MSU Emphasizes Pollinator Research and Education … page 15

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

Mississippi State University
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Fall is a race to the finish line for our agricultural producers, but it’s also a bright start for our new and returning students. Students, faculty, and staff in the MSU Division of Agriculture, Forestry, and Veterinary Medicine all benefit from the ongoing assistance we receive from a variety of supporters who share our passion for the land-grant mission.

Each year, students receive scholarships from industry partners, such as the Mississippi Poultry Association, to pursue their agricultural careers. Read more about this program on pages 30–31.

Funds from commodity checkoff programs also boost our research efforts. Last year, DAFVM units used about $3.5 million of these funds to study a broad range of issues, such as irrigation, weed control, and insect pest management. Checkoff funds are critically important, especially in light of the sluggish U.S. and global economies. Our state economy is more dependent on agricultural revenues, which have been suffering from low commodity prices. Consequently, tax revenues in Mississippi have not grown at the anticipated rate. MSU and DAFVM, like all state agencies, are economizing to meet our reduced budgets, while maintaining our commitment to needs-based research, Extension, and academic programs.

Students in DAFVM’s three colleges have returned to campus this fall filled with enthusiasm for their studies here and also study-abroad experiences. Division faculty and staff led studies in New Zealand, Tanzania, Uganda, the Netherlands, England, China, and elsewhere.

MSU continues to grow its reputation as an internationally known institution, and promoting diversity in all areas only increases that reputation. For example, turn to page 26 to read about an Egyptian researcher hosted by the College of Agriculture and Life Sciences.

In June, the annual 4-H Club Congress brought 441 of Mississippi’s brightest and best senior 4-H’ers to campus for 3 days of contests, workshops, meetings, and fun activities. These future leaders impressed us with their talents and skills—from welding to public speaking to robotics and more. Congratulations to the newly elected officers and ambassadors, and to all of the scholarship winners.

This year’s 4-H Congress attendees pledged their hands to larger service through a community-service project called “Thank a Veteran.” Project volunteers wrote notes to military personnel and packed boxes of toiletries to send to those serving in the U.S. Armed Forces.

In August, MSU hosted the second annual Seed Tech Short Course. Industry partners, including DuPont Pioneer, LMC Manufacturing, Bayer CropScience, the U.S. Department of Agriculture, and the Farm Journal Foundation, participated in the workshop, along with MSU partners, including MSU Foundation Seed and the MSU Seed Testing Laboratory.

Whether you want to learn more about pollinators (see pages 15–21) or marvel at the unique work done to help the endangered Gulf sturgeon (page 4), we hope you find something inspiring in the pages of this issue of LandMarks.

Warm wishes for a bountiful harvest,

Gregory A. Bohach
Imagine going to the doctor, getting a small piece of bone sampled, and receiving a report about where you’ve been at different stages of your life. What may sound like science fiction is an actual scientific method used by MSU researchers to study the behavior of one of the South’s most storied fish: the endangered Gulf sturgeon.

Many people are aware of the sturgeon only through media reports of boaters in Florida who are injured by giant fish leaping out of the water. And the toothless giant’s public appeal is further challenged by its prehistoric appearance, with “scutes” or armored plates along its sides and back.

However, the sturgeon faces far worse problems than poor public relations. Scientists estimate that years of overfishing, dredging, water-control structures, and declining water quality have left fewer than 20,000 Gulf sturgeons in the wild.

To better understand the Gulf sturgeon, Dr. Peter Allen, an associate professor of aquatic sciences in the MSU Forest and Wildlife Research Center, worked with other Mississippi State researchers from the College of Veterinary Medicine and the Department of Geosciences to determine where the fish live over the course of their lives and how they heal after sampling. They collaborated with researchers at Delaware State Univer-
For their study, the researchers compared samples from wild fish with samples from the closely related subspecies, Atlantic sturgeon, held in fresh, brackish, and salt water at the MSU South Farm Aquaculture Facility. Gulf sturgeons are anadromous, which means they move between fresh and saltwater bodies.

"You can take a small, 1- to 2-centimeter section of the pectoral fin, which is one of the few bony structures in sturgeons," Allen said. "The fish incorporate the chemistry of the surrounding water into the growing bone, so based on changes in water chemistry, you can get a picture of where they have been. The great thing is you don't have to kill the fish, and they will heal following the sampling.

"The cross section of the bone looks like a tree, with concentric rings," Allen added. "It's the same idea: We can age the fish based on those rings and estimate how old the fish is. Based on the chemistry changes within each of the age rings and water analyses, we see water chemistry of river, estuary, or ocean. We found, at age 1, the fish are in fresh water; at age 2, they may move into estuaries; and by age 5, they are mostly in the ocean."

Gulf sturgeons spend most of their lives in the warm, salty waters of the Gulf of Mexico, but they return to their freshwater homes to spawn. Seven coastal rivers from the tip of Florida through Alabama, Mississippi, and Louisiana host sturgeons. These fish once lived for more than 40 years, but now they may live about 20–25 years.

For proper management of many sturgeon species, an understanding of age and habitat use is very important. However, determining age and habitat use is difficult due to the rarity of the fish and the difficulty of determining their age except through fin samples.

Allen uses a technique new to Gulf sturgeon research. It involves laser and mass spectrometry analysis of the bone structures. Dr. Rinat Gabitov of the MSU Department of Geosciences has been a collaborator on studying the crystalline structure in the bone. Drs. Erin Brinkman, Wes Baumgartner, and Lora Petrie-Hanson of the MSU College of Veterinary Medicine showed that the sampled fins will heal, a very important development in the study of this species.

Brinkman, a veterinary radiologist, interpreted X-rays taken of 34 fish on three separate occasions during a span of 7 months. While X-raying these fish was an unusual experience for this CVM alumna, she loved the creativity required by the challenge, and she enjoyed collaborating on a project of this nature.

"We looked at the fish after a small portion of fin had been removed to see if the fin healed, and with some of the fish, you couldn’t tell anything had happened to the fin," Brinkman said. "This study showed we can get information about the fish without causing long-term damage."

Fin structures have been collected for aging purposes in many sturgeon species, but until now, no one knew how they healed. The X-ray results showed some sampling methods were better than others in terms of healing.

Understanding when these fish move and the habitats they occupy helps scientists determine ways to better support them at critical stages. That understanding will aid in the development of Gulf restoration projects.

"Most mortality occurs in the early life history, from birth to a certain size. When they get big enough, they aren’t getting eaten by predators," Allen observed. "Part of our work has been looking at how fish handle salt and trying to figure out, based on lab studies, when they move to marine environments. Figuring out their habitat requirements at different life stages will help us start to manage the fish and understand their environments.

"Gulf sturgeon is a key species in the Gulf restoration effort," he added. "These fish are a sentinel species that tell us about environmental quality. They’re also a charismatic species because they get large—up to about 8 feet. I’d call them one of Mississippi’s natural heritage riches."

Mississippi is one of the most diverse states for sturgeons, serving as home to the Gulf sturgeon and three species in the Mississippi River, as well as the paddlefish. Allen and his team hope their research will help this diversity continue well into the future.
Dr. Jan Chambers focuses on mentoring students from diverse backgrounds. She has worked with numerous active military students, including Air Force Maj. Steven Dezell (left). She mentored Dr. Antonio Ward (right) as he worked toward his PhD in environmental toxicology.
A growing list of women, veterans, and people with diverse ethnic backgrounds are pursuing scientific careers thanks to Dr. Jan Chambers’s guidance.

Chambers, director of the MSU Center for Environmental Health Sciences (CEHS) and William L. Giles Distinguished Professor in the MSU College of Veterinary Medicine, said she might not be a scientist herself without her own mentors.

