior director of development. “This ASPCA grant helps cover the operational expenses it takes to keep the units on the road.”

Gaskin said a key reason organizations and donors support the program is because it gives students unparalleled surgical experience and helps make shelter animals more adoptable.

Dr. Phil Bushby, CVM’s Marcia Lane Endowed Chair in Human Ethics and Animal Welfare, oversees the clinic and inspires students to help raise money to keep the program moving forward.

“Many of the animal shelters we work with have as high as a 70 percent euthanasia rate, but more than an 80 percent adoption rate for animals that are spayed or neutered,” Bushby said. “The grant from the ASPCA is helping students, shelter animals, and the community.”

Gaskin said the program reaches beyond the shelter and into the community.

“The goal is to get the animals adopted and educate pet owners about the importance of taking those animals to their community veterinarians to ensure good health for as long as possible,” he said.

MSU Extension Professor Gains National Recognition

A Mississippi State University professor recently won an award from the Entomological Society of America for his professional service to agricultural producers in the Southeast.

Angus Catchot, an Extension Service agronomic crops entomologist, was named the 2013 recipient of the Distinguished Achievement Award in Extension. The society’s southeastern branch nominated Catchot because of his noteworthy program creativity, impact, achievement, and delivery of services.

“Dr. Catchot is very deserving of this award because of his commitment to agronomic crop entomology, his passion for Extension, and his service to clientele in the state of Mississippi and the Southeastern region,” said Scott Willard, head of the MSU Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology. “He is selfless in his pursuit of team-oriented, collaborative opportunities that expand the capabilities of others toward solving real-world problems for our producers.”

Catchot joined the MSU Extension Service in 2004. Over the past seven years, he has conducted a nationally recognized Extension entomology program geared toward agronomic crops. Catchot has numerous publications, presentations, and media appearances to his credit. He has generated almost $3 million in grant support for his Extension and research program.

“I have been impressed with his knowledge, determination, foresight, and expertise as an applied entomologist. We, as all farmers in the state, need applied research, and he has led the charge to ensure that takes place,” said Mississippi Delta grower Mike Sturdivant, Jr., in an endorsement letter for Catchot.

MSU Entomology Student Earns National Recognition

A Mississippi State University graduate student earned a national award for his paper on the biology of insect pests.

Nathan Little of Charleston, a graduate student in the Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, received the annual student award. His paper on subterranean termites was described as the most interesting and novel peer-reviewed research paper among more than 20 applications that were received this year from students around the world.

The award is sponsored by the TREE Foundation, a nonprofit organization dedicated to tree research, exploration, and education. The Ambrosia Symbiosis Research Group confers this award.

The title of Little’s paper is “Preference of Native Subterranean Termites for Wood Containing Bark Beetle Pheromones and Blue-Stain Fungi,” and it was published in the Journal of Insect Behavior.
Catchot is also noted for his forward-thinking approach to technology. His work to switch a paper newsletter to an online blog resulted in two awards for teamwork and innovation.

“Extension is the perfect fit for Angus Catchot,” said Gary Jackson, director of the MSU Extension Service. “He has true passion for his role, vision for his profession, and commitment to his clients. He is an excellent scientist who understands the scholarship of outreach, which is a part of the mission of a land-grant institution like Mississippi State. Dr. Catchot is very deserving of this national recognition.”

Dr. Bruce Glick Elected to American Poultry Historical Society Hall of Fame

The late Dr. Bruce Glick has been elected to the American Poultry Historical Society Hall of Fame. Glick’s 40-year academic career included renowned international research, dedicated teaching, and caring service. He was a Giles Distinguished Professor of Poultry Science at Mississippi State University and chair of the Clemson University Poultry Science Department.

His doctoral research focused on the bursa of Fabricius, an organ unique to birds. His discovery of the bursa’s role in B cell development for antibody production constituted a pivotal immunology milestone supporting humoral and cellular immune system components. This work was honored as a 1979 Current Contents Citation Classic and as a Landmark Contribution to Poultry Science in the 2008 Poultry Science Association Centennial symposium. Other publications cited the paper 605 times through 2012.