“I’ve had a few professional ‘heroes’ in my career,” Chambers explained. “I define those as individuals who saw more career potential in me than I had ever seen in myself, and provided the encouragement and opportunity for me to achieve more than I would have predicted for myself. I have tried to emulate some of these people by encouraging greater achievement in some of the students I have had who did not have that much encouragement from family and friends and who did not have many role models to emulate.”

Chambers’s career includes a long list of achievements and board appointments. As a professor, she finds the most meaning in helping her students reach their potential. As a toxicology researcher, she has had a rewarding career working with other MSU faculty and staff to develop antidotes to chemical weapons—namely nerve agents.

These weapons are highly toxic chemical warfare agents that inactivate a critical nervous system enzyme, leading to convulsions and respiratory shutdown. The threat of these weapons to soldiers and civilians has loomed since World War II. Effective antidotes can save lives by restoring the enzyme’s activity.

With Chambers’s participation, CEHS has had support from both the U.S. Department of Defense and the National Institutes of Health to develop a line of chemistry that improves the function of current antidotes. The center was granted a patent for these chemicals in January.

Dr. Howard Chambers, her husband and a professor of toxicology and entomology in the Mississippi Agricultural and Forestry Experiment Station, developed the chemistry for the antidote.

“The antidotes that we have invented here at MSU can penetrate into the brain and restore some of the target enzyme’s function in our studies of laboratory animals using surrogates for the nerve agents,” Jan Chambers said. “We are continuing experiments to better characterize these antidotes and are hopeful that they will be able to not only save lives, but also save brains.”

Chambers said having a mentor in her formative years was critical to her path toward molecular research and being a mentor to future scientists. She grew up in California and was going to a small parochial school there when her biology teacher, Sister Rosemary Campi, pushed her to do a science fair project.

“She recruited a few very promising sophomores into science by funneling them into some pretty sophisticated science fair projects,” Chambers said. “Some of those involved the use of laboratories at the University of California at Berkeley, which was very inspirational. Her special interest in my project success and future success in other classes, college, postbaccalaureate training, and my career has always meant a great deal to me.”

Though Campi’s interest and mentorship may not have been obvious to Chambers early on, the teacher served as a role model for mentorship that went beyond just teaching a class.

“I believe I subconsciously decided to emulate that kind of mentorship to all my graduate students, some of whom have been ethnic minorities and women who are still in lower numbers in the life sciences than Caucasians and men,” she observed.

Chambers parlayed her high school academic success into college scholarships. She went to the University of San Francisco, a private liberal-arts college.

“I realized what education could do to change the career futures for underserved minorities in Berkeley and in San Francisco,” she said. “That was inspiration for me to help others to achieve something that general society would predict as unlikely for them.”

Dr. Antonio Ward is one of 13 minority scientists who have achieved career success after receiving graduate and doctoral degrees through CEHS under Chambers’s watch. Ward earned his PhD in environmental toxicology at MSU in May and joined the Mitchell Cancer Institute at the University of South Alabama. He tests potential pharmaceutical compounds to determine how effectively they destroy cancer cells.

“Dr. Chambers has a great track record of reaching out to minorities and making sure they have a fair chance at obtaining graduate degrees,” Ward said. “I met her when I was taking a master’s degree course. I was doing well in her class, and she pulled me aside one day and talked to me about pursuing a doctoral degree.

While I was earning my PhD, she was always available and approachable, and she worked with me to make sure I was doing what I wanted to do and what I was supposed to do to complete my research project and earn the degree,” he said.

Chambers also advises doctoral students who are on active duty with the U.S. Air Force. Two officers have completed PhDs under her guidance, another is in his second year, and a fourth will begin the program in the fall. As part of a scholarship program, active-duty officers must complete their PhD work in 3 years, which is much faster than a normal doctoral program.

“As a mentor, I am committed to having military enrollees successfully complete their programs in the timeframe available,” she said. “Needless to say, these students are highly motivated and have outstanding work ethics. I have had at least five additional graduate students who were also active-duty military, veterans, or reserves.”

While Chambers has recruited students from a wide range of backgrounds into her graduate program and worked with them to find the career paths that best suit them, the people who have successfully completed the degree share a common trait: persistence.

“All of these people wanted to do a good job and improve the likelihood of obtaining good professional careers,” she said, “and they’ve earned all the success they have now.”

By Nathan Gregory
Farmers Save Time and Boost Profits
with Minimum-Till System

Producer Walter Lavigne (left) and Randy Smith, MSU Extension area agronomist, examine a seed bed prepared by the Red Iron RipTill implement.
Mississippi farmers know time is money. A group of small-acreage row-crop producers in south Mississippi save both time and money with a double-cropping system that uses global-positioning technology and a custom-built, one-pass planter. The system, which relies on a four- to six-row, vertical-tillage planter, helps growers increase profitability. It also boosts root development and yields while reducing weeds, soil erosion, and soil compaction. Additionally, the system has positive environmental attributes and water-use benefits.

A similar system has been around about 30 years, but farmers in the southern part of the state have revived it over the last 8–10 years. This revival is largely due to improved technology, as well as the efforts of growers in the region working with Randy Smith, MSU Extension Service area agronomist.

“The minimum-tillage system breaks the soil vertically beneath the row,” Smith said. “Vertical tillage allows deep taproot development that doesn’t exist with other systems and allows the root to explore the soil profile for nutrients and water. Running a disc multiple times compacts soil and allows it to dry out. The one-pass system helps conserve soil moisture, sustaining plants longer without irrigation.”

Randy Smith

“I can till and plant in one pass now instead of four or five,” he said. “As far as financial savings, I have a neighbor who hired someone to disc his fields. He charged $15 per acre per discing. I don’t know if I’d do it for that. I’d probably charge $20 per acre per discing. At four discings, that’s $80 an acre.”

Lavigne said he grows an average of 46 bushels per acre of soybeans and 185 bushels per acre of corn using the system with no irrigation. Before he began using the system, his fields yielded 20 bushels of soybeans and 100 bushels of corn per acre.

Roman Rials, whose family farm is a few miles away from Lavigne’s property, began using the system 4 years ago after seeing the success Lavigne had with his first corn crop planted with the RipTill.

“We had a conventionally planted corn crop on bottomland that year,” Rials said. “And it was so burned up because of dry weather that the leaves were a little yellow and were rolled up like cigars. We saw Walter’s corn that was planted on a hillside was doing great. That was the first crop he’d planted using the vertical-till planter.”

Since he purchased a four-row, strip-till planter, Rials has decreased the time he spends in the field and increased his yields.

“For a conventionally planted corn crop, it takes seven trips over the field to get it in the ground,” he said. “Now we’re doing it in one trip. We have about 540 acres in corn, so that’s a lot of hours and diesel fuel saved.”

Since 2012, Rials’s yields have increased, and weeds have decreased. For conventionally planted corn silage, his yields averaged around 15 tons per acre, but with the new method, he has produced about 24 tons per acre. This silage more than meets the needs of his dairy cows.

“We produce enough corn silage to be 100 percent self-sufficient,” Rials said. “Our goal is to produce enough of our own grain corn and soybeans to provide 60 to 70 percent of our own feed for our dairy herd. I also have fewer weeds in the field because there is very little topsoil disturbed by this piece of equipment.”

Smith plans to establish replicated studies of this minimum-till, double-crop system in the next year to formally analyze crop yields and income.

“I’ve worked with this system for 8 years on a demonstration basis with great success,” Smith said. “If it wasn’t working for these guys, they would not be using it.”
During the fall 2015 semester, Colonel Kenneth “K. D.” Johnson cut the ribbon for the second phase of the Thompson Hall courtyard that bears his name, but his contributions to the MSU College of Forest Resources (CFR) go well beyond his donation for the new landscaping.