He mentored 29 graduate students who received 33 degrees. Many of these students engaged in academic or government research careers. Seventeen postdoctoral fellows expanded their experience in his laboratory. He conveyed critical concepts to his students through innovative teaching. More importantly, Glick inspired students and coworkers through his patience, precision, resolve, and hard work. He valued people working together to reach a defined goal.

Glick joined the Mississippi State University faculty in 1955. He rose to full professor rank, ultimately being named Giles Distinguished Professor – the institution’s highest faculty honor. First Mississippi Corporation, Mississippi Academy of Sciences, MSU Alumni Association, and Gamma Sigma Delta bestowed awards for his research. He led acquisition of funds to expand the MSU Poultry Science Building. He became head of the Clemson University Poultry Science Department in 1986, where he served until 1995. An animal biotechnology research program and enhanced faculty interaction with the South Carolina poultry industry were hallmarks of his tenure.

The American Poultry Historical Society recognizes leadership in the poultry industry by electing individuals of exceptional character and integrity, who have rendered outstanding and unselfish service to the poultry industry, to the Hall of Fame.

MSU Economists Funded for Biofuel Policy Study

A team of Mississippi State University agricultural economists recently received funding from the U.S. Department of Agriculture to study policies impacting biofuel supply chains.

Keith Coble, a Giles Distinguished Professor at MSU, is the principal investigator for a project to develop a policy evaluation model to assess how state or federal policies might impact the development of the Southeastern biofuels industry. Coble will work with fellow MSU agricultural economists Daniel Petrolia and J. Corey Miller. Their work will inform the development of regional perennial grass-based biofuels production systems by evaluating the effects of risk, incentives, and environmental policy on economic sustainability.

All three researchers are affiliated with MSU’s Sustainable Energy Research Center, which researches and develops environmentally and economically sustainable energy technologies that promote the growth of sustainable energy industries in Mississippi and the Southeast.

“Dr. Coble is a national expert in agricultural policy-related research, and I have great confidence in this team of agricultural economists to lead the research and education efforts for this program,” said George Hopper, director of the Mississippi Agricultural and Forestry Experiment Station and dean of the College of Agriculture and Life Sciences.

The USDA’s National Institute of Food and Agriculture awarded the $273,120 grant through its Agriculture and Food Research Initiative. In the bioenergy sector, the institute is funding projects that study how biofuels production programs will contribute positively to rural economies, help increase energy independence, and work well with current agricultural systems.

Coble has been a professor in MSU’s agricultural economics department since 1997. Within his profession, Coble is currently serving on the board of directors of the Agricultural and Applied Economics Association. He also serves on the Council on Food, Agricultural, and Resource Economics’ Blue Ribbon Panel of Experts, which provides guidance about national and international matters of significance to policymakers.
The generosity of one of Mississippi’s most famous residents attracts students from diverse cultural backgrounds and aids their enrollment in the Mississippi State University College of Veterinary Medicine.

Award-winning and esteemed actor Morgan Freeman established the Morgan Freeman Endowment for Veterinary Medicine in 1998 to make a quality education available to young Mississippian interested in veterinary careers. Funds from the endowment are awarded by CVM’s scholarship committee to a veterinary student who meets the qualifications Freeman established to help the college aggressively recruit underrepresented minority students.

MSU-CVM’s statistics reflect a national pattern of predominantly Caucasian female applicants, with steadily increasing numbers of underrepresented minority applicants. For example, underrepresented minority students make up 6.25 percent of the class of 2013, followed by 7.06 percent, 14.11 percent, and 10.59 percent in subsequent classes.

Dr. Richard Meiring, assistant dean for Admissions and Student Affairs, said the Freeman scholarship is advertised to all students, who apply using the standardized form that includes information such as GPA, financial need, career goals, leadership experience, and participation in extracurricular activities.

“From my standpoint, the Freeman scholarship’s advantage is that it helps us recruit and retain minority students from Mississippi who might otherwise not be able to come to CVM,” Meiring said. “This scholarship is a recruitment tool when I talk to minority students. It’s usually awarded once every four years. Typically, students receive it as freshmen and keep it for the four years they’re here in veterinary school.”

MSU-CVM students graduate with an average debt load of $130,000. Meiring said the scholarship is a great help to students and the college.

“It helps remove the onus of the financial hardship to attend, and Mr. Freeman’s name being attached to it adds a lot of credibility to the scholarship and the school,” he said.

MSU-CVM professor Dr. Skip Jack has mentored Camille Harris of Ridgeland, the 2002 Freeman scholar, since her high school days at the Mississippi School for Math and Science, when she spent a semester conducting research at CVM. He said she benefited immensely from the Freeman scholarship and works hard to give back to her profession.

“Camille was probably one of the most organized vet students I’ve ever dealt with. She’s very smart and very engaged,” Jack said. “She’s also a caring individual; she hurt for her patients she couldn’t help. She took a personal interest in each of her cases and would put in extra hours of study.”

Harris credits the Freeman scholarship, which she received for two years, with advancing her career.

“I worked my first and second year of vet school, so it was great to have financial support for my clinical year and externship year,” Harris said. “Because
I had nontraditional career goals in wildlife medicine, the scholarship was immensely helpful to me. When I travel and talk about MSU, I often highlight this scholarship and Mr. Freeman’s support of MSU-CVM.”

Harris graduated from MSU with her DVM and a master’s degree, and then became an intern at the Wildlife Center of Virginia. She is currently a Ph.D. candidate at Virginia Tech. While in school, Harris continues to practice as a small-animal emergency veterinarian and is an officer in the U.S. Army Veterinary Corps Reserves. She recently returned from a deployment to the Middle East.

Other Freeman scholars are working to recruit minority students to the profession. Dr. Talisha Moore, a 2011 MSU-CVM graduate and Freeman scholarship recipient, is currently a small-animal medicine and surgery intern at MSU-CVM. She recently spoke to young people at the Boys and Girls Club in Starkville about careers in veterinary medicine.

“My work with the Boys and Girls Club stems from my desire to diversify the veterinary profession as a whole, as well as the veterinary classes of MSU-CVM,” Moore said. “I had very supportive parents who introduced me to animals at a young age. They supported my decision to pursue a career in veterinary medicine throughout high school and college. However, I do not feel this is the case for many minorities. As a result, I feel it is very important to offer guidance to kids at a young age and mentor those who have a serious interest in the profession.”

Moore invited Courtney Hunter of Jackson, a DVM/Ph.D. student, to join her for the club presentation. Hunter will receive the 2013 Morgan Freeman Scholarship.

“I have been aware of this scholarship since I first came to the CVM’s Open House in the ninth grade,” Hunter said. “It has always been something that I hoped for as I worked to complete all of the classes needed for vet school admission. I am ecstatic and also extremely grateful to the CVM and Mr. Freeman.”

The current Freeman scholar, Carlson Graham of Batesville, will graduate this spring and is interested in food-animal medicine and theriogenology. Graham recalled receiving a mysterious e-mail from Meiring requesting a meeting to discuss something important, which made him nervous.

“To my surprise, it was one of the best things that ever could have happened for me,” Graham said. “When looking at the debt load that we face as veterinary students, the Morgan Freeman scholarship has helped me tremendously. It’s given me a running start that I wish everyone could have.

“Even before receiving this award, I considered Mr. Freeman to be one of my favorite actors,” Graham said. “My name may never be known to the extent that Morgan Freeman’s is, but this honor has inspired me to give back in the hope that I can help someone like myself.”

The “pay it forward” mentality of the Freeman scholars will benefit future CVM students and reach far beyond the MSU campus.

“Morgan’s scholarship is a great example of how his generosity has changed students’ lives forever, as well as benefited society as a whole, and we are extremely grateful to him for that,” said Keith Gaskin, senior director of development for CVM.
A January storm left a light covering of snow on the MSU campus. Students soldiered on, but many stopped to build snowmen or have a snowball fight on their way across the drill field. (MSU Ag Communications/Tim McAlavy)