Likewise, the new courtyard is more than a nice view for students and faculty. It serves as an outdoor classroom for several campus departments, as well as for the professor who designed the area.

The 93-year-old World War II veteran’s history with MSU dates back to 1942, when he began studying engineering at what was then Mississippi State College. Johnson would soon embark on a military career of more than 30 years before he returned for a second academic stint in 1978. It was then that he began a long partnership with CFR.

Jeff Little, CFR director of development, said Johnson—known to many as “The Colonel”—is one of the most significant individuals ever involved with the college.

“If you have had any involvement with the College of Forest Resources, then you have almost certainly been impacted by his generosity,” Little said. “He has helped educate numerous forestry students, provided faculty awards, hosted events for our staff, shared advice with our administrators, and built a wonderful outdoor environment for students, faculty, staff, and visitors to enjoy. I don’t know of any one human being who has done more for our college than Colonel Johnson.”

Johnson also has made major contributions in service to the nation. After enlisting, he completed pilot training and was commissioned as a second lieutenant in February 1944. During WWII, he served as a transport pilot in Europe and
was active in transporting supplies and evacuating the wounded from France after D-Day. His last assignment on his 30-month European tour was as a pilot for the late Justice Robert Jackson, chief prosecutor at the war crimes trials in Nuremberg, Germany.

Johnson was assigned to Korea in 1951 and flew 59 missions as a B-26 pilot during the Korean War. He was later awarded the Distinguished Flying Cross.

During his career, Johnson logged more than 15,000 hours—the equivalent of nearly 2 years in the air—of accident-free flying time. Only 1 percent of all U.S. Air Force air-crew members have achieved that feat.

Johnson was an operations officer, squadron commander, and wing deputy commander for operations before being promoted to full colonel in 1967 and assigned as a wing deputy commander for operations at Norton Air Force Base in California. From there, he moved to Rhein-Main Air Base in Germany, where he served as deputy wing commander for operations in the 322nd Tactical Airlift Wing.

He concluded more than three decades of service in Oklahoma City, where he served as senior Air Force advisor to the Oklahoma National Guard. When he retired, Johnson was awarded the Legion of Merit—one of the highest awards presented to U.S. military personnel.

His return to academia was a 9-week summer field session at the MSU College of Forest Resources. Johnson later created six endowments for the college, including the Colonel Kenneth (K. D.) Johnson and Catherine B. Johnson Endowed Scholarship Fund, two endowments for excellence, a summer field-session fund, and funding for the courtyard construction and planting.

Robert Brzuszek, a professor in the Department of Landscape Architecture, designed both phases of the Johnson courtyard. The first phase, completed in 2007, is a wet meadow in the main plaza entry to Thompson Hall. The second phase, codedsigned by Cory Gallo, associate professor of landscape architecture, is a cove forest featuring two seating areas. The courtyard prominently features plants native to North Mississippi, including a variety of grasses, wildflowers, trees, and shrubs. In addition to seating areas, the gardens also include walking paths.

“While the original planting offered only four species of exotic trees and groundcovers with very limited wildlife use, the redesigned landscape now offers over 60 species of native plants," Brzuszek said.

“The wet meadow idea came from a preexisting water feature to give it an appropriate setting,” he added. “We used sunny native wetland edge species, including perennials such as asters and irises, and shrubs like buttonbush and viburnum. The cove forest is based on the red-clay hills just to our west, which have protected pockets on forested slopes. The shady slope conditions of the courtyard were perfect for this.”

The courtyard is frequently used as a classroom by professors and instructors in forestry, wildlife, horticulture, and landscape architecture. Part of the design was driven by student projects, providing Brzuszek’s students an opportunity to design using local plant systems.

“Insects and birds are attracted to these plants, which shows how an ecosystem works to benefit multiple users,” he said. “There is also a public education aspect in that Thompson Hall is a popular place for football game tailgaters and visitors, so they learn about Mississippi plant communities, as well. Many people don’t realize just how beautiful many of our state’s native plants really are, and this garden displays how they can be pleasingly arranged in a landscape.”

One of those tailgaters is Johnson himself. At 93, he still drives himself from his home in Ridgeland for most home football games to tailgate with CFR faculty, personnel, and students. Dean George Hopper said he has become instantly recognizable by everyone in the college.

“Faculty, staff, and students all recognize and appreciate the Colonel’s contributions to the College of Forest Resources,” Hopper said. “They all know the Colonel. He’s a man who commands respect due to his fascinating life and the incredible contributions he’s made to his country, and we thank him for his overwhelming generosity.”
"The Extension Service and MAFES researchers have studied a wide variety of control options trying to find the right combinations with the best results. Their efforts to establish economic thresholds for treatments are very important in control success. They are always focused on best management practices."

— Tucker Miller
Researchers also improved efficiency by changing from white to black drop cloths, which improved insect visibility and scouting accuracy. This may seem like a very minor change, but efficiency increased dramatically, Catchot said. Growers and consultants can now make pesticide-application decisions more quickly and accurately.

“Using integrated-pest-management (IPM) practices pays dividends to growers,” he said. “Broad-spectrum use of insecticides can reduce the number of beneficial insects, so we try to find alternatives that provide relief from damaging numbers.”

Researchers with the Mississippi Agricultural and Forestry Experiment Station are working with industry officials on some new traits that have shown promise in helping to control some of the other sucking bugs that attack cotton.

“In the past, insect traits have been mostly limited to caterpillar-type pests, so this is exciting, especially given how severe plant bugs are in the Delta region,” Catchot said. “We have been evaluating these new cotton traits since 2008 and have started to see some major benefits for plant-bug management. This technology could offer tarnished-plant-bug control in the future and reduce reliance on chemical sprays.

“Before 1995, insecticides that targeted boll weevils and tobacco budworms helped control plant bugs,” Catchot said. “With the arrival of Bt cotton and the boll weevil eradication program, fewer insecticides were being sprayed, and tarnished plant bugs filled that gap. However, the biggest factor that occurred about the same time was more widespread resistance to insecticides.”

In recent years, it has become extremely difficult to get new products registered, Catchot said.

“The regulatory process seems to be more difficult every year,” he said. “In the meantime, our research and demonstration programs in the Midsouth have discovered enough weaknesses of the tarnished plant bug that, if we use all the findings in a fully integrated program, we can be successful growing cotton and reducing the total number of sprays for this pest.”

Catchot described this as the true definition of IPM.

“IPM incorporates all available techniques to control a pest, while minimizing the impact on the environment,” he explained. “An important misconception that has emerged recently is that the use of insecticides is anti-IPM. In reality, insecticides remain a very important component of IPM when fields are scouted by professional consultants and sprays are made based on Extension Service thresholds that were established with sound research.”

Tucker Miller, a private crop consultant, has battled cotton pests for four decades in the Mississippi Delta.

“Boll weevils were bad before eradication, but I think tarnished plant bugs are even worse,” he said. “With enough pesticide, you could control boll weevils, but plant bugs develop resistance to certain treatments, and we have to adjust.”

Miller credits MSU with any successes producers have in controlling tarnished plant bugs.

“The Extension Service and MAFES researchers have studied a wide variety of control options trying to find the right combinations with the best results,” Miller said. “Their efforts to establish economic thresholds for treatments are very important in control success. They are always focused on best management practices.”

By Linda Breazeale • Submitted photos
Mississippi State University salutes its most distinguished alumni annually with a special campus ceremony. Among the 2016 honorees are three graduates who represent the colleges that comprise the Division of Agriculture, Forestry, and Veterinary Medicine.

These three alumni of the year are George D. “Dave” Thomas Jr. of Collierville, Tennessee, College of Agriculture and Life Sciences; John D. Enlow of Little Rock, Arkansas, College of Forest Resources; and Dr. Andrew Grady of Jackson, Mississippi, College of Veterinary Medicine. Each of these graduates of the 138-year-old land-grant institution is well known for his professional achievements and community service.

These alumni, along with an additional five honorees from the other MSU colleges, represent the caliber of more than 135,000 living graduates who maintain connections with the university as loyal members of the MSU Alumni Association. For more on those honored at the annual alumni awards banquet, visit alumni.msstate.edu.

Alumni of the Year Honored

GEORGE D. “DAVE” THOMAS JR.

Thomas is vice president of marketing for Helena Chemical Company, a position he has held since 2009. Helena is one of the world’s foremost agricultural chemical formulators and distributors, and Thomas’s responsibilities include all acquisitions, fertilizers, precision agriculture, and application technologies. Since he joined Helena in 1987, Thomas has served as location manager for Louisiana and Mississippi and as manager for the South Delta Division and South Texas Division.

Beyond his role with Helena Chemical, Thomas is a national leader in the agricultural industry. He is a board member of the Crop Protection Association, Agricultural Retailers Association, and Fluid Fertilizer Foundation.

Thomas earned a master’s degree in agricultural economics from Mississippi State in 1987. He also holds a bachelor’s degree in mathematics from the University of Mississippi.

JOHN D. ENLOW

Enlow, a highly respected conservationist and businessman, is vice president of real estate and Southern timberlands at Weyerhaeuser Company, one of the largest private owners of forestland worldwide. Enlow joined Weyerhaeuser in 2014 to lead the company’s Southern division, and he assumed leadership of the company’s real estate nationally in 2015.

Enlow has broad experience in forestry, business development, procurement, finance, and sales. During his early career as a forester with Union Camp and Rayonier, he served as a financial analyst, wood product sales agent, and manager.

Enlow is recognized across the nation as a forest industries leader. He serves as a board member of the Forest Resources Association, Georgia Forestry Association, and Wood Supply Research Institute.

Along with the forestry degree he earned from Mississippi State in 1990, Enlow also holds an MBA from Brenau University. His résumé also includes graduation from the Executive Education Strategy Program of The Wharton School at the University of Pennsylvania.

ANDREW W. GRADY

Grady is an associate professor in the Department of Microbiology at the University of Mississippi Medical Center (UMMC). He also directs the UMMC Center for Comparative Research, where he is instrumental in the growth of the medical center’s laboratory-animal facilities. Since 2001, Grady has served as veterinary medical officer for the Jackson-based Veterans Affairs Medical Center.

Grady is board certified in laboratory-animal medicine and currently serves as a member of the Council on Accreditation of the Association for Assessment and Accreditation of Laboratory Animal Care International. He is also vice president of the association, which gives him greater insight in implementing accreditation guidelines for conducting ethical research using animals at all accredited facilities.

Grady serves as an adjunct professor in the MSU College of Veterinary Medicine Department of Clinical Sciences. He earned a Doctor of Veterinary Medicine from the university in 1986 and later completed a residency here in aquatic animal medicine. Grady also holds a master’s in laboratory animal medicine from the University of Missouri, where he completed a second residency and held a postdoctoral fellowship. He subsequently achieved diplomate status in the American College of Laboratory Animal Medicine.
Pollinators often go unnoticed, busily working brightly colored blooms in the backyard, by the roadside, in home gardens, and along rows of lush agricultural crops.
As concern for declining populations of honeybees and monarch butterflies grows, the general public has become more interested in and curious about pollinators. As a result, Mississippi State University is emphasizing education and research related to these insects.

Dr. Jeff Harris, bee specialist with the MSU Extension Service and scientist in the Mississippi Agricultural and Forestry Experiment Station, said the number of hobbyist beekeepers is on the rise all over the state.

“When I ask people why they are coming to beekeeping classes, many say that they have heard of the demise of honeybees, and they just want to help by keeping bees themselves,” Harris explained. “There are also some that have always wanted to try keeping bees, but it has been the media attention that has reminded them to try and get it off their bucket list.”

Harris and Extension/research associate Audrey Sheridan spearhead the MSU honeybee program and provide relevant, high-quality research and education to Mississippi’s beekeepers to help them maintain healthy hives and profitable businesses. Their research is supported by the Mississippi Agricultural and Forestry Experiment Station (MAFES).

Honeybee enthusiasts and professionals flock to the wide variety of Extension-sponsored classes, including beekeeping camp. The camp is a 5-day intensive workshop for adults and children that teaches hive setup, pest management, queen rearing, and harvesting and selling bee products. One-day classes help participants learn beginning beekeeping basics, as well as intermediate and advanced beekeeping tasks, such as colony splitting and queen rearing.

Queen rearing is an important aspect of beekeeping. Producers who learn this advanced technique can replace lost colonies and grow their businesses.

“Becoming a really good beekeeper means understanding that perhaps a 15 to 25 percent loss of colonies every year is the reality of modern beekeeping,” Harris said. “This is true even if a beekeeper is really good with the husbandry of bees, because diseases and hive pests have made it harder to keep bees healthy. Learning how to split hives for growing new colonies of bees and how to produce queen honeybees should be the goal of every beekeeper so they can be self-sufficient.”

Beekeepers who learn to breed their own queens save money and can control the quality of their hives. They also can supply other hobbyists and commercial operations, Harris said. Selling queen bees is one of the main lines of income for commercial beekeepers in Mississippi. One queen bee sells for $25 to $32. People who raise queens can also make small starter colonies of bees—called “nucs.” Each nuc, which includes a queen and some worker bees, sells for $125 to $145. Other revenues come from selling honey and wax and providing pollination services to crop producers all over the country.
Combating Colony Losses through Research

Most beekeepers battle varroa mites and small hive beetles every year. These pests are the two biggest challenges Mississippi honeybee producers face, Harris said.

Varroa mites pass viral diseases to the bees, causing large bee losses. Although strong hives can handle small hive beetles, weakened and dying colonies are destroyed. The beetle larvae eat developing bee brood, honey, and pollen, leaving behind a slime that can ruin honey and prevent adult bees from returning to the hive.

Currently, good hive management and control of varroa mites is the best defense against small hive beetles, which often attack colonies weakened by the mites, Harris said.

Harris aims to give Mississippi beekeepers another tool for managing both pests with his honeybee-breeding program at MSU. The program produces varroa-sensitive-hygiene (VSH) honeybees that can detect varroa mite infestations in their hives and remove affected pupae by cannibalizing them or removing them from the hives.

“In the process of removing their own family member from the nest, the hygienic bees kill the offspring of the varroa mite that was feeding on the developing bee pupa,” explained Harris. “We believe the mother varroa mite survives the ordeal, but her offspring are all killed. The net result is that pure VSH honeybees will actually lose mites over periods of weeks to months. I know of no other line of bees in which this occurs.”

Harris and other scientists produced the first VSH bees about 15 years ago when Harris worked with the U.S. Department of Agriculture’s Agricultural Research Service. Harris continued his work with VSH bees when he became the MSU bee specialist 4 years ago.

“During each year over the life of this breeding endeavor, we will produce queens from VSH breeder queens that were selected as the best performers from the previous year,” Harris explained. “We will raise daughters from them and use instrumental insemination to make crosses among the daughters of various breeders. These daughter queens will be used in our field colonies for a season, and the best ones from that year will become the breeder queens for the subsequent generation in the following year.

“This is why breeding is so painfully slow,” he added. “The queens are selected based on how well their colonies perform during a typical field season. How much honey did they make? Did they sting a lot? And most importantly, did they keep populations of varroa mites low and at nondangerous levels? It takes time. Years.”

Harris and his team also want to know what genes are controlling the bees’ hygienic behavior so that they can keep a broad genetic base for breeding and maintain the bees’ performance.

“Our goal is to produce a high-quality VSH stock that provides nearly 100 percent protection from the mite in the state of Mississippi,” Harris said.

MSU bee specialist Dr. Jeff Harris aims to give Mississippi beekeepers tools for managing varroa mites and small hive beetles. (Photo by Kevin Hudson)
Supporting Monarch Butterflies

A simple quest to find a few native milkweed species that would do well in Mississippi’s coastal landscapes turned into an obsession for Pat Drackett, director of the MSU Crosby Arboretum in Picayune.

“In the spring of 2015, we had a lot of questions from gardeners about what kind of milkweed they should plant to help support monarchs and where to get it,” Drackett said.

Monarch butterfly populations have dwindled more than 80 percent in the last 10 years because of declining habitat in their breeding and overwintering areas.

Milkweed provides a place for these butterflies to lay eggs and is the only food source for monarch caterpillars. The plant, a member of the *Asclepias* genus, is not readily available on the market, Drackett explained.

“I thought I would do a little research to find out how many species of *Asclepias* occur in Mississippi,” she said. “What I found after consulting with field botanists was that there are about 15 native species found throughout the state, and about six of them appear to have promise for wider use in home gardens. But it’s difficult to find them in the

“Native milkweed is a critical component for monarch conservation, but it is also a great nectar producer in general. It is a good source of nectar for bees, wasps, and other pollinators, as well.”

— Pat Drackett
trade. Most nurseries don’t sell them, and the most commonly available *Asclepias* species—tropical milkweed—is sometimes mislabeled as a native species.”

Monarchs like tropical milkweed and will use it. However, research at the University of Georgia suggests that this species may entice adult monarchs to overwinter in the U.S., when they should be migrating to Mexico. Adult monarchs that stay too long can become infected with a debilitating parasite that can make them sick or kill them.

“Nonnative milkweed can be managed by cutting it back to stubble before monarchs begin the fall migration,” Drackett said. “But I also think we should be helping our clients learn about native species and provide more habitat for these butterflies.”

In an effort to help homeowners identify the best native species for their landscapes, Drackett began a seed trial of nine native milkweed species in 2016 at the MSU South Mississippi Branch Experiment Station in Poplarville. She obtained seed for the trial primarily from out-of-state commercial sources.

Drackett developed a poster that depicts each of these *Asclepias* species and the habitats they prefer. The poster can be viewed on

### Building Pollinator Habitat

Like all living things, pollinators need food, water, and shelter to survive.

People who want to attract a diverse selection of pollinators should grow a diverse mix of plants that provide nectar throughout the year, said Dr. Gary Bachman, an Extension horticulture specialist and Mississippi Agricultural and Forestry Experiment Station researcher. Trees and shrubs are also important because they provide shelter for the pollinators.

“In general, landscapes with a variety of plants and water will attract a variety of pollinators,” Bachman said. “But if people want a certain species, they should do a little homework to see if that species requires a specific plant for breeding, overwintering, or feeding.”

Bee houses, whether purchased from commercial sources or made from leftover wood, can be placed strategically to encourage native bees to nest. For native bees that nest in the ground, Bachman said property owners can leave some land unplowed, especially along a wooded edge.

Water sources can include ponds, puddles, and birdbaths. Fountains or other water features with pumps can keep water moving and help control mosquito populations, Bachman added.

“Winter and spring are critical times for insect pollinators,” Bachman said. “Food sources can be sparse during these seasons. Be sure to include plants that will provide nectar in these two seasons.”

Plants such as kale and cabbage can provide a lot of forage for bees on warmer winter days, and they make stunning landscape displays, Bachman said.


### Other Helpful Resources
- MSU Extension county offices
- MSU Extension-sponsored Master Gardener groups
- Monarch Joint Venture at [monarchjointventure.org/resources/downloads-and-links](http://monarchjointventure.org/resources/downloads-and-links)
- Xerces Society at [www.xerces.org/pollinators-southeast-region/](http://www.xerces.org/pollinators-southeast-region/)
the Monarch Joint Venture website at monarchjointventure.org/resources/downloads-and-links by clicking on Milkweed Resources on the left. She plans to release an Extension Service publication with more detailed information in 2016.

Drackett said she expects several native milkweeds to excel in the study: aquatic milkweed, tall green milkweed, butterfly weed, whorled milkweed, green antelopehorn, and swamp milkweed. Results of the trial will be presented at the 2016 Fall Field Day at the South Mississippi Branch in October.

A second trial is planned for 2017 with seed obtained from milkweed species growing at the Crosby Arboretum and in other areas of Mississippi.

Gardeners who want to plant native species should educate themselves about milkweed and monarch conservation, Drackett said. The best and most economical way to acquire native species is to grow the plants from seed at home and share plants with other gardeners.

“Native milkweed is a critical component for monarch conservation, but it is also a great nectar producer in general,” she said. “It is a good source of nectar for bees, wasps, and other pollinators, as well.”

A Variety of Pollinators
Monarchs and honeybees are just two of many known species of insect pollinators in Mississippi. About 400 species of native bees pollinate crops and wildflowers in the state.

Entomologists and bee enthusiasts are collecting more data on native bees in the Southeast through the Southern Bee Biodiversity Initiative. The initiative invited Dr. Blair Sampson, a research entomologist with the USDA Agricultural Research Service, to participate because of his expertise in solitary bees and the support his lab can provide.

“We don’t have a firm number for Mississippi,” Sampson said. “Four hundred is just a rough estimate, but this initiative should help us learn about more species.”

Eleven new native bee species were identified in the Eastern U.S. in early 2016, and more species remain to be discovered in the Southeast, Sampson said. There is still much to be learned about the number of native bee species in Alabama and Mississippi. Other Southern states included in the initiative are Virginia, South Carolina, Georgia, and Louisiana.

These new species join others, such as Southeastern blueberry bees, bumblebees, and squash and pumpkin bees. Many native bee species have special relationships with one type of plant or a few particular plant species.

“Southeastern blueberry bees visit only a few types of plants,” Sampson said. “Without these bees, these plants would not be pollinated. Bumblebees are generalists and will visit a large variety of plants. Plants that produce male and female blooms, such as squash and pumpkins, must be visited by pollinators to make fruit.”

Although bees are the most abundant pollinators, butterflies, moths, and some flies can pollinate plants by transporting pollen sacks that get stuck to their bodies during feeding. Other species, including bats, hummingbirds, and reptiles, also serve as pollinators. Some pollen is moved by wind and water.

By Susan Collins-Smith
“To see these women come out of their shells and feel more comfortable is an accomplishment for me.”

— Kim Gowdy
When MSU Extension Service agent Kim Gowdy began teaching parenting skills classes to Hispanic immigrants, she had just one challenge: Gowdy does not speak Spanish.

“My audience for these classes is all Spanish-speaking women,” said Gowdy, who is based in the Harrison County Extension office. “I have an interpreter who translates for me, and when I have presentations, she will make the slides in Spanish, and then translate what I say.”

Xenia Wickline, a community advocate with El Pueblo in Biloxi, directs the Mujeres Unidas (Women United) program, which includes Gowdy’s audience.

“I was trying to build a program for these ladies to offer support and help make them independent,” Wickline said. “When Kim came to us and told me what she could offer, we just clicked. Now, we’ve been working together almost 5 years.”

Mujeres Unidas is a community organization that helps immigrants overcome barriers such as language, culture, and isolation. The women come from nearly all the Spanish-speaking countries south of the U.S. border, and most of them have endured extreme hardship.

“People in our group have come to the U.S. walking through the desert, some have survived human trafficking, and many are victims of domestic abuse,” Wickline said. “Most of the ladies are both mom and dad to their children, and some deal with deported husbands or family members.”

Gowdy’s classes, which are usually held twice a month, meet at St. Paul United Methodist Church in Biloxi. Topics include parenting, stress management, financial literacy, nutrition, and sewing.

“In the sewing class, we made shopping buggy covers,” Gowdy said. “Most of them can’t speak English and didn’t know how to use a sewing machine.”

Despite these obvious challenges, Wickline never has a shortage of participants in the yearlong program.

“One reason the ladies like this group is because the time is for them,” Wickline said. “They feel like they are free to talk about everything with us, so we laugh and cry together.”

Women who participate in the program have not had many educational opportunities in the past, so classes are designed to meet some of their basic needs for knowledge.

“One lady had a son who was bullied in class, but she didn’t know her son was a victim of bullying,” Wickline said. “She found out using a technique that Kim taught, and she was able to go to her son’s teacher, and now her son is better.”

Another woman learned that emotional abuse is part of domestic abuse.

Sessions are tailored to meet the needs of each class of women, and a graduation ceremony wraps up the program.

“Those who attend the most classes are selected as valedictorian and salutatorian,” Gowdy said. “We have a real graduation ceremony with caps and gowns and diplomas, and we invite their families and friends to attend.”

“The valedictorian and salutatorian have to give speeches,” she said. “Many of them have never graduated high school, so this program is an opportunity for them to graduate and feel that accomplishment. When they’re giving their speeches, I have no idea what they’re saying, but I’m so moved, I feel like crying with them.”

Wickline said the women regularly talk about how the classes have impacted their lives.

Fabiola Morales, a current class member from Mexico, has lived for a year and a half in Gulfport. Her husband’s job in Pascagoula brought them to the Gulf Coast. Morales heard about Mujeres Unidas when she went to El Pueblo for help getting a student visa for her son.

“I have support in the group Mujeres Unidas,” Morales said. “I feel good when I go there and talk about my problems. Sometimes you need to talk to somebody who speaks your own language. We do many things. I have fun, and they help me.”

Rosa Bender, originally from Peru, has lived in the U.S. for more than 30 years, the last 11 of which were in Biloxi. She has participated with Mujeres Unidas for more than a year.

“I am 55 years old,” Bender said. “My kids are grown and married, and I have seven grandkids and one great-granddaughter. I lost my husband about 5 years ago. When I feel terrible about my aloneness, I visit them. I made friends, and Kim is so sweet—such a nice and kind person. That is why I still go over there.”

Gowdy won an Extension Award for Customer Outreach in 2015 for her work with Mujeres Unidas, and she enjoys the ongoing interaction with these clients.

“Some women repeat the program, but there are always new ones coming in,” Gowdy said. “To see these women come out of their shells and feel more comfortable is an accomplishment for me.”

By Bonnie Coblentz • Photos by Kat Lawrence
Agriculture is Mississippi’s largest industry, and it takes more than a village to keep it functioning and prospering—much more.

“Mississippi’s land grant and the state’s department of agriculture have been working hand-in-glove since our earliest days,” said Dr. Greg Bohach, MSU vice president for agriculture, forestry, and veterinary medicine. “We are available for each other as we promote and support all facets of agriculture in our state.”

Bohach described their efforts as a two-way street that enables representatives from MSU and the Mississippi Department of Agriculture and Commerce (MDAC) to do their jobs.

“The MSU Extension Service is located in all 82 counties to provide information and guidance for a variety of agricultural businesses,” he said. “Our Extension specialists and Mississippi Agricultural and Forestry Experiment Station researchers serve as vital resources as the state Department of Ag and Commerce oversees industry needs.”

Bohach pointed to relationships with the Mississippi State Chemical Laboratory and the MDAC Bureau of Plant Industry. The chemical lab falls under the MSU umbrella, and the bureau belongs to MDAC, but both are based on campus. He also noted other connections, such as livestock shows and farmers’ markets.

Dr. Ashli Brown has appointments with the Mississippi Agricultural and Forestry Experiment Station and the College of Agriculture and Life Sciences, but she spends most of her time as the state chemist and director of the chemical laboratory, which is one of MSU’s separately budgeted units.

“The lab’s No. 1 client is the Mississippi Department of Agriculture and Commerce,” she said. “Neither of us could do our jobs effectively or efficiently if the other did not exist and we didn’t work together.”

Brown said the laboratory works with MDAC to analyze commodities such as feeds, fertilizers,
“Our mission—to promote the state’s products while protecting consumers, as well as the agricultural and horticultural interests in the state—would be hampered if we could not assure quality and address problems quickly. Agriculture greatly impacts our economy and touches the lives of every Mississippian, making it imperative that we protect the integrity of the industry.”

—Cindy Hyde-Smith

MDAC Commissioner Cindy Hyde-Smith said quick and accurate responses are a priority for her department.

“Our mission—to promote the state’s products while protecting consumers, as well as the agricultural and horticultural interests in the state—would be hampered if we could not assure quality and address problems quickly,” she said. “Agriculture greatly impacts our economy and touches the lives of every Mississippian, making it imperative that we protect the integrity of the industry.”

With 37,000 farms covering almost 11 million acres, agriculture is the No. 1 industry in Mississippi. It employs almost 30 percent of the state’s workforce and brings in more than $8 billion annually.

Hyde-Smith said her department also works closely with MSU to promote farmers’ markets and livestock shows.

“Whether the influence comes from serving on advisory committees or boots-on-the-ground activities, we rely on Extension and MAFES researchers to help us serve Mississippi,” she said. “We are especially pleased with the growth in farmers’ markets, which provide growers and consumers with a convenient market for locally grown products. Through their leadership at many markets and their educational guidance provided to growers, Extension agents play a key role in the success of farmers’ markets.”

Dr. James Barnes, an associate Extension professor in agricultural economics, said MDAC helps fund the Mississippi Bricks to Clicks Extension Program, an entrepreneurship initiative that teaches farmers and farmers’ market managers how to market food hubs using social media.

“We rely on MDAC’s farmers’ market directory to help us connect with them and help develop markets for food and other products available at farmers’ markets,” Barnes said. “It’s all about promoting local food production and consumption, and that can translate into improved regional economic development.”

After the Mississippi Farmers’ Market on High Street in Jackson adopted the practices taught in the Extension program in 2015, MDAC saw a 43 percent increase in attendance during their market on June 11, 2015, compared to the same event in 2014.

“The big difference was the use of Facebook marketing ads and content posted onto the Jackson market’s Facebook page,” Barnes said. “Also, MDAC surveyed the farmers who participated on June 11 and found that 63 percent of those surveyed reported sales increased by 15 percent or more.”

Next year, MDAC will provide Extension with another grant to provide this training program for all Mississippi farmers and farmers’ market managers.

Lincoln County Extension agent Rebecca Bates said the farmers’ market in Brookhaven is in its ninth season. MDAC’s certification of the market 8 years ago indicated that food products are prepared following food-safety regulations.

“The MDAC certification opens up a lot of doors for us,” Bates said. “We benefit from their promotional activities and the MDAC nutrition program for senior adults. Seniors qualify for vouchers that they can use to purchase fresh fruits and vegetables at the market.”

Bates said MDAC provides farmers’ market managers with workshops on topics such as social media and food safety.

“It has been great to see the market expand from 1 day a week to 2 days and for the attendance to continue to increase,” she said.
New research techniques learned at Mississippi State University through a scholar exchange program will help a cattle veterinarian from Egypt as she pursues a doctorate in food safety.

Sousanah Ezzat Riad of Cairo spent 2 months with experts in the MSU Department of Food Science, Nutrition, and Health Promotion learning techniques to isolate and identify foodborne pathogens that affect food safety and consumer health. Riad recently completed a Master of Veterinary Science degree at Alexandria University and is now a veterinarian for the Egyptian government.

MSU hosted Riad through the U.S. Department of Agriculture Foreign Agricultural Service’s Scientific Exchange Scholars Program. This program promotes food security and economic growth by increasing scientific knowledge and collaborative research to improve agricultural productivity.

Participants learn new research techniques and gain exposure to scientific developments in various fields of agriculture. They also visit other fully equipped laboratories and libraries during their stay.

Riad’s work dealt primarily with the detection of *Salmonella*, *E. coli*, and *Staphylococcus* in various food products.

“My research focus for my master’s degree was in milk products, so I worked exclusively with those,” she said. “Here, I got to branch out and apply what I’ve learned toward other products, including fish, meats, and poultry, to find acids and bacteria while learning some new research techniques that are not familiar in Egypt.”

Dr. Juan Silva, a scientist with the Mississippi Agricultural and Forestry Experiment Station, mentored Riad while she studied at MSU.

“Our goal was to enhance what she knew and show her new techniques in detecting pathogens using the technology we have in our labs,” Silva said. “I gave her some information on the potential problems that stem from the use of raw milk in making products. We gave her some guidance on what we have here, and some of the things we do and don’t recommend.”

Techniques Riad learned at MSU included DNA separation, detection, and quantification. Commonly referred to as real-time polymerase chain reaction (PCR), the process allows for detecting foodborne pathogens such as *Salmonella*, *Listeria monocytogenes*, and pathogenic *Vibrio* bacteria in various foods and their processing environments.

“Using real-time and conventional PCR methods, among other biochemical and immune assay techniques, she was able to learn DNA preparation and electrophoresis techniques for detecting the target foodborne pathogens so she could learn more about their characteristics in sensitivity and specificity,” said Dr. Taejo Kim, a former researcher with the Mississippi Agricultural and Forestry Experiment Station. “These are detection techniques used by scientists with the USDA and U.S. Food and Drug Administration on a regular basis.”

Dr. Rick Nader, associate vice president for international programs at MSU, noted that the university has hosted scholars through this and another USDA scholar program in consecutive semesters.

“The process of bringing a rising scientist in another country to MSU through the Scientific Exchange Scholars Program dates back to 2013,” Nader said. “This, along with the Norman E. Borlaug research fellowship, is an extremely competitive program. It was well worth the effort to get Sousanah on the MSU campus. Collaborating with her is a very important part of our mission of strengthening trade relations with other countries.”

This program may not be Riad’s last experience with Starkville. She is considering pursuing her doctorate at MSU.

“It was a great opportunity to learn about some processes that are used here and to be able to take this information back home and teach it to others there,” Riad said. “There are a lot of things I learned that will be helpful for me in my career. I was fortunate to see a large range of research activity here, and I am thankful for the experience.”

By Nathan Gregory • Photo by Kevin Hudson
County seat: Aberdeen
Population: 35,827
Municipalities: Amory, Aberdeen, Smithville, Nettleton (south), Hatley
Communities: Athens, Bartahatchie, Becker, Bigbee, Hamilton, Gattman, Greenwood Springs, Prairie, Egypt, Muldon, Strong, Splunge, Quincy, Wren, Westville
Commodities: corn, soybeans, peanuts, cotton, wheat, beef, dairy, poultry, catfish, forestry
Natural resources: waterway, oil, wildlife, fishing, hunting, hardwood forests, pine plantations, horticultural crops
History notes: Named for President James Monroe, Monroe County was the first county in north Mississippi and is one of the oldest counties in the state. At the time of its formation in 1821, there were only 13 other counties, all clustered along the Gulf Coast and the lower Mississippi Valley. Monroe County is still one of the largest counties, ranking eighth in the state by land area—772 square miles.
Did you know? With very recent additions to the National Register of Historic Places, Monroe County has more than 270 historic structures—a priceless treasure. The oldest intact church building is St. John’s Episcopal Church on East Commerce Street, which was completed in 1853.

“Monroe County has many historical places to see, but the true treasures here are the people. It is home to some of the finest people in the world, who work hard to preserve its future.”

Randal Nevins, MSU Extension County Coordinator

Editor’s note: 1/82 is a regular feature highlighting one of Mississippi’s 82 counties.
Dr. Jack D. Smith, a board-certified theriogenologist, is the new associate dean for academic affairs at the College of Veterinary Medicine. An MSU alumnus, Smith joined the CVM faculty in 2002 as a theriogenology resident and became an assistant professor 2 years later. In 2010, he was named director of clinical education. Smith received a doctor of veterinary medicine degree from MSU in 1999. Prior to returning to MSU, he worked in private clinical practice in Georgia. Under Smith’s leadership, the MSU veterinary college has implemented new student-outcomes assessment measures. In his new role, he is responsible for oversight and management of areas ranging from student recruitment to outcome-assessment data reporting of all veterinary graduates.

Forestry professor Dr. Stephen C. Grado received Phi Kappa Phi’s Love of Learning award for his dedication to the education profession and the society. PKP is the nation’s oldest and most selective honor society. A monetary award accompanied the tribute and is intended to help support professional development opportunities of faculty members. Grado said he will use the award to attend the 2017 International Society of Forest Resource Economists’ meeting in New Orleans. At the MSU Forest and Wildlife Research Center, Grado’s primary research areas include multiple-use forest management, outdoor and forest recreation, and wildlife economics.

The American College of Theriogenologists (ACT) named Dr. Richard Hopper, CVM pathobiology and population medicine professor, its 2016 Theriogenologist of the Year. This distinction, the highest honor awarded by the group, recognizes theriogenologists for their contributions to the discipline of veterinary medicine focusing on reproduction. Hopper is among many members of the ACT who promote animal well-being, reproductive health, and responsible breeding practices. He has nearly 40 years of professional career service in reproductive veterinary medicine, having joined the MSU faculty in 1993 after operating his own practice for 15 years.

The National Association of Landscape Professionals Academic Excellence Foundation named MSU landscape architecture associate professor Dr. Tim Schauwecker its 2016 Outstanding Educator of the Year. He was presented with the prestigious national teaching award in his “own backyard” when MSU recently hosted the 40th Annual National Collegiate Landscape Competition. The Educator of the Year Award recipient, nominated by a peer, is an individual whose passion, dedication, and hard work have contributed significantly to education in the landscape industry.

Dr. Roberto Gallardo, associate Extension professor in the Extension Center for Technology Outreach, recently published Responsive Countryside: The Digital Age and Rural Communities in both Kindle and paperback formats. The book was written to help rural elected officials, business owners, and residents better grasp the implications of the digital age. It also discusses an Extension-driven process to help communities transition to, plan for, and prosper in the digital age.

The MSU Child Development and Family Studies Center recently received accreditation from the National Association for the Education of Young Children. This certification is the mark of excellence for those in early-childhood education. Director Melissa Tenhet said the multiple-year process involved meeting 10 program standards that not only examined how the School of Human Sciences center operates from within, but also looked at the center’s interactions with parents and the surrounding community. The center is in the College of Agriculture and Life Sciences.

Dr. Allison Gardner, director of the MSU-CVM Veterinary Medical Technology Program, was listed as one of the Top 40 veterinary technology instructors by Vet Tech Colleges, a website that provides information about the field to interested students. The organization recognized her as a leading mind in the field and referenced her special interests in animal behavior, equine studies, and veterinary technology education. Veterinary technicians and technologists must successfully complete a veterinary technology program, and the CVM 4-year undergraduate program attracts students from all over the country.
Scientists in the Mississippi Agricultural and Forestry Experiment Station released a new rice variety to help growers meet global demand for the crop. Thad, named after U.S. Senator Thad Cochran, has excellent milling qualities and gives growers one more option to sell in the international rice market. Nearly half of all rice produced in the U.S. is exported, so Mississippi farmers need rice variety options to ensure strong foreign demand for their harvests.

Dr. Heath King, an MSU-CVM assistant clinical professor, was named one of the Top 40 Under 40 by Farm Journal Media. This award recognizes leaders under the age of 40 in the industry who show innovation in agriculture—including agronomy, agricultural equipment, animal and crop production, food and nutrition technology, and biotechnology and university research. King was recognized for his passion for teaching both general reproduction classes and more advanced classes involving hands-on development of clinical and surgical skills.

MSU has joined a new initiative dedicated to helping farmers better control, manage, and maximize the value of the data they collect every day in their fields. The Agricultural Data Coalition (ADC) is the result of years of planning and coordination by AGCO, the American Farm Bureau Federation, Auburn University, CNH Industrial, Crop IMS, The Ohio State University, Mississippi State University, the University of Nebraska-Lincoln, Raven Industries, and Topcon Positioning Group. ADC’s goal is to build a national online repository where farmers can securely store and control the digital information collected by their tractors, harvesters, unmanned aerial vehicles, and other devices.

The Oktibbeha County Heritage Museum’s SuperUse Pavilion, a part of the museum’s rain-garden program that has benefitted from the efforts of more than 100 MSU undergraduate and graduate students, recently was selected for exhibition at the Cooper Hewitt, Smithsonian Design Museum in New York City. The exhibition, which will open in late September, features 60 design projects from every region of the U.S. The SuperUse Pavilion’s selection recognizes the efforts of MSU students studying architecture, art, building construction science, graphic design, landscape architecture, and landscape contracting who designed and built the museum’s new event and exhibition pavilion.

Jesse D. Newton of Eupora, a fashion design and merchandising major in the College of Agriculture and Life Sciences, is the first-place winner in the 2016 New Orleans Fashion Week student designer competition. The rising senior entered a silver and white outfit pairing an asymmetrical jacket and skinny-leg pants. Newton, an MSU President’s List Scholar, said his winning entry originally was for a class in which members were required to create a miniature collection over the semester.

MSU’s Bass Fishing Club currently is ranked No. 1 nationally in the race for Cabela’s School of the Year title. Under the leadership of club president Jeff Roman Clayton IV, a junior forestry/wildlife management major from Theodore, Alabama, the team has a commanding 20-point lead in the competition sponsored by the Association of Collegiate Anglers. It is followed by teams from the University of Alabama and Bethel University. Cabela’s Collegiate Bass Fishing Series is considered the largest participatory collegiate tournament circuit in the country.

Morgan E. Von Staden, a senior food science, nutrition, and health promotion student from Olive Branch, has been named president-elect of the Institute of Food Technologists Student Association. She will hold a 3-year term on the international food science organization’s board of directors. The organization includes 66 student chapters within the United States and Turkey. While on the board, Von Staden will assist in planning the student portion of the IFT’s Annual Conference, an event that draws nearly 20,000 people each year. The IFT Student Association also hosts student quiz-bowl and product development competitions, which address large-scale food issues such as world hunger and poor nutrition in developing countries. (Photo by Erica English)
For several years, the Mississippi Poultry Association (MPA) and its Mississippi Poultry Foundation have had great success working with the state’s leading research university. This valuable partnership has been a major benefit to Mississippi State University and has helped to promote the state’s thriving poultry industry.

By increasing its educational support at MSU, the Poultry Foundation is providing more opportunities for aspiring poultry scientists. The organization recently contributed a $25,000 gift to establish the Mississippi Poultry Foundation Endowed Scholarship in the MSU Department of Poultry Science.

The increased support comes as part of a recent decision by the Poultry Foundation Board of Trustees to quadruple the number of scholarships the organization awards. Board members reached this decision because they recognized the burden of the rising costs of attending college, as well as the need to recruit more young people into the poultry industry.

The foundation serves as MPA’s philanthropic arm and as an advocate for the state’s poultry industry, which currently ranks fifth in national broiler production. Since its founding in 2005, the foundation has contributed significant support toward student scholarships. In addition to scholarships, the organization has also contributed to other key areas at MSU, including faculty awards and program enhancements.

“Poultry is Mississippi’s largest agricultural industry, and we are proud to encourage the hard work of the industry’s future leaders while they are pursuing their educations,” said Mark Hickman, Mississippi Poultry Foundation Board chairman and CEO of Peco Foods Inc.

The Mississippi Poultry Foundation Endowed Scholarship will be awarded to full-time poultry science students. Candidates must maintain a 3.0 grade-point average and have demonstrated leadership ability and financial need. The perpetual gift will ensure essential support for future students.
In addition to endowing a new scholarship, the foundation is also enhancing its existing scholarship support for the Department of Poultry Science and increasing support for the MSU Extension Service’s 2016 4-H Poultry Chain Competition.

Currently, the foundation supports four scholarships—two for MSU poultry science students and two for MPA grower members’ children or grandchildren. These awards will be increased from $1,500 to $4,000 beginning in the 2017 academic year.

In the 4-H Poultry Chain Competition, which culminates at the Mississippi State Fair, elementary and high-school students compete to raise chickens. MPA currently provides $2,500 to support the event but will increase this amount to $3,000 for the 2016 competition. MPA also is creating a $1,000 scholarship that will be awarded to the top-ranking, high-school senior competitor, provided that the student plans to pursue a poultry science degree at MSU.

“Mississippi State University and our Department of Poultry Science are extremely grateful for the Mississippi Poultry Foundation’s continued support, which provides more opportunities for aspiring students who will soon lead the agricultural industry,” said Dr. George Hopper, dean of the College of Agriculture and Life Sciences.

The Department of Poultry Science is one of only six degree-granting programs in this field in the United States. Supporting the state’s largest agricultural commodity, the department has achieved 100 percent placement of graduates since awarding its first degree in 1948.

With more than 28,000 people directly employed in Mississippi poultry production, the industry’s continued strength is critical. By partnering with MSU and investing in the university’s mission to provide quality research and top-notch graduates for future leadership roles, MPA is helping to further economic development and education within our state, ensuring a bright future for poultry producers.

Scholarships are needed for talented students in all fields at Mississippi State University. Donors may build perpetual endowments for scholarships and create ways for the university to harness the talents of students and educate them to become tomorrow’s leaders. Generous gifts to support their education will help these students have a lasting impact on our world.

“Scholarships are a rewarding investment and help make a Mississippi State education accessible to students of all financial backgrounds,” said Jud Skelton, director of development for the College of Agriculture and Life Sciences. “Contributions for scholarships enable Mississippi State to attract students and assist them in making their chosen career paths possible.”

A minimum gift of $25,000 is needed for a scholarship endowment, but gifts of any amount can benefit students annually. Scholarship support is part of the university’s ongoing Infinite Impact capital campaign.

For more information about creating scholarships through the Department of Poultry Science in the MSU College of Agriculture and Life Sciences, alumni and friends may contact Skelton and Will Staggers, the college’s assistant director of development. Individuals may also explore giving opportunities at Mississippi State by requesting a copy of the university’s “Guide to Giving” at www.msufoundation.com.
Mississippi State Trial Garden personnel are raising funds to research succulents. They hope to increase knowledge of these popular plants for both commercial growers and consumers. See https://accelerate.msstate.edu/project/2407 for more information on the project. (Photo by Kevin Hudson